African Water Laws:
Plural Legislative Frameworks
for Rural Water Management in Africa

an international workshop

26-28 January 2005
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Objectives, definitions and issues

Barbara van Koppen, John Butterworth, and Ibrahim Juma with Faustin Maganga, Jim Latham, Claudious Chikozho and Mike Morris

This paper aims to present objectives of the workshop and review key definitions and issues based upon a rapid overview of all the submitted papers.

Workshop African Water Laws

Objectives, Definitions and Issues

Barbara van Koppen, Ibrahim Juma,
and John Butterworth
With inputs from Faustin Maganga, Jim Latham,
Claudious Chikozho, and Mike Morris

Workshop Working Hypothesis

- Water development and management by Africa's majority is governed by customary institutional arrangements
- These arrangements work well in many, but not all, respects
- Yet, state policy, law, and administration tends to ignore, if not disrupt customary arrangements
- Ongoing reform offers opportunities to tap the strengths of customary arrangements, avoiding its weaknesses

Objectives of the workshop - 1

This workshop aims at:

1. Better understanding the **existence** and **effectiveness** of customary water arrangements for rural livelihoods

Objectives of the workshop – 2

2. Identifying the range of options for statutory arrangements to better **recognize** customary arrangements for effectively contributing to rural livelihoods

Objectives of the workshop - 3

3. Formulating conclusions and recommendations for
   - policy dialogue
   - implementation (e.g. training)
   - further research/publication and curriculum development

Customary arrangements Existence and effectiveness - 1

- rural communities, cultural identity, worldviews, legitimacy, traditional leadership, sense of ethnicity, oral
- holistic management of natural resources including water, self-help and reciprocity
- effective enforcement and civilized conflict resolution at lowest possible level

Customary arrangements
Existence and effectiveness - 2

- flexible, adaptive to shocks and changes, locally appropriate
- areas of jurisdiction often localized (yet: migration, transhumance, upstream-downstream)
- hierarchies/accountability, gender, age

Customary arrangements
Existence and effectiveness - 3

- context: predominance in rural Africa, globally least formalized (water) economy
- evolution, impacts urbanization, literacy, religion, etc ?
- local government: negotiated co-existence re-emergence, contest/ overlap, dwindling?

Customary arrangements
Existence and effectiveness: water-1

- integrating uses, users, and sources, within cosmology
- livelihood-oriented water development with incentives to invest
- life-oriented sharing of god-given common resource
- water authorities, committees, functional groupings

Customary arrangements
Existence and effectiveness: water-2

- hierarchies, e.g. gender
- increased pressure on available water resources
- limited access to technologies, mid-term credits, range of other factors for enterprise development
- limited awareness of upstream-downstream

Formal

state
statutory policies, law, administration
custodian of the nation's water resources

two roles

- investor in hydraulic mission: increasing the pie
- regulator: sharing a limited pie (workshop less focus on quality issues)

Formal – hydraulic mission

Investor in infrastructure development

- colonial era: colonial minority
- independence: majority, esp. domestic uses
- IWRM: 'nation-wide, year-round water scarcity', so stifling water development for productive uses; ongoing domestic water development

Formal - regulator

Water use authorization

- colonial era: expropriation by minority
- independence: state property - dormant
- IWRM: revival property issue to expand to rural areas through registration-cum-authorization-cum-taxation; basin institutions

Formal – to redress inequities

Exception South Africa

- hydraulic mission: domestic and productive water development for 'Historically Disadvantaged Individuals'
- regulator in stressed areas
  - taking water from the haves to allocate to the have-nots through compulsory licensing
  - taxation for self-financing, cross-subsidization
- 19 basin institutions: state-steered participatory democracy

Formal recognition - generic

- systematic design and implementation of complementary roles at nested levels
- principles (e.g. CDD World Bank)
  - priorities of rural communities and their local governments as basis
  - integration e.g. multiple use water, other factors
  - subsidiarity: self-planning and implementation
  - financing stream downwards, fiscal strength
  - simplification bureaucracies
  - staff incentive structures to improve accountability downwards, etc.

Formal recognition - hydraulic mission -

Role government at local level

- support (technical, financial, institutional, empowerment of marginalized) for storage and abstraction technologies

Role government at basin level

- informing and ensuring (?) access to basin/aquifer water resources

Formal recognition - regulator at local level - 1

Examples role government in local conflict management (dry season):

- 'nested arbiter' at highest customary tier and lowest formal tier
- codification into formal law/bye-laws (stifling? removing safety nets for poorest?)
- bottom-up participatory water management
- formalizing proportional shares of dry season flows over river stretches

Formal recognition - regulator at local level - 2

Impact of formal permits ?

Administration

- "cadastre disaster" of registering many scattered, remote, illiterate users
- transition, forever, phased ?
- only existing collectivities?

Formal recognition - regulator at local level - 3

Impact of formal permits - ctd ?

Effectiveness
- inadequacy permit information (sites, volumes in annual averages, if available)
- enforcement of upper ceiling impossible
- corruption-prone

Formal recognition - regulator at local level - 4

Impact of formal permits - ctd ?

Effectiveness
- criminalizes (!) all non-registered users
- distorts customary arrangements
  - ownership contested
  - confusion, forum shopping
  - 'I paid, so I can use'

Formal recognition - regulator at local level - 5

Impact of formal permits - ctd ?

Effectiveness
- compatibility with role as nested arbiter ?
- discourages investment in storage

Formal recognition - regulator at basin level - 1

Impacts of permits: aggregate local problems ?

Water resources planning
- information value of registration
- unpacking 'water scarcity' by area and season 'problemsheds'

Formal recognition - regulator at basin level - 2

If stress and zero-sum allocation: government's political choice

- Recognizing customary and/or small-scale uses for compensation, if taken away or sold
- Prioritization by sector / people
- Allocating future water development

Formal recognition - regulator at basin level - 3

Implementation alternatives to permits
- Blanket prioritization or authorization
  - to areas/groups
  - below thresholds
    colonial legacy of 'allocating' to the colonial labor power to survive ? Human rights? Democratic equal rights for all ?
- Other measures: legal aid, strategic links, effective devolution

Formal recognition - regulator at basin level - 4

Basin institutions

- line agencies restructuring lower tiers for productive uses
- limited role for local government
- more limited for customary arrangements
- separating regulation and hydraulic mission, marginalizing itself ?

Formal recognition - regulator at basin level - 5

Fee payment

- Logistics of collecting fees among many small users gives net losses
- Large users willing to pay, independently from permits
- Compatibility financing streams upwards to basin level and downwards and fiscal autonomy ?

Conclusions

Customary arrangements are majority issue and quite effective for livelihoods

Formal recognition through complementary roles as:

- Investor in unfinished rural hydraulic mission
- Regulator at local level
- Regulator at basin regulation where needed
- Distinguish registration from authorization from fee payment

Thank You
and
Wishing You Fruitful Debates

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The New Institutional Economics of India's Water Policy

Tushaar Shah

Much institutional analysis in the water sector at national as well as global levels has focused principally on the working of law, policy and administration of water sector—the three pillars of water institutions. In New Institutional Economics, these constitute the IE (IE) of the water economy, which is distinguished from institutional arrangements (IA). The latter are humanly imposed 'rules in use' that govern the behavior of water users and producers, and dealings between them. Water User Associations, pump irrigation markets, fishery co-operatives and contractors, urban tanker water markets are examples of institutional arrangements (IA). NIE's central concern about 'why economies fail to undertake appropriate activities if they had a high pay-off' is of great interest to actors in the IE —governments, NGOs, donors, policy makers, legislators, local administrators. These therefore have views about and keen interest in shaping IA to improve the working of the water economy. In this paper, we explore issues involved in unleashing performance-enhancing change in IA's.

Keywords: New institutional economics, irrigation, India

Introduction

The paper offers three overarching propositions:

- First, IA's prevailing in a country's water sector depend on the degree of its formalization, which in turn is determined by the overall development of the national economy. In mature economies, where water sectors are highly formalized, water policy, law and administration are able to bring into their ambit all or most water transactions. In poor and emerging national economies, in contrast, the water sectors are predominantly informal; here water policy, law and administration have a limited reach, except in urban pockets and rapidly industrializing regions. As a result, the only way players in the IE can improve the performance of water economy is by designing indirect instruments of influencing the IA's in the water sector.
- Second, whether or not institutional and policy initiatives/reforms produce intended effect depends on the balance between attendant pay-offs and transaction costs. And several kinds of institutional reform tried or suggested in the Indian water sector have either entailed high transaction costs or low pay-offs or both. In contrast, and more interestingly, IA's changes which have quietly and spontaneously occurred because pay-offs are high and transaction costs low are either ignored or even discouraged or, at least, not built upon by players in the IE.
- Finally, whether a new IA emerges, sustains, disappears, mutates, succeeds or fails often depends critically on the posture adopted by players in the IE. Herein lie the opportunity for fostering performance enhancing reforms in water sector IA's.

Institutional Arrangements and Institutional Environment

A recent review of institutional changes in global water sector in 11 countries by Saleth and Dinar (2000) deal with water law, water policy and water administration, as the three pillars of institutional analysis in national water economies. This focus on law, policy and organizations as central themes of institutional analysis has been the concern of many analysts of water resource management (see, e.g., Bandaragoda and Firdausi 1992; Merrey 1996; Frederickson and Vissia 1995; Holmes 2000; Saleth 2004). However, if institutional change is about how societies adapt to new demands, its study needs to go beyond what government bureaucracies, international agencies and legal/regulatory systems do; people, businesses, exchange institutions, civil society institutions, religions and social movements—all these must be covered in the ambit of institutional analysis (see, e.g. Mestre 1997 cited in Merrey 2000:5; Livingston 1993).

In an effort to build upon existing institutional analysis of Indian water sector, this paper takes this broader view in attempting a preliminary analysis of water institutions in India, if anything because it helps us access the vast field of New Institutional Economics (NIE) in analyzing ways Indian society is responding to its changing water situation. We begin right away by borrowing from North (1990) the notion of institutions as 'formal rules, informal constraints (norms of behavior, conventions, and self-imposed codes of conduct) and the enforcement characteristics of both'; and also the notion that 'if institutions are the rules of the game, organizations are the players'. It is also useful to borrow the important distinction drawn in the NIE between *institutional arrangements* (IA's) and *institutional environment* (IE). Thus aspects that Saleth and Dinar (2000), include in their 'institutional analysis' represent, mostly, IE in NIE except for the operating levels of IE (irrigation department *chawkidars,* operators of public tubewells) which sometimes interact closely with IA's .*Institutional arrangements* (IA's), in contrast, 'are the structure that humans impose on their dealings with each other' (North 1990). In the particular context of the Indian water economy, then, when we refer to IE, we include various government agencies at different levels that directly or indirectly deal in water, international agencies, governments' water policy, water related laws, and so on. And in talking about *institutions* or *institutional arrangements* (IA's), we refer to things like groundwater markets, tubewell co-operatives, water user associations, Rajendra Singh's *johad* movement in Alwar (CSE?), groundwater recharge movement in Saurashtra (Shah 2001), tank fishery contractors in Bundelkhand (Shah 2002), emergence of defluoridation plants in cottage sector in North Gujarat's towns (Indu 2002), and such like.

We begin with three propositions: [a] water institutions of nations at any given point in time depend critically upon the level of *formalization* of water economies; by formalization, we mean the proportion of the economy that comes under the ambit of regulatory influence of the IE [1]; [b] in this sense, water sectors are highly informal in primitive economies, and become more formalized as national economies grow; [c] the *pace* of water sector formalization in response to economic growth varies across countries and is determined by a host of factors, including likely the degree of population pressure on land and water resources, extent of dependence on farming for livelihoods, macro-economic policies, the nature of the 'State' (principally, how hard or soft it is). How much difference these make in the pace of formalization of water sectors is difficult to say; however, it is clear that India can not have Europe's level of formalization of its water sector at its present state of economic evolution.

The level of formalization of a country's water sector is best indicated by the low level of interface between its water IA's and its water IE—or by what North (1990) calls the 'transaction sector'[2] of the water economy. Informal water economies are marked by heavy dependence of water users on self-provision (through private wells, streams, ponds) or informal, personalized exchange institutions, community-managed water sources, absent or limited use of price or user charges to recover costs of service provision or resource use, or to guide resource allocation or to clear markets. In contrast, in highly formalized water economies, as in Europe and North America, self-provision disappears as a mode of securing water service; all or most users are served by service providers—private-corporate, municipal or others—who form the interface between users and the institutional environment. Volumetric supply and economic pricing are commonly used in highly formal water sectors for cost recovery as well as resource allocation. Here, water emerges as an industry.

Just how informal India's water economy is was explored by a large nation-wide survey NSS 54th round of survey (NSSO 1999, report 452:46) carried out in June-July 1998. It is based on interviews with 78990 rural households in 5110 villages throughout India to understand the extent to which they depend upon common property (and government) land and water resources for their consumptive and productive uses. It showed that only 10% of water infrastructural assets used by survey households were owned and managed by either a public or community organization; the rest were mostly privately owned and managed by households or owned by government/community but *not* managed by either.[3] If receiving domestic water from 'tap' is an indicator of getting connected to a public water supply system, the same survey also showed that over 80% of rural households self-supplied their domestic water needs, and were not connected with any public or community water supply system. In urban households (sample =31323 households), the situation was the opposite; 3/4th were connected to a public water supply system. A somewhat different 2003 survey (NSSO 2003: report 487) showed that of the 4646 villages covered, only 8.8 percent had a public/community water supply system; people living in the rest depended on wells or open water bodies for domestic water supply to rural households.

A strong imprint of economic growth was evident too. The proportion of villages with public water supply system increased rapidly as we move from a poor state like Bihar, where none of the 364 villages covered had a public/community water supply, to Haryana where over half the villages had public water supply system, and to Goa where every village surveyed had a public water supply system.

Irrigation economy too is equally informal. The 1999 survey of 48419 cultivators throughout India showed that nearly 65% of them used irrigation for Five Major Field Crops cultivated by them; and, for nearly half of them, the source of irrigation were informal, fragmented pump irrigation markets (NSSO 1999:42) which are totally outside the ambit of direct influence of water law, policy and administration. The 2003 survey of 4646 villages (NSSO 2003: report 487) showed that 76.2% of the villages reported they irrigated some of the lands; but only 17.3% of the villages had access to a *public* irrigation system; the rest depended primarily on wells and tubewells (64.3%), tanks and streams. All these surveys suggest that rural India's water economy—both domestic and irrigation use—is highly *informal,* based as it predominantly is on self-supply and local, informal water institutions; it has little connect with public systems through which water law, policy and administration typically operate.

Contrast this picture with a recent account by Louis-Manso (2004) of the highly formalized water economy of Switzerland. 70% of its population is urban; the country is facing continuous reduction in industrial workers and farmers. Probably 15-20% of the Swiss population was linked to public water supply as far back as in the 18th century; today, 98% of the Swiss population is linked to public water networks and 95% is connected with waste-water treatment facilities. Switzerland spends 0.5% of its GNP annually in maintaining and improving its water supply infrastructure; and its citizens pay an average of CHF 1.6 per 1000 liters of water (CHF =0.786 US $). Per capita water bill Swiss pay annually is around CHF 585 which is higher than the per capita total income of Bangladesh. All its water users are served by a network of municipal, corporate, co-operative water service providers; it has stringent laws and regulations about water abstraction from any water body which can be done only through formal concessions. However, these concessions are held only by *formal* service providing public agencies; as a result, their enforcement entails little transaction costs

Much discussion on the water problems of developing countries like India—and the IA's needed to solve these—arguably give too much importance to their water endowments and their characteristics. A good deal of this discussion also ends up advocating water sector IA's (such as tradable water rights in Chile, or tradable salinity credits as in the Murray-Darling basin or farmer associations managing irrigation systems as in Turkey or Columbia) or organizations (such as the Murray Darling River Basin Commission) to countries in Asia and Africa where national water economies are still predominantly informal.

We suggest that water institutions that exist in a country or can be externally catalyzed depend, besides several other factors, on the stage of formalization of its water economy which in turn depends upon the overall economic evolution of that country as outlined in figure 2. Water IA's we find in India, Pakistan and Bangladesh—such as, say, pump irrigation markets, urban tanker water markets--are unlikely to be found in Australia or Spain because they would serve nobody's purpose there. Likewise, water IA's that are standard in industrialized countries—multinationals managing a city's water supply system--would not begin to work until Dhaka as a water service market evolved, at least, to Manila's or Jakarta's level[4].

The Process of Institutional Change

In understanding how societies adapt their institutions to changing demands, Oliver Williamson (1999) suggests the criticality of four levels of social analysis as outlined in Figure 3. The top level is referred to as social embeddedness level where customs, traditions, mores and religion are located. Institutions at this level change very slowly because of the spontaneous origin of these practices in which 'deliberative choice of a calculative kind is minimally implicated.' The second level—where the IE of a society is involved—evolutionary processes play a big role; but opportunities for design present themselves through formal rules, constitutions, laws, property rights; the challenge here is getting the rules of the game right. The definition and enforcement of property rights and contract laws are critical features here. Also critical is the understanding of how things actually work-'warts and all' in some settings, but not in others.

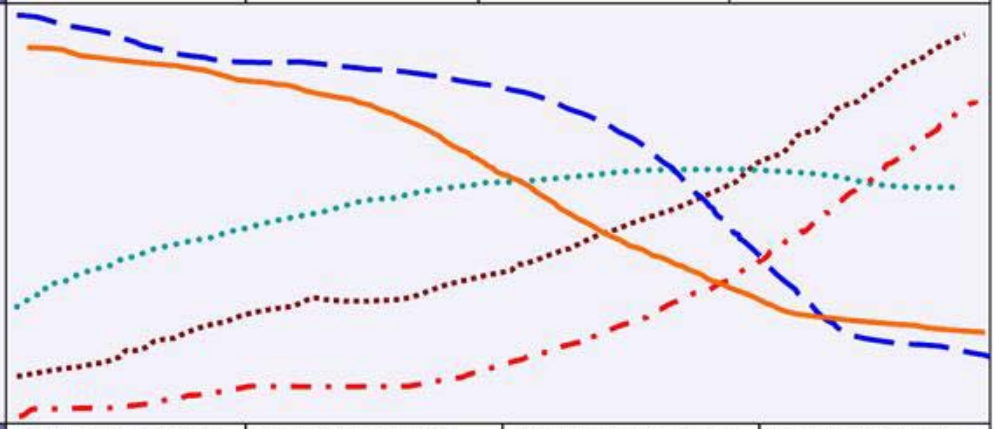
	Stage I: Completely Informal	Stage II: Largely Informal	Stage III: Formalizing	Stage IV: Highly Formal Water Industry
% of water users in the formal sector	<5%	5-35%	35-75%	75-95%
Examples	Sub-Saharan Africa	India, Pakistan, Bangladesh	Mexico, Thailand, Turkey, Eastern China	USA, Canada, Western Europe, Australia
Dominant mode of water service provision	Self-supply and informal mutual-help community institutions	Partial Public Provisioning but self-supply dominates	Private-public provisioning; attempts to improve service and manage the resource	Rise of modern water industry; High intermediation; self-supply disappears
Human, technical and financial resources used by water sector % of total water use self-supplied Rural population as % of total Cost of domestic water as % of per caput income Cost of water service provision				
Concerns of the Governments	Infrastructure creation in Welfare Mode	Infrastructure and Water services, especially in Urban areas	Infrastructure and service in towns and villages; Cost recovery; Resource protection	Integrated mgt. of water infrastructure, service and resource; Resource protection
Institutional Arrangements	Self-help; mutual help and feudal institutions dominate	Informal Markets; Mutual help and community management institutions	Organized service providers; self-supply declines; informal institutions decline in significance	Self-supply disappears; all users get served by modern water industry.

Figure 1. Transformation of informal water economies in response to overall economic growth

However, it is one thing to get the rules of the game (laws, policies, administrative reforms in the IE) right; it is quite another to get the play of the game (enforcement of contracts/property rights) right. This leads to the third level of institutional analysis: transaction costs of enforcement of contracts and property rights, and the governance structures through which this is done. Governance—through markets, hybrids, firms, bureaus--is an effort to craft order, thereby to mitigate conflict and realize mutual gains; and good governance structures craft order by reshaping incentives, which leads to the fourth level of social analysis—getting the incentives right.

From the viewpoint of policy analysis for action, it is also useful to recognize that institutional changes at L1 and L2 levels would be economy-wide, encompassing all aspects of social and economic life of a society. For the particular purpose of analyzing water sector institutions, therefore, we must regard L1 and L2 almost as given[5]. This may seem trite but sectoral interventions aiming to achieve at least L2 level changes[6] are not uncommon. Discussions on institutional changes needed in the water sector often refer to reorienting the bureaucracy or modifying property rights in water; but it is virtually impossible to enduringly[7] transform *only* the water bureaucracy while the rest of the bureaucracy stays the same. All things considered, it is practical to leave L1 as given; L2 as amenable to change at the margins; and L3 and L4 can be taken as the relevant playing field for institutional reform in the immediate run.

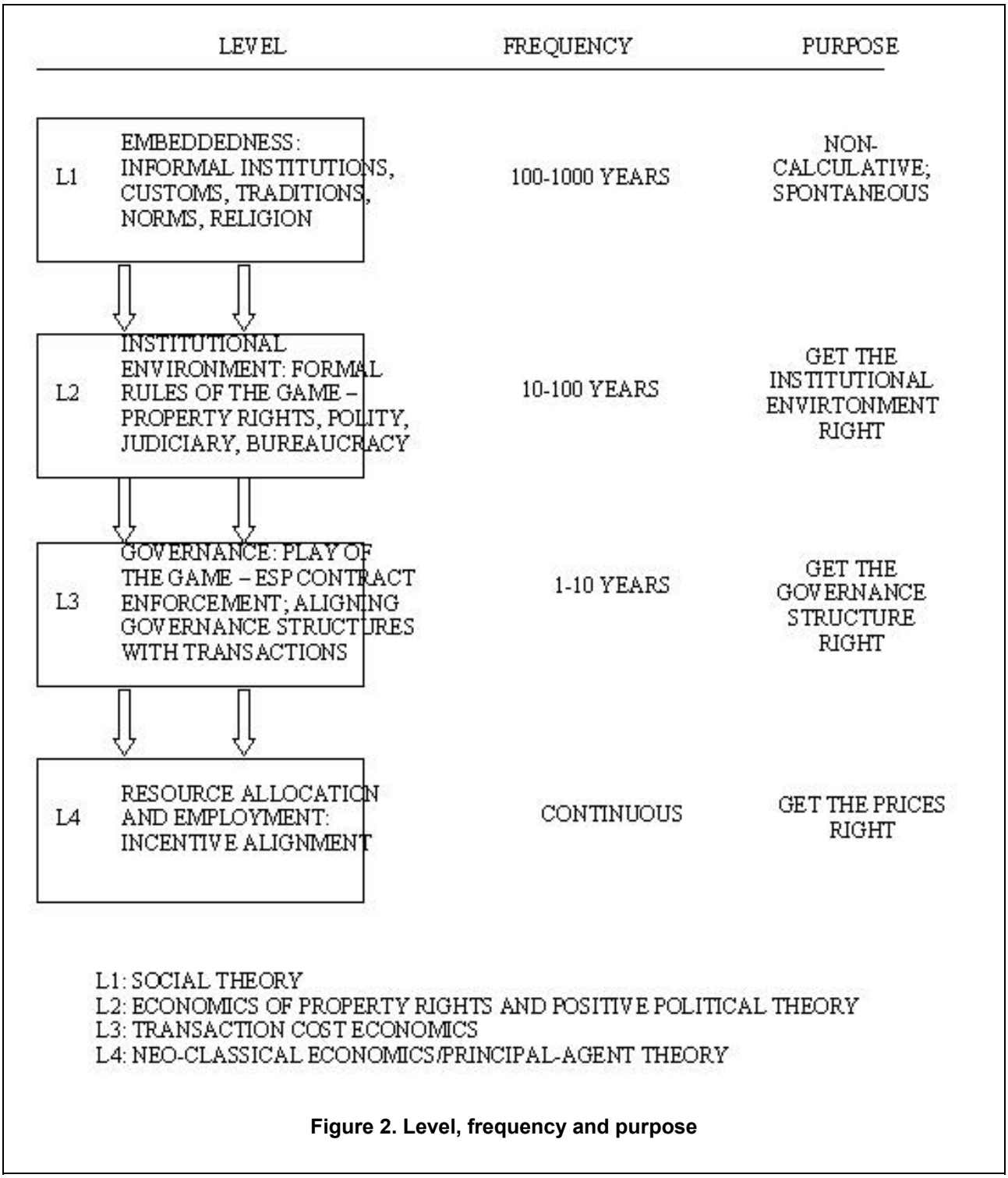


Figure 2. Level, frequency and purpose

In NIE, the most interesting aspect of study of institutional change is about 'why economies fail to undertake the appropriate activities *if they had a high pay-off*' (North 1990). India's water sector is replete with situations where appropriate activities can potentially generate a high pay-off and yet fail to get undertaken; in contrast, much institutional reform being carried out will likely not work because it entails high transaction costs and low pay-off.

In analyzing the Indian institutional experience in the water sector, our key propositions are embodied in the 'payoff-transaction cost matrix' in figure 4. Several kinds of institutional reform tried or contemplated have

either entailed high transaction costs (quadrants 2) or low pay-offs (quarter 4) or both (quarter 3). In contrast, changes in IA's which have quietly occurred because pay-offs are high *and* transaction costs low (quarter 1) are either ignored or even discouraged or, at least, not built upon. In the following sections, we briefly analyze a sample of situations in each of these four quarters in figure 4 before drawing some general implications arising from this analysis.

		Transaction costs	
		Low	**High**
Pay offs	**High**	• Bounded service provider; • Gujarat's Public tubewell transfer • Intelligent management • of farm power supply • Private RO plants+clean water vouchers for the poor. • Decentralized groundwater recharge movement in Saurashtra **1**	• Participatory Irrigation Management • Community RO plants • Fishery co-operatives **2**
	Low	**3** • Andhra Pradesh Water and Trees Law • GoI Water Policy 2002 • Maharashtra Drinking Water Protection Act	**4** • Community regulation of groundwater overdraft; • Metering farm power supply

Figure 3. Payoff-Transaction cost matrix of IAs

Low Transaction Costs, Low Pay-offs

The experience of industrialized countries had led to a persistent demand for a modern legislative and policy framework for orderly and effective management of the water economy and sustainable husbanding of the resource. However, in a predominantly informal water economy such as India's, the transaction costs of enforcing a water law effectively are so high that these attempts have had to remain cosmetic, essentially setting 'targets without teeth'. Indeed, laws and policies are often written to minimize transaction costs by progressively removing clauses that bite and are likely to be extensively violated, thereby reducing the *effective* regulatory powers of a law. When this is not done, decision makers responsible for enforcement shy away. The Model Groundwater Law developed by the Government of India in circa 1970 is a case in point; it has been tossed around for 35 years across state capitals but there have been no takers. Gujarat assembly passed the law; but the Chief Minister decided not to gazette the act in view of high transaction costs of enforcing it.[8]

But other chief ministers were less transaction-cost-savvy. So in 1993 Maharashtra made a law with a limited ambition of disabling irrigation wells within 500 meters of a Public Water Source during droughts with a view to protecting drinking water wells. 10 years after its enactment, IWMI-Tata Program studied the enforcement of this law (Phansalkar and Kher 2003). The law provides for stern action against violation but gets invoked only when a 'Gram Panchayat files a written complaint' (which, at one stroke, reduces to a fraction the transaction costs as well as the potency of the law). The study found numerous cases of violations of the 500 meter norm,

yet not a single case of legal of action resulted because Gram Panchayats failed to file a written complaint. It concluded that, "There is a near complete absence of social support for the legislation. The rural lay public as well as the office bearers of *Gram Panchayats* appear inhibited and reluctant to seem to be "revengeful" towards those who are doing no worse than trying to earn incomes by using water for raising oranges." Instead of invoking the law, supply side solutions in the form of upgraded drinking water facilities and water tankers during droughts, are preferred by people, Gram Panchayats as well as Zilla Parishads. IWMI also did a quick assessment of the Andhra Pradesh Water and Trees Act (Narayan and Scott 2004), [9] and concluded on a similar pessimistic note. A similar exercise has been the formulation of official GoI Water Policy of 1987 and 2002. Both these pieces are an excellent example of bland enunciations which are *not* designed to change anything in any manner[10]. As a result, they have low transaction costs, but also no pay-off.

Low Pay-offs, High Transaction Costs

Other widely espoused proposals entail high transaction costs and promise doubtful benefits at least in the prevailing circumstances. A very good example is the effort to introduce volumetric pricing of electricity supply to groundwater irrigators. It was the high transaction costs of metering over a million irrigation pump-sets—which involved installing and maintaining meters, reading them every month, billing based on metered consumption of power, but more importantly, of controlling pilferage, tampering with meters with or without collusion with meter readers, etc—that obliged State Electricity Boards (SEBs) to switch to flat tariff during the 1970's. Flat tariff succeeded in reducing transaction costs of serving a market where derived demand for electricity was confined to periods of peak irrigation requirements. It would have been a viable system if SEB's had learnt to ration power supply to agriculture and gradually raise the flat tariffs to break-even levels. However, neither happened; farmer lobbies have managed all along to prevent upward revision in flat tariff while compelling the SEB's to maintain electricity supply to the farm sector. The invidious nexus between energy and irrigation—which has contributed to the bankruptcy of the Indian power sector and rampant over exploitation of groundwater—has been discussed in Shah, Scott, Kishore and Sharma (2004).

In the thinking of SEB's and multilateral donors about ways out of this imbroglio, returning to metering power is critical, even if it means taking on farmer lobbies. Several chief ministers have tried to bite the bullet in the past few years, but farmers' opposition has been so strong, swift and strident that they have been either felled or obliged to retract. Some, as in Andhra Pradesh and Tamilnadu, have done away with farm power tariff altogether. Recommending metering farm electricity in today's setting is asking politicians to do hara-kiri. But even if a politician were to succeed in metering farm power supply, it would likely change little because if anything, transaction costs of metered power supply are much higher today than they were in the 1970's. Most states have at least 8-10 times more irrigation tubewells today than they had during the 1970's; and farming livelihoods depend far more critically on electricity today than 30 years ago. If metering must work in India, we must learn from the Chinese experiments which have focused on modifying the incentive structures (see Shah, Giordano and Wang 2004).

Surprisingly, the electricity-irrigation nexus is not a subject of discussion in China at all. The Chinese electricity supply industry operates on two principles [a] of total cost-recovery in generation, transmission and distribution at each level with some minor cross-subsidization across user groups and areas; and [b] each user pays in proportion to his metered use. Unlike in much of South Asia, rural electricity throughout China was charged at a higher rate than urban; and agriculture paid more than domestic and industrial use until a few years ago (Wang et al 2004). Until 1997, the responsibility for O & M of the village electricity infrastructure and user charge recovery lay with the Village Committee. The standard arrangement in use was for the Village Committee and the Township Electricity Bureau to appoint and train one or more local farmers as part time village electrician with dual responsibility, of maintaining the power supply infrastructure in the village as well as collecting user charges for a transformer assigned to him/her based on metered individual consumption from all categories of users. The sum of power use recorded in the meters attached to all irrigation pumps has to tally with the power supply recorded at the transformer for any given period. The electrician is required to pay the Township Electricity Bureau for power use recorded at the transformer level.

This arrangement did not always work easily. Where power supply infrastructure was old and worn out, line losses below the transformer made this difficult. To allow for normal line losses, 10% allowance is given by the

Township Electricity Bureau to the electrician. However, even this must have made it difficult for the latter to tally the two; as a result, an Electricity Network Reform program was undertaken by the National Government to modernize and rehabilitate rural power infrastructure[11]. Where this was done, line losses fell sharply[12]; and among a sample of villages I visited, none had a problem tallying power consumption recorded at the transformer level with the sum of consumption recorded by individual users, especially with the line-loss allowance of 10%.

It is interesting that the village electrician in Henan and Hebei provinces in North China is able to deliver on fairly modest reward of Y 200-250/month plus incentive bonus of around Y 200/month (Zhang 2004) which is equivalent to the value of wheat produced on 1 mu (or $1/15^{th}$ of the value of output on a hectare of land). For this rather modest wage, China's village electrician undertakes to make good to the Township Electricity Station full amount on line and commercial losses in excess of 10% of the power consumption recorded on the transformers; if he can manage to keep losses to less than 10%, he can keep 40% of the value of power saved. This generates powerful incentive for him to reduce line losses. In the way the Chinese collect metered electricity charges, it is well nigh impossible to make financial losses since these are firmly passed on downstream from one level to the next. Take for example the malpractice common in South Asia of end-users tampering with meters or bribing the meter-reader to under-report actual consumption. In the Chinese system, it is very unlikely that such mal-practices can occur on a large scale since the village electrician is faced with serious personal loss if he fails to collect from the farmers electricity charges for at least 90% of power consumed as reported at the transformer meter. And since malpractice by a farmer directly hits other farmers in the village, there likely exist strong peer control over such practices. In making metered power pricing work, China's unique advantage is its strong village level authority structure. The Village Committee, and especially, the Village Party leader, is respected and feared. These ensure that the electrician is able to do her job. In comparison to China's Village Committees, India's *Village Panchayats* are utterly devoid of power as well as authority as institutions for local governance.

In India, similar experiment is being tried out in Orissa where private companies in charge of distribution first experimented with Village *Vidyut Sangha'*s (Electricity Co-operatives) by forming 5500 of them but are now veering around to private entrepreneurs as electricity retailers. Mishra (2004), who carried out an assessment of Orissa reforms for IWMI-Tata program visited a number of these *Sangha's* during 2003 and noted that 'none of the Village Committees were operational.." These worked as long as the support organization hired to catalyze them propped them up with constant visits and organizational work; as soon as the support organization was withdraw, the Village *Vidyut Sangha*'s became defunct. Mishra (2004) wrote, "The situation today is quite similar to that [which] existed earlier before the interventions were made through the Committee". *Sangha's* having failed, power distribution companies appointed three private entrepreneurs as franchisees on terms similar to those facing China's village electricians. These have resulted in sustained and significant improvements in billing and collection of electricity dues.

The Orissa experiment and the Chinese experience suggest that, in principle, it is possible to make volumetric pricing and collection of electricity charges work if private entrepreneurs were appropriately incentivized. However, in Orissa, the electricity use in agriculture is less than 5%. If the same arrangement were to work in Punjab, Haryana or Gujarat or several other states where electricity use in the farm sector is 30% or more, farmer resistance would be greater and commensurate with the effectiveness of the volumetric pricing. And one thing that private power retailers in Indian villages would have to do without is the authority of the Village Party Leader that helps China's village electricians to firmly pass on all costs to farmers. In the absence of such authority structures, private entrepreneurs would expect very high margins to assume the role of retailing power on a volumetric basis. This—as well as farmer propensity to frustrate metering—would raise transaction costs of metering very high. If the ultimate purpose of volumetric pricing is to improve the finances of electricity utilities, I doubt if this purpose would be achieved.

In a recent paper (Shah, Scott, Kishore and Sharma 2004), we have argued that, in making an impossibly bad situation better, a more practical course available to SEB's and state governments is to stay with flat tariffs but rationalize it through intelligent management of power supply. Farmers' needs for power are different from households' or industries'; they need plentiful power on 30-40 days of the year when crops face acute moisture

stress. However, in most states, they receive a constant 8-10 hours/day of poor quality power supply throughout the year. If SEBs were to invest in understanding farmers as customers, it should be possible for them to supply 20 hours/day of good quality power to farmers on 30-40 days of peak irrigation need while maintaining 3-4 hours/day supply on other days. In order for such an approach to work, the nature and capabilities of the power utilities have to change; so also does the thinking of donors and governments.

High Transaction Costs, Potentially High Pay offs

Rather than evolving organically from the unfolding situation on the ground—and therefore being demanded by stake holders-- many of the reforms currently being pursued in India, such as Irrigation Management Transfer, River Basin Management, metering of electricity, are actually promoted aggressively by researchers as well as funding agencies[13], and are sometimes out of sync with the prevailing Indian context. By far the most frequent are situations where institutional interventions proposed would yield high productivity pay-offs if successful; but they rarely succeed because of high transaction costs. In Independent India's history, the 'communitarian ideal'—the notion that villagers will instantly come together to take over the responsibility of participatory, democratic management of virtually anything (land, water, watersheds, forests, irrigation systems, river basins)—has been behind innumerable abortive institutional interventions. What has helped fuel this enthusiasm for participatory irrigation management by farmers are occasional examples of such models having worked reasonably well either in the industrialized countries or in India itself but under the tutelage of an inspired local leader or an industrious NGO. Its having worked in a few situations in exceptional conditions becomes the basis for designs of major programs of institutional interventions, commonly bank-rolled by an international donor. A classic example is Participatory Irrigation Management (or its cousin Irrigation Management Transfer) which has been, for the past four decades, the ruling *mantra* for improving the productivity of irrigation systems in India. What is extraordinary about this preoccupation with PIM (or IMT) is the sway it has continued to hold despite virtually no evidence of it having succeeded anywhere except on an experimental scale[14]. WUA's have been tried out on small irrigation systems since 1960. Uttar Pradesh tried *Sinchai Samiti's (*Irrigation Committees) way back in early 1960's on irrigation tanks and reservoirs; following it, Madhya Pradesh too tried it on thousands of its minor irrigation tanks. Other states have been trying to make *Pani Panchayats* (Water Assemblies) work. But *Sinchai Samiti's* of Madhya Pradesh and Uttar Pradesh have disappeared without trace; and so have *Pani Panchayats* in Gujarat and elsewhere. Yet, Orissa recently made a law that transferred all its minor irrigation systems to instantly-created *Pani Panchayats.* Gujarat introduced Joint Irrigation Management Program as far back as in 1983 but the 17 Irrigation Co-operatives lost money and became defunct. In 1991; it made another attempt, this time around with assistance from NGOs; and 144 Irrigation Co-operatives cover 45,000 ha of irrigated area(Shukla, 2004); however, it is difficult to see precisely in what way these areas are better off than other commands. Indeed, a core idea of Command Area Development Agencies (CADAs) in early 1980's was to involve farmer organizations in the management of irrigation projects; and we see no trace of CADA's or their Beneficiary Farmers' Associations (BFAs) including in Kerala where thousands of these were formed under a 'big bang' approach during 1986. An assessment by C J Joseph (2001) in late 1990's suggested that, even in this land of strong traditions of local governance, high education and high levels of people's participation, BFAs were damp squib[15]. *A la* Kerala, Andhra Pradesh overnight transferred the management of all its irrigation systems to over 10,000 WUAs created by fiat and a World Bank loan; this 'big bang' approach to PIM has attracted all-round interest; however, now that the World Bank funds retailed to WUAs for maintenance are over, field observers are beginning to wonder precisely what the WUAs are doing better (Jairath 2004)[16] .

The central assumption underlying PIM/IMT is that once irrigation management is transferred from remote bureaucracies to WUAs, financial viability of the systems would improve and so would the quality and reliability of irrigation; physical and value productivity of water and land would increase, and irrigation systems would better achieve their potential for food and livelihood security for farmers in their command. PIM/IMT programs have belied many of these expectations even in countries like Turkey, Mexico and Philippines where they are known to have succeeded. As a result, early expectations from PIM/IMT have been increasingly moderated and IMT is now considered successful even if it just 'saves the government money, improves cost effectiveness of operation and maintenance while improving, or at least not weakening, the productivity of irrigated agriculture' (Vermillion 1996:153). The drift of the IMT discussion, in recent times, then has been more towards getting irrigation off the back of the governments than towards

improving the lot of the farmers and the poor, the original goal to which much public irrigation investment was directed over the past 50 years.

Some over-arching patterns emerge from a reading of the international experience. IMT has tended to be smooth, relatively effortless and successful where the irrigation system is central to a dynamic, high-performing agriculture, where average farm size is large enough for a typical or a significant proportion of the command area farmers to operate like agro-businessmen; where farm producers are linked with global input and output markets, and where the costs of self-managed irrigation are an insignificant part of the gross value of product of farming. These are the conditions—all of which either enhance the pay-of or reduce transaction costs or both-- obtain in Mexico, USA, and New Zealand from where emerge the resounding success stories we hear about IMT[17] (Shah, van Koppen, de Lange, Merrey and Samad 2002). In South Africa—the commercial farming sector, which satisfies all these conditions, took naturally to PIM through Water Boards, which are WUA's par excellence; but the same logic when applied to irrigation systems serving small holders in former homelands met with resounding failure because these met none of the conditions that Water Boards satisfied.

Even where all conditions are satisfied, researchers have presented mixed picture on PIM/IMT impacts. An exhaustive global review done for IWMI of IMT impacts by Douglas Vermillion, a pioneer in IMT research, for example, showed that impacts are significant and unambiguously beneficial in terms of cost recovery in Turkey, Mexico, USA, and New Zealand. Fee collection has improved; agency staff strength has declined. But the impact of management transfer on agricultural productivity and farm incomes is far less unequivocal even in these countries (Vermillion 1996:153). In Philippines, the Mecca of IMT and PIM, recent studies show that productivity gains from PIM have not sustained (Pannela 1999).

None of the conditions outlined above obtain in a typical Indian surface irrigation system. Most farmers in the command have small holdings, sub-divided further in to smaller parcels. A typical major system has hundreds of thousands of small holders, making it well nigh impossible to bring them all together to negotiate. Over 90% of surface water irrigated area in India is under field-crops yielding Rs 15-18 thousand (US $ 325- 400) per ha of gross value of output, compared to US $ 3000-7500/ha in high value farming in industrialized countries. Irrigation systems are at the heart of the farming economy of command areas. However, the mushrooming of wells and tubewells, and booming pump irrigation markets in command areas and in the neighborhood of irrigation tanks have reduced farmers' stakes in managing surface irrigation systems. Head-reach and tail-end farmers almost always have opposing motivations when it comes to management reform, with the former interested in the preserving the status quo, and the latter interested in change. All these together raise the transaction costs of implementing management reform through PIM/IMT type interventions. The prospects become worse because almost everywhere, the agency's purpose in promoting PIM is to get WUA's to assume arduous responsibilities—maintenance, fee collection, etc. Moreover, farmers take little time to figure out that PIM often means increased water fee without corresponding improvement in service quality. These reduce the perceived pay-offs from reform.

All in all, decades invested in the hope that PIM or IMT would spearhead productivity improvements in public irrigation are decades wasted. PIM has not achieved any significant success on a meaningful scale anywhere in India. And it will indeed be a great surprise if it does in the existing IE marked by hopelessly low irrigation fees, extremely poor collection, and poor main system management.

There are similar institutional misadventures in other spheres. In growing regions where fluoride contamination of groundwater is endemic, governments and donors have tried setting up village based Reverse Osmosis type plants or Nalgonda-type defluoridation plants to control the growing menace of dental and skeletal fluorosis. Again, the management model chosen is communitarian; and these have invariably failed. In Gujarat, out of dozens of such plants set up during the 1980's and 1990's, not one has operated for more than a few months. An older experiment with communitarian model has been with inland fishery co-operatives. Numerous local water bodies controlled by irrigation departments, Zilla Panchayats, Taluka Panchayats and Gram Panchayats can potentially sustain a vibrant inland fishing enterprise and livelihoods system. However, government policy has always been to give away monopoly lease rights to registered fisher-people's co-operatives. Thousands of such co-operatives are registered; but probably a very small fraction—in my surmise, less than 1 or 2 percent—operate as dynamic producer co-operatives, like for instance, the dairy co-operatives do in Gujarat.

In South India, which has over 300,000 irrigation tanks, a decades-old concern has been about the break-down of traditions of maintenance of bund and supply channels, orderly distribution of water, and protection from encroachment. Several donor supported projects first aimed at 'engineering rehabilitation' and restored tank infrastructure to their original –or even better—condition. However, when rehabilitated tanks again declined and needed another round of rehabilitation, planners found something amiss in their earlier approach. Therefore, in new tank rehabilitation programs—such as the new World Bank project in Karnataka—an institutional component is added to the engineering component. But the institutional component invariably consists of registering a Water User Association of command area farmers. Except where such WUAs have been constantly animated and propped up by support NGO's—as in the case of Dhan Foundation in Madurai, Tamilnadu—it is difficult to find evidence of productivity improvements in tanks because of WUAs on any significant scale. Besides the problem of high transaction costs of co-coordinating, negotiating, rule-making and, above all, of rule enforcement, improving the management of tanks—more in North India than in South India—face some special problems. One of them is of aligning conflicting interests of multiple stake holders. Command area farmers have a direct conflict of interest with tank-bed farmers; and well owners in the neighborhood of tanks are a potential threat to all other users because they can virtually steal tank water by pumping their wells. Then, there are fishing contractors whose interests also clash with those of irrigators, especially during the dry season (Shah and Raju 2001). Registering a Water User Association of command area farmers and hoping that this 'institutional intervention' would increase productivity of tanks is naïve to the extreme. Improved management of public irrigation systems, tanks, and fishery—all represent opportunities for high pay off but have failed to get realized because the institutional models promoted have high transaction costs.

Low (or reduced) Transaction Costs, High Pay-offs

The core of New Institutional Economics is the notion that productivity of resources in an economy is determined by technology employed and institutions. And if 'institutions affect economic performance by determining transaction and transformation (production) costs', then Indian water sector is brimming with institutional changes occurring on the margins which are doing this all the time, and yet are either glossed over or frowned down upon by the IE. Most such institutions we explore in this section are invariably *swayambhoo* (self-creating); they have come up on a significant-enough scale to permit generic lessons; these invariably involve *entrepreneurial* effort to reduce transaction costs; they serve an important economic purpose, improve welfare and have raised productivity; and are commonly faced with adverse or unhelpful IE. Crucially, these are the *instrumentality* of the players of the game, and sustain as long as they serve their purpose.

The emergence of tube-well technology has been the biggest contributor of growth in irrigation in post-Independent India; and the spontaneous rise of groundwater (or, more appropriately, pump irrigation service) markets has done much to multiply the productivity and welfare impact of tubewell irrigation. The Indian irrigation establishment is probably out of touch with the changing face of its playing field. It still believes that only 38% of the gross cropped area is irrigated, 55% of it by groundwater wells. But the reality of Indian irrigation at the dawn of the millennium is that its tail has begun wagging the dog.[18] IE in the Indian water sector has little or no interface with 75% of Indian irrigation occurring through tubewells and the institution of water markets.

The working of groundwater markets is now extensively studied (Shah 1993; Saleth..; Jana Karajan, Singh 2004; Mukherji 2004 for a good survey of literature). These find and analyze myriad ways in which their working differs across space and time. But common elements of groundwater markets everywhere in the Indian sub-continent are the features we listed at the start of this section: they are *swayambhoo*, they operate on so large a scale as to account for over a quarter of Indian irrigated areas; water sellers every where constantly innovate to reduce transaction costs and create value; finally, they are the *instrumentality* of buyers and sellers of pump irrigation service, and not of society at large or the IE; as a result, water markets are unrepentant when their operation produces externalities such as groundwater depletion or drying up of wetlands. Finally, despite their scale and significance, the IE has been blind towards the potential of water markets to achieve policy ends. When they take notice of their existence and role—which is infrequent-- water policy makers are often unable to decide whether they are good or bad.

Much the same is the case with many water institutions. In the previous section, I mentioned tens of thousands of fishermen's co-operatives which are lying defunct; however, fishery entrepreneurs have sprung up everywhere which uses paper co-operatives as front for operating profitable culture fisheries. Why don't fisher co-operatives exploit the opportunities that these contractors are able to? The most important reason is the transaction costs of protecting the crop. Culture fishery is capital intensive but affords a high yield. In common property village or irrigation tanks, with multiple stakeholders, in order to remain viable, the fishermen should be able to effectively defend their rights against poachers, against irrigators who may want to pump tank water below the sill level during dry periods to irrigate crops or tank bed cultivators who want to empty the tank so they can begin sowing. Fisher communities are commonly from the lowest rung of the village society; they would not only have difficulty in mobilizing capital to buy seedling and manure but also in protecting the crop from poaching from outsiders as well as their own members. Reserving fishing contracts for fisher co-operatives is therefore the best formula for sustained low productivity of in-land fishery economy. Just how high the transaction cost of protecting a fish crop is was evident when my colleagues and I studied who precisely the fishing contractors are in two separate studies in central Gujarat and in Bundelkhand. We found that in both the regions, the key characteristic of people who emerged as successful fishing contractors was a painstakingly cultivated image of a toughie, or a ruffian capable of enforcing his rights even if by using violence. In Bundelkhand, "Everywhere the fishing contractors involved stopped farmers from lifting water from the tank once the last five feet of water was left. They had invested in fish production and now were making sure they get their money's worth." (Shah 2002:3). In central Gujarat, a fishing contractor had to kill a poacher and does a jail term to establish that he meant business when it came to defending his property right[19]. Despite this unsavory aspect, I would not be much off the mark in suggesting that the explosive increase in inland fishery in India during the past 40 years is the result of two factors: introduction of new technologies of culture fishery along with its paraphernalia, and gradual emasculation by the fishing contractor of the idealized fisher co-operatives as monopoly lease holders on water bodies. Had the co-operative ideal been enforced vigorously, India's inland fishery would not have emerged as the growth industry it has today.

How does changing policy-IE unleash productive forces in an economy is best illustrated by the evolution of Gujarat's inland fishery policy over the past 30 years (Pandya 2004). Following early attempts to intensify inland fisheries during the 1940's, Gujarat Government's Fisheries Department began supporting Village Panchayats to undertake intensive culture fishery in village tanks during early 1960. However, the program failed to make headway partly because of popular resistance to fish culture in this traditionally vegetarian state, and partly because of rampant poaching from local fisher-folk that *Village Panchayats* as managers could not control. In a modified program, the Department took over the management of tanks from the *Panchayats* to raise fishery on a produce-sharing basis; but the Department was worse than *Panchayats* in checking poaching. In 1973, a special notification of the GoG transferred in-land fishing rights on all water bodies, including village tanks, to the Fisheries Department which now set about forming fishermen's co-operatives in a campaign mode. The idea was to entrust the management to the community of poachers themselves. In Kheda district of Gujarat, for example, 27 such co-ops were formed to undertake intensive culture fishing. However, the co-ops were none the better when it came to controlling poaching including by their own members; and the gross revenues could not even meet the bank loans. Coop members lost heart; and coops became defunct, a story that has been endlessly repeated in various fields in India's history of co-operative movement. While all manner of government subsidies were on offer, what made culture fishery unviable were three factors: [a] a lease offered for only 3 years, a period considered too short to recoup the investment made; [b] only registered co-ops could be given lease and the process of registration was transaction-costly; and [c] rampant poaching.

All this while, culture fishery productivity was steadily rising; although the co-ops were not doing well, culture fishery was, as entrepreneurs began using co-ops as fronts to win leases. This entailed significant transaction costs; they had to pay off the office bearers of co-ops; they had to keep the Panchayat leaders in good humor so that their lease would be renewed. Even then, whenever a Panchayat's leadership changed, the new order would terminate the contract to favor a new contractor. This dampened the contractors' interest in investing in high productivity.

In 1976, the government began setting up Fish Farmers' Development Agencies in each district to implement a new Intensive Fish Culture Program. They began making changes in the terms of lease: private entrepreneurs

were, in principle, considered for giving away leases but there was a pecking order of priority: first priority was for a Below Poverty Line family, then to a local poor fisherman, then to a local co-operative, and if none of these were available, then to any entrepreneur who bid in an open auction. Earlier, the government paid a puny rental to the *Gram Panchayat*s for using them for fish culture; now that entrepreneurs were allowed, *Gram Panchayat*s began setting an off-set price derived as an estimate of the 'fishing value' of the tank, which was 20-30 times the rental Panchayats received earlier from the Department. Even so, as soon as leases were open to entrepreneurs, many came forward. A later change in policy gave co-operatives some discount in the 'upset price' and other benefits. In 2003, a series of new changes in the policy framework gave further fillip to productivity growth: the lease period was extended from 3 years to 10 years, which reduced the contractors' gullibility to changes in *Panchayat* leadership and also made investment in productivity enhancement attractive. The new policy also removed the last vestiges of special treatment to co-ops, and provided for a public auction of the lease after open advertisement.

During 1971-1998, inland fishery output of Gujarat increased six-fold from 14000 mt in 1971 to over 80,000 mt in 1998-99 (Govt of Gujarat 2004). Considering that Gujarat hardly had any culture fishery before 1950, it must be said that the credit for this growth rightly belongs to the government's efforts. Government invested in subsidies, organizing inputs, bringing in new technology, extension and training and much else. All these played a role in expanding the fisheries economy. However, perhaps, the most important impact has been produced by two factors: [a] the changes made at the margins in the leasing policies of water bodies that have shaped the transaction costs of setting up and operating a profitable culture fishery business; and [b] the high costs of controlling poaching, which has ensured that besides several entrepreneurial qualities, successful fishing contractors also have to acquire and deploy muscle power.

Several less sensational examples can be offered of spontaneous institutions that operate on a large scale to fulfill needs to serve which water establishments promote copybook institutions. I briefly mentioned earlier how hundreds of defunct community RO or defluoridation plants set up by governments to supply fluoride-free drinking water to village communities have failed under community management. However, in North Gujarat, as a demand curve has emerged for fluoride-free drinking water, some 300 plants selling packed water have mushroomed in the cottage sector; over half of these were set up after 2001, mostly in mofussil towns to serve permanent customers as well as retail water in polythene pouches.[20] The RO cottage industry of Gujarat was quietly serving a growing demand when the 'IE' caught up with it. In 2001, the Bureau of Indian standards made it compulsory for cottage RO plants to get ISI mark. This entailed that each plant had to invest Rs 0.3-0.4 million in an in-house laboratory and pay an annual certification fee of Rs 84,000. This single move put paid to the emerging RO water cottage industry; 200 operators had to close their businesses because the new announcement doubled their cost of production. Yet, setting up an in-house laboratory and paying annual certification fee implied no guarantee of quality assurance because BIS inspectors hardly visit plants if ever. Many customers Indu (2001) interviewed wondered if the ISI mark—like AGMARK ghee and honey—can by itself guarantee quality unless BIS itself put its act together in the first place.

Likewise, many state governments are struggling, in vein, to cut their losses from operating mostly World Bank funded public tubewell programs by trying to transfer these to *idealized* co-operatives. If the purpose of a co-operative tubewell is to enable a group of farmers to mobilize capital, to install and operate a tubewell for mutual benefit of members, such tubewell groups have existed for decades in North Gujarat. The difference is that, having been created to serve the purpose of their members, their ownership structure and operating rules are designed to minimize the transaction costs of cooperating on a sustained basis (Shah and Banerjee 1998). The Government of Gujarat tried hard to transfer its public tubewells to *idealized* co-operatives, but thanks to the very high transaction costs relative to the pay-off facing potential entrepreneurs, the program made no headway until 1998 when the terms of turn over were rewritten.[21] Basically, the requirement that a co-operative be registered under the Co-operative Act was dropped; the lease period was extended from 1 to five years; and changes were introduced which made it possible for one or few major stake holders to assume the role of tubewell manager and residual claimant. These minor changes suddenly gave a fillip to the program, and over a 3 year period, over half of Gujarat's public tubewells, some 3500 in all, were transferred to farmer groups. An IWMI-Tata study of turned over public tubewells (Mukherji and Kishore 2003) showed that within a year after

the turn over, the performance of tubewells, in terms of area irrigated, hours of operation, quality of service, O & M and financial results improved; two years after turn over, it improved dramatically.

In opening this section, I talked about the significance of groundwater markets in India's irrigation. However, private provision of water services is also an important part of India's urban reality. In an IWMI-Tata study of 6 cities—Indore, Jaipur, Nagpur, Ahmedabad, Bangalore and Chennai—Londhe et al (2004) found that municipal agencies supplied only 51% of the demand calculated at 80 lpcd. In Chennai and Ahmedabad, formal organizations served only 10% and 26% respectively of the 'normative' demand, the balance being either self-supplied or served by informal sector players. 'Tanker markets' supply 21, 12 and 10 percent respectively of the demand in Chennai, Indore and Jaipur. In Chennai, they have year round operations and have an association. In other cities, tanker markets emerge during the summer and quietly disappear as monsoon arrives. Londhe etal (2004) estimate that some 3000 tankers in the six cities operate a water trade worth Rs 203 crore/year. Despite being key players in urban water sectors, 'there is no record with any government department about its size, scale and *modus operandi.* There is absence of any government regulation on groundwater withdrawals. [Except in Chennai] in other cities. Authorities do not even acknowledge the existence of such markets.' (ibid). Tanker markets operate much like any market, and serve those who can pay for their services. The IWMI-Tata study estimated that 51% of consumers in the six cities are from high income groups, 43% from middle income groups and only 6% from low income groups. Contrary to widely held belief that the poorest pay the highest for water, the IWMI-Tata study showed the poorest pay the lowest even when transaction costs and imputed cost of labor and time in fetching water are factored in (Londhe et al 2004).

One more case of institutions that 'planners propose and people dispose' that I want to briefly discuss has to do with the world famous Sardar Sarovar Project on Narmada River. SSP must be one of the world's most-planned projects. One of SSP's key planning premises was that the Project would construct lined canals with gated structures going right up to the Village Service Area (VSA) comprising some 400 ha of command. A Water User Association would be organized in each VSA which would simultaneously construct the sub-minor and field channels to convey water from the *pucca* minor to the fields. SSP water was released for the first time in some 80,000 ha of the command just below the dam in 2001. SSP had registered WUA's as co-operatives in some 1100 VSAs on a war footing. When the water was finally released, however, village level distribution structure was not ready in a single village. And it will never be, as we learnt in course of a quick assessment of farmer preparedness to receive Narmada irrigation (Talati and Shah 2004). The perceived sum of the transaction and transformation cost[22] of constructing village distribution systems seemed to far outweigh the benefits people expected out of SSP. There was however a flurry of activity as SSP water began flowing into minors. According to our quick estimates several thousand diesel pumps and several million meters of rubber pipes were purchased by water entrepreneurs to take water to their own fields and to provide irrigation service to others. The trend for new investments in diesel pumps and rubber pipes gathered further momentum in 2002 and 2003; and we found that village communities were none the worse for having violated the SSP planning assumption. The government of Gujarat is however hell-bent on constructing 'proper' village distribution system in the SSP command, never mind if it will take 50 years to complete the canal network.

The *swayambhoo* institutions I have discussed in this section are all driven by opportunism. However, large scale *Swayambhoo* institutions are often driven by more complex motives including long term, collective self-interest. The decentralized mass movement for rain water harvesting and groundwater recharge that Saurashtra region of Gujarat saw from 1987 until 1998 when it got co-opted by the state government is a good example of such an institutional development (Shah 2001). Catalyzed first by stray experiments of 'barefoot hydrologists' to modify open wells to collect monsoon flood waters fired the imagination of a people disillusioned with government programs. Soon, well-recharge was joined by check dams and percolation tanks. With all manner of experimentation going on, a kind of subaltern hydrology of groundwater recharge developed and got energetically disseminated. Religious leaders of sects like *Swadhyaya Pariwar* and *Swaminarayana Sampradaya* helped to ennoble this work by imbuing it with a larger social purpose. The gathering movement generated enormous local goodwill and released philanthropic energies on unprecedented scale, with diamond merchants—originally from Saurashtra but now settled in Surat and Belgium--offering cash, cement companies offering cement at discounted prices, and communities offering millions of days of voluntary labor. In neighboring Rajasthan, Alwar was also undergoing similar mass action; but it was far more limited in scale,

and was orchestrated by Rajendra Singh's Tarun Bharat Sangh. Saurashtra's recharge movement was truly multi-centric, unruly, spontaneous and wholly internally funded with no support from government, international donors and the scientific community, until 1998 when the government of Gujarat piled on and proceeded to rid the movement of its quintessentially *swayambhoo* and voluntary character by announcing a subsidy program (Shah 2001; Shah and Desai 2002).

Table 1. Characteristics of *Swayambhoo* Water Institutions

	Fishing contractors using co-operatives as fronts	Reverse Osmosis plants in North Gujarat's cottage industry	Tubewell companies of North Gujarat and Gujarat's Public Tubewell transfer program	Urban tanker water markets	Irrigation institutions unfolding in the Narmada command	Decentralized groundwater recharge movement of Saurashtra
Scale of the institution	Tens of thousands of small and large tank fishery in India	Around 300 plants in Gujarat	Some 8-10 thousand companies in North Gujarat	Most Indian cities	Several thousand new pumps installed/year	300,000 wells modified for recharge; 50,000 check dams
Economic contribution	Contributed to achieving 7-10 fold increase in inland fishery productivity during 1960-2000	Add and operate water treatment capacity to serve demand for clean water	Create irrigation potential where individual farmers would be unable to do.	Fill the gap between demand and supply	Private investment in water distribution infrastructure; expansion of Narmada irrigation	Improved greatly security of kharif crops, and chance of a rabi crop
Raison de tre	Can protect fish better and therefore can invest in intensive culture fishery which co-ops can not	To profit from serving emerging demand for fluoride-free water by investing in and maintaining RO plant	To pool capital and share risks of tubewell failure in creating and operating an irrigation source in an over-exploited aquifer	To profit from supply of water in cities where public institutions can not cope with the economic demand	To profit by distributing Narmada water by lifting water from canals and transporting it by rubber pipe to user fields	Improve water availability in wells for life-saving irrigation when monsoon makes early withdrawal
Mode of emergence	swayambhoo	swayambhoo	swayambhoo	Swayambhoo	Swayambhoo	Swayambhoo; catalyzed by religious organizations.
Strategy of reducing transaction and transformation cost	Instilling fear amongst poachers	Cultivating annual customers	Vesting management roles into members with largest share in command area	Meet the demand as it occurs in flexible manner	Avoid making of sub-minors and field channels, reduce seepage, overcome topography	Swadhyaya Parivar and Swaminarayan Sampradaya reduced transaction costs of co-operative action
Incentive structure	Pay-off concentration	Pay-off concentration	Pay-off concentration	Pay-off concentration	Pay-off concentration	Self-interest was skillfully blended

						with missionary zeal
Outlook of the 'establishment'	Negative; but changing in states like Gujarat	negative	Negative	Neutral/ negative	Negative/neutral	Initially skeptical; but then, it piggybacked and lessened its swayambhoo character
Preferred Alternative in institutional environment	Registered Fishermen's co-operatives	Community RO plants	Idealized Water User Associations	Municipal water supply improved	Idealized Water User Associations	Narmada project; scientific recharge works

It is difficult to assess the social value of this movement partly because 'formal hydrology' and 'popular hydrology' have failed to find a meeting ground. Scientists want check dams sited near recharge zones; villagers want them close to their wells. Scientists recommend recharge tubewells to counter the silt layer impeding recharge; farmers just direct floodwaters into their wells after filtering. Scientists worry about upstream-downstream externalities; farmers say everyone lives downstream. Scientists say the hard-rock aquifers have too little storage to justify the prolific growth in recharge structures; people say a check dam is worthwhile if their wells provide even 1000 m^3 of life-saving irrigation/ha in times of delayed rain. Hydrologists keep writing the obituary of recharge movement; but the movement has spread from eastern Rajasthan to Gujarat, thence to Madhya Pradesh and Andhra Pradesh. Protagonists think that with better planning and larger coverage, decentralized recharge movement can be a major response to India's groundwater depletion because it can ensure that water tables in pockets of intensive use rebound to pre-development levels at the end of the monsoon season every year they have a good monsoon.

Table 1 offers a comparative view of six high-payoff-low-transaction cost institutions that have emerged in India's water sector in recent years. If we judge institutions by their contribution to increasing productivity and welfare, all the six can be considered successful. Each can be found to operate on a significant scale thus permitting generic lessons. A notable aspect is that each institution has come up spontaneously and flourished as an instrumentality of its players, serving a purpose important to them. Each has devised its own methods to reduce transaction costs and manage incentive structure. Finally, each is widely viewed in the IE —by government officials, NGOs, researchers, international experts and even local opinion leaders-- as a *subaltern* alternative to a mainstream notion of an institution which is considered ideal but has not worked on desired scale. As a result, far from recognizing the potential of these subaltern institutions to further larger social goals, the outlook has been to ignore their existence and social value, or even emasculate them.

Analysis and discussion

Ideas about what kind of institutional change should occur and can sustain come to the IE from four sources.

- *First* of these are theories and hypotheses about how things work. For example, implicit in the thinking of donors such as the World Bank and ADB about metering of farm power is the neo-classical economic theory of marginal cost pricing and a slew of hypotheses and notions about impact subsidies have on the economy.
- *Second* source of ideas is what has worked elsewhere in a similar situation. If groundwater districts in Texas have been able to rein in groundwater overdraft there, why can not similar institutions serve the same purpose here? If IMT has met with some success in Mexico, Colombia, Turkey, why not in India?
- *Third*, and very important source, is what has worked *here*. The repertoire here includes numerous 'successes' of varied types and scales produced by exceptional leaders and industrious NGOs. By virtue of exceptional and highly scarce resources at their command—such as reputation, social status, allegiance of people, funds, goodwill, influence in the IE, manpower—local leaders and NGO's are often able to

drastically reduce transaction costs of institutional change of a certain kind in a limited setting for a limited period. Out of hundreds of thousands of irrigation tanks in India that can produce large pay-offs from improved management, there are but a few hundred in which exceptional local leaders have established and sustained novel institutions for upkeep, maintenance, management and use of tanks to improve the welfare of the community. IWMI-Tata Program studied some 50 of these during 2002-3 (Sakthivadivel et al 2004), and found that while the architecture of institutions (as rules-in-use) varied from case to case, the common aspect of all successful tank institutions was a leader or a leadership compact, which by virtue of the sway he/it has over the community is able to drastically reduce the transaction costs of enforcing an institutional arrangement that would neither work in their absence nor survive them. Successful NGOs similarly create islands of excellence by reducing transaction costs *artificially* and *temporarily*. The *Sukhomajari* experiment with watershed institutions in Haryana in mid-1980's, Vilas Rao Salunke's *Pani Panchayats* in Maharashtra, Aga Khan Rural Support Program's irrigators' association in Raj Samadhiala, Dhan Foundation's Tank User Federations, Development Support Centre's WUAs in Dharoi command in North Gujarat, Community managed tubewells that came up in Vaishali and Deoria in Eastern UP, Anna Hazare's Ralegaon Shiddi, Rajendra Singh's profusion of *johads* in Thanagazi, Alwar district, Chaitanya's conversion of irrigation tanks into percolation tanks in Rayalaseema—all these are examples. That the transaction cost reduction in all these was *artificial* is indicated by the absence of spontaneous lateral expansion/ replication of these experiments despite the high pay-offs they are seen to have produced. That it was *temporary* is evident in that many of these institutions disappeared/stagnated/ declined once the 'transaction cost reducer' was removed from the scene as in *Sukhomajri,* Salunke's *Pani Panchayats,* and others.

- Fourth, and the most important source of ideas about what institutional change should occur and *can sustain* are the *swayambhoo* institutions that have already emerged and are thriving, as we explored in section 6 earlier. These have found ways of reducing transactions costs in ways that are more *natural* and *lasting.* This is evident in that these institutions multiply on their own, and are able to sustain and grow as long as they serve purposes of the participants in the transactions.

In my understanding, these latter institutions offer six useful lessons about how to make institutional change work in the Indian water sector:

1. *Instrumentality:* the first, and the obvious, is that institutional change that multiplies and sustains is invariably an instrumentality of the exchange participants, and not of the players in the IE. "Opportunism with guile" is the driving force even when high ideals and social goals are laboriously espoused as *raison de tre.* Trite as it may sound, design of incentive structures is amongst the most commonly ignored aspect in most institutional development programs. Ideas like community based groundwater demand management propose organizing co-operatives whose sole task would be to persuade their members to reduce their farming and incomes. Similarly, programs to revive traditional community management of tanks commonly overlook the performance-based rewards offered to *neerkattis* and focus primarily on generating voluntary contributions of time and effort for the greater good of the community.

2. Incentive diffusion or perversion: Institutions fail to emerge to take advantage of high-payoff situations often because incentives are diffuse or even perverse, but the transaction costs of implementing change are concentrated in one or a few persons. In fishermen co-ops I discussed earlier, members faced perverse incentives; the co-op stocked the pond but members stole the catch; the secretary had no incentive to make enemies by stopping poachers. When incentives got concentrated in the contractor as the residual claimant, he was willing to control poaching, and invest in higher productivity. Gujarat's public tubewells had no takers until the opportunity arose for incentive concentration. That only a fraction of the surplus created by management improvement needs to be concentrated in the manager was shown 40 years ago by Amartya Sen (1966). In traditional tank institutions in South India, only a portion of the surplus output was offered to the *nirakatti* who absorbed the bulk of the transaction cost of orderly distribution of tank water. This principle is at the heart of irrigation reforms in China. Except where traditional PIM/IMT is supported by a donor loan, China's strategy of making canal irrigation productive and viable consists of changing the incentive structure facing the 'ditch manager' (Shah, Giordano and Wang 2004). Pre-specified volume of water is released into a reservoir and is charged for at a certain volumetric rate. The reservoir manager's remuneration includes a fixed

component and a variable component which increases with the area irrigated from the same total volume of water. Like the Chinese village electrician who is able to perform a high transaction-cost role for fairly modest reward, the ditch manager too is able to improve water productivity for a modest bonus, if recent studies are any guide (Shah, Giordano and Wang 2004).

3. High costs of self-enforcement : Experimenting with the Indian equivalents of Chinese village electricians and ditch managers would be an interesting study. From the transaction cost viewpoint, however, key differences between the Chinese and South Asian villages are two: first, the Chinese in general, thanks to Confucian ethic, are much more law-abiding and respectful to State authority compared to South Asians;[23] second, more importantly, the Village Committees and the Village Party Leader in a Chinese village enjoy far greater power and authority in the village society compared to India's *Gram Panchayats* and *Sarpanch.* This has great implications for transaction costs. North suggests that, "..institutional setting depends on the effectiveness of enforcement. Enforcement is carried out by first party (self-imposed codes of conduct), by second party (retaliation), and/or by a third party (societal sanctions or coercive enforcement by state)." Transaction costs facing an institutional change are determined by the ease of enforcement. A Chinese village electrician or ditch manager backed by the Village Committee and Party leader can enforce the new rules by both retaliation as well as by recourse to coercion through the Party Leader. In India, in contrast, Orissa's model of franchisees for rural billing and collection of electricity bills has attracted many entrepreneurs whose core competence is represented by their muscle power (Panda, pers. comm) because they have no effective local authority to either discipline them or they can turn to in order to defend their rights. For the same reasons, a typical culture fishery contractor has recourse only to retaliation to enforce his property right against a poacher. The high transaction cost of second party enforcement of rules is perhaps the prime reason why entrepreneurs fail to come forward to make a business out of operating a canal or tank irrigation system.

4. Structures of Incentives and of Sanction: Catalyzing effective local IA's management is then a matter of not only designing appropriate incentive structures that entice an entrepreneur to undertake activities with high pay off but also of putting into place a community sanction or authority structures that:[a] enforce his right to do so; and [b] establish the boundaries within which he operates. Here is where a community organization has a role in providing legitimacy or sanction and boundary to a service provider, and thereby reducing his transaction cost of self-enforcement of rules. It is difficult to overemphasize this point which is commonly overlooked in programs of creating participatory institutions. In the much acclaimed traditional tank management institutions, all tank management was done not by the community but the *neerkatti* who had the sanction and legitimacy given by the community and a reward for services that was linked with the benefits they produced for the community. A self-appointed *neerakatti* (water manager) would find it impossible to enforce rules of water distribution amongst *ayakut* farmers. A recent study of *neerakattis* by DHAN Foundation shows that, for various reasons, many tank communities have begun withholding their sanction and questioning the legitimacy of the role *neerakatti's* have played for centuries; as a result, the institution of *neerakatti's* has begun to decline (DHAN Foundation 2003). However, in those few tanks where we find traditional community management still working, it becomes evident that it worked through a clear specification of the 'governance' role of the community organization and the community-sanctioned, well-defined 'management' role of the *neerakatti,* a service provider whose rewards were linked to his performance.[24] The value of this lesson for improving the quality of 'social engineering' is evident in Gujarat government's public tubewell transfer program; after getting nowhere for a decade, it suddenly took off the moment entrepreneurial service providers were offered concentrated incentives coupled by some legitimacy and sanction for undertaking service provision. On these counts, I reckon that such service providers have failed to come forward to provide improved water distribution in surface irrigation projects because neither concentrated incentives nor legitimacy and sanction are on offer for local entrepreneurs who would contemplate taking up such roles. Equally, the entrepreneurial service provider model—such as the culture fishery contractor—operating without the sanction, legitimacy and boundary provided by a community organization too is bound to be fragile.

5. Institutional Environment: Finally, IE has a profound impact on what kind of IA's are promoted or discouraged, and what welfare and productivity impacts these produce (Mansuri and Rao 2004). Informal pump irrigation markets, the fishing contractor, decentralized groundwater recharge movement[25]are spontaneous and

seemingly autonomous; but each of these are amenable to strong positive or negative influence from the IE. Gujarat's cottage RO industry fell to a single swoop by the Bureau of Indian Standards; and the working of pump irrigation markets can change overnight if policies related to electricity pricing and supply to the farm sector were to change. Gujarat's Public Tubewell Transfer program ploughed along without success for a decade and then suddenly took off because an actor in the IE changed the some key rules of the game. And the culture fishery contractor faced drastic reduction in his transaction costs of doing business when the leasing policy for water bodies was changed at the instance of some actor in the IE. How well do actors in the IE understand extant and potential institutions, their net welfare and productivity impacts and their backward and forward linkages determines how much they can influence or manage them.

6. Path-dependence: According to North, institutional change is inherently incremental and path-dependent. It invariably grows out of its context; transposing institutional models that have worked in other, different contexts therefore seldom works in catalyzing institutional change. This has particular relevance to popular institutional notions such as Integrated River Basin Management which have worked in highly formalized water economies in recent years. It is doubtful if such models would work in the same way in the Indian situation simply because by far the bulk of the Indian water economy is informal and outside the direct ambit of the IE.

Conclusions

In conclusion:

- institutional analysis of water sector normally focuses on law, policy and administration, the three pillars of water institutions; however, these constitute the *IE;* and the analysis can not be complete without understanding the *institutional arrangements,* which represent the 'rules in use';
- institutional alternatives available to improve the functioning of a water economy depends critically on the degree of its formalization; in informal water economies, the IE has limited sweep over water transactions which are dominated by IA's; as water economies formalize, the sweep of the IE expands to encompass most or all of water transactions;
- India's water economy today is at the level of informality that characterized many European water economies in 18th century; as a result, strategies of institutional reform that would be appropriate for India can not be what works in highly formalized water economies such as of Europe today;
- players in India's IE must seek opportunities for improved performance of the water economy by catalyzing productivity-enhancing reform in IA's;
- India's experience in doing this has been indifferent because reforms pursued have either low pay-offs or high transaction costs or both;
- on the other hand, we have overlooked and failed to learn from large-scale spontaneous institutional change which has enhanced welfare and productivity and reduced transaction costs;

Analyzing these issues suggests that *induced* institutional reform can succeed provided:

- it is instrumental to its participants rather than to the actors in the IE;
- it concentrates incentives in the bearer of the transaction costs;
- provides effective third-party enforcement of rules; failing which,
- it uses community consensus to create legitimacy and authority structure; and designs incentive structure to entice entrepreneurs who will undertake activities with high pay-offs;
- IE has power to stimulate or impede institutional change; and
- institutional change is inherently incremental and context-dependent; transposing models of institutional change that have worked in other, markedly different contexts, seldom work.

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Notes

[1] Formal and informal economies are a matter of elaborate study in institutional economics. Fiege (1990) summarizes a variety of notions of informality deployed by different researchers. According to Weeks (1975) cited in Fiege (1990, footnote 6), "The distinction between a formal and informal sector is based on the organizational characteristics of exchange relationships and the position of economic activity vis-à-vis the State. Basically, the formal sector includes government activity itself and those enterprises in the private sector which are officially recognized, fostered, nurtured and regulated by the State.. Operations in the informal sector are characterized by the absence of such benefits.". According to Portes, Blitzer and Curtis (1987 cited in Fiege 1990, foot note 6), "the informal sector can be defined as the sum total of income generating activities outside the modern contractual relationships of production. According to Portes and Saassen-Koo (1987 cited in Fiege 1990, foot note 6) in formal sector activities are ' not intrinsically illegal but in which production and exchange escape legal regulation." To most researchers, an informal economy is marked by the 'absence of official regulation' or 'official status'.

[2] North (2) defines the transaction sector as 'that part of transactions that goes through the market and therefore can be measured' and according to North, rapid growth in the transaction sector is at the heart of the transformation of a traditional economy into a modern one.

[3] The survey estimated that approximately 36% of all rural households (which include farmers, farm laborers and households dependent on off-farm livelihoods) used some means of irrigation. Of these, 13.3% (i.e. 37% of irrigators) use their own source (well/tubewell), 15.3% (i.e., 42.5% of irrigators) used shared tubewells or purchased water, and 12.1% (36% of irrigators) used government owned tubewell, canal or river. Less than 2% used locally managed irrigation source. 6.6% used more than one source which is why the percentages fail to add up to 100. The survey also found that of 78990 households interviewed, 48% reported no 'availability of community and government water resources in villages of their residence"; another 42% reported the presence of community or government source but 'without local management'. Only 10 % of households reported living in villages with access to community or government water sources 'with local management' by community or government or both (p 44). Only 23% of all households interviewed reported depending for irrigation on a source 'other than self-owned"; 30% using water for livestock rearing reported dependence on a source 'other than self-owned'.

[4] If recent accounts of the travails facing global water companies like Vivendi and Thames Water who are forced to wind up even in these increasingly affluent east- Asian cities is any guide, we must conclude that South Asian cities have a long way to go before they can afford water supply systems of European or North American quality (see, The Economist, August 15-21, 2004).

[5] Societies often experience wide-ranging ideological or cultural upheavals during which customs, traditions, mores and values undergo massive change. India's Independence Movement—and the rise of Gandhian ethos--marked one such phase in India's history. On a smaller scale, the water harvesting movement in Saurashtra under the inspiration of religious formations such as *Swadhyaya Pariwar* and *Swaminarayan Sampradaya* too represent an L1 level change. Both these however have proved largely transient; besides occasional lip service paid, Gandhian ethos and ideals no longer dominate Indian psyche quite like they did during 1940's; and Saurashtra's water harvesting movement too is now energized by Gujarat Government's 60:40 scheme of government versus community contribution rather than the ideal of self-help the religious leaders had inspired.

[6] A good example is Francis Corten's work during the 1980's on reorienting the irrigation bureaucracy.

[7] A charismatic and energetic political or bureaucratic leader does often produce significant attitude and behaviour change; however, these generally fail to last for long after the leader is removed from the scene. In this sense, such change is not enduring.

[8] Anil Shah, an illustrious former bureaucrat from Government of Gujarat fondly tells the story about Gujarat's groundwater bill which was passed by the assembly in 1973. When the Chief Minister was

required to sign it into the government gazette, he refused to do so because it required that every irrigation well be registered. His curt response to Mr Shah was: "Can you imagine that as soon as this bill becomes a law, every Talati (Village Level Revenue Official) will have one more means at his disposal to extract bribes from farmers?" This is the reason why there are no takers for the draft Groundwater Bill that MoWR of GoI has been tossing around to states since 1970.

[9] The AP law tried harder to come to grips with rampant groundwater over-exploitation in Andhra Pradesh by emphasizing the registration of wells and drilling agencies and stipulating punitive measures for non-compliance.

[10] The 1987 Water Policy to Saleth (2004:29) is "..such a simple non-binding policy statement".

[11] Although the Network Reform program is a National Government program, the government contributes only a part of the resources, the balance being contributed by the Village Committee. Just to give an example, Guantun village in Yanjin country of Henan got a grant of Y 60,000 under this project for infrastructure rehabilitation. To match this, the village contributed Y 60000 too; of this 60% came from the funds from the village collective; and the remaining 40% were raised as farmer contributions by charging Y 80/person. All the power lines and other infrastructure was rehabilitated during recent years under this national program. New meters were purchased by the township in bulk and installed in users' homes on a cost recovery basis. A system of monitoring meters was installed too.

[12] The village electrician's reward system encourages him to exert pressures to achieve greater efficiency by cutting line losses. In Dong Wang Nnu village in Ci county, in Hebei Province, the village committee's single large transformer which served both domestic and agricultural connections caused heavy line losses at 22-25%. Once the Network Reform Program began, he pressurized the VC to sell the old transformer to the County Electricity Bureau and raise Y 10000 (partly by collecting a levy of Y 25/family and partly by a contribution from the Village Development Fund) to get two new transformers, one for domestic connections and the other for pumps. Since then, power losses have fallen to the permissible 12% here.

[13] Saleth (2004: 30) asserts, " ..most of the organizational reforms, including the promotion of basin-based organizations observed in states such as Andhra Pradesh, Tamil Nadu, Orissa, and Uttar Pradesh were introduced under different World Bank-funded projects." It is equally clear that Andhra Pradesh's irrigation reforms proceeded at a hectic pace because a World Bank loan was able to kindle interest at all levels in new resources available for maintenance work.

[14] And that too only when a mid-sized NGO invests years of effort and resources in organizing WUAs and using means to reduce transaction costs that farmers on their own would normally not possess. Some of the best known examples of successful PIM/IMT are Ozar on Waghad project in Nashik, Maharashtra, Dharoi in North Gujarat, Pingot and a few more medium schemes in Bharuch district. The success of farmer management in all these—and its beneficial impact-- is undisputed. In each of these, however, there was a level of investment of motivation, skill, time, effort and money which is unlikely to be replicated on a large scale. In catalyzing Ozar co-operatives, Bapu Upadhye and Bharat Kawale and their Samaj Pragati Kendra, and senior researchers of SOPPEKOM invested years of effort to make PIM work (Paranjapye and Joy 2003). In Gujarat, between Aga Khan Rural Support Program and Development Support Centre, Anil Shah and Apoorva Oza have invested at least 30 professional staff time to organize say 20- 30 thousand flow irrigators in to functional WUAs. My intent is not to undermine this exceptional work but to suggest that no government agency had the quality and scale of resources needed to implement an institutional intervention that can sustainably raise the productivity of the 28-30 million ha of flow irrigated area in India over say 15 years.

[15] Some random excerpts from Joseph (2001) based on his study of Malampuzha Project: "It is the CADA officials who took the initiative in their formation and not the farmer groups. In most cases, membership fee of Rs 5 was not paid by the farmers concerned; payment was made on their behalf by prospective office bearers, or the potential contractors of field channel lining or the large farmers in the *ayacut.* ..86 percent (of the BFAs) were formed in these two years (1986 and 1987) .. for making possible the utilization of funds.. .Only 57 CC meetings were held by the 8 Canal Committees during a span of 10 years..43 of them were held without quorum and 35 with zero attendance of non-official members.. The level of knowledge .. about CCs.. and there structure and functions is very low…"

[16] In a recent paper, Mansuri and Rao (2004) have reviewed a much larger body of evidence from several sectors to assess the extent to which Community-based and community-driven development projects for poverty alleviation and have concluded that these have not been particularly successful in targeting the poor; they also concluded that there is no evidence to suggest that participatory elements and processes lead to improved project outcomes and qualities; that community-based development is not necessarily empowering

in practice; and 'there is virtually no reliable evidence on community participation projects actually increasing a community's capacity for collective action.' (p. 31)

[17] Even in middle-income countries, huge inequalities in land holdings seem to have helped IMT. In the Andean region of Colombia where IMT has succeeded, according to Ramirez and Vargas (1999), farmers 'mostly grow crops oriented to the external markets, mainly banana and oil palm'; and while 66% of the farms have 5 ha or less, 40.3% of the land is owned by 2.8% of large farmers owning 50 ha or more. In South Africa, numerous Irrigation Boards —Water User Associations par excellence—have managed irrigation systems successfully for long; but their members are all large white commercial farmers operating highly successful citrus and wine orchards. In Turkey, 40% of the irrigated area was in 5-20 ha holdings with a strong focus on high value commercial crops for export to Europe. Here in Turkey, it can be argued, IMT succeeded because, as with South African Irrigation Boards, in many respects, there already was a 40-year old tradition of farmer participation in the maintenance of the canal system through informal village level organization. Equally, irrigation fees under self-management in Turkey was 2% or less of the value of production per ha, 3.5% or less of total variable cost of cultivation and less than 6% of gross margin (Svendsen and Gladys 1997).

[18] A large survey, which covered over 48,000 farming households throughout India during January-June 1998, suggested that over 66% of India's Gross Cropped Area under 5 most important field crops (which accounts for over 90% of the Gross Cropped Area) is irrigated; only a quarter of irrigated area is served by government canals. Amongst other interesting things it suggests is that every fourth Indian farming household likely owns a diesel or electric pump; and that area irrigated through groundwater markets is as large as the area irrigated by all government canals (NSSO 1999).

[19] As North (1990) aptly notes, "If the highest rates of return in a society are to piracy, the organizations will invest in knowledge and skills that will make them better pirates; if the pay offs are .. to increase productivity, they will invest in skills and knowledge to achieve that objective." (North 2).

[20] An IWMI –Tata study (Indu 2001) surveyed a sample of 14 such plants which served 4890 households. RO water in 10 and 20 litre cans is delivered daily at the customer's door step; charges are levied on an annual basis (Rs 1500 for a 10 litre can daily; Rs 2500 for a 20 litre can). Plant capacities vary from 500-2000 litres/hour. In addition, most plants also retail RO water in pouches at bus-stands, railway stations and crossings, market places. Consumers of pouches are typically low income buyers; retailers are also poor youth working on commission. In sum, this institution serves a demand by transforming 800-2000 ppm TDS water to 150-300 ppm TDS water and fluoride levels reduced to 0.25-0.5 mg/litre. People had no way to ascertain the quality; but 60 customers surveyed by Indu (2004) asserted that RO water taste was distinct. Many also claimed relief in pain from skeletal fluorosis after taking to RO water.

[21] Registering a co-operative itself meant great hassle and cost in time and money. The policy also required that 2/3rd of the command area farmers submit a written no-objection declaration for the transfer; past defaulters on water fees must first pay up their dues. In addition, several conditions were specified the violation of any of which would qualify the Government to take back the tubewell.

[22] Transformation cost would include the cost of labour and material in making a lined sub-minor and field channels plus the cost of acquiring land. Transaction cost would basically involve persuading farmers to give up their land for making channels and to give right of way to carry water to down-stream farmers.

[23] This has much to do with their histories. For 2000 years, right until 1911, China has been a unified, tightly-governed state through a large, organized bureaucracy that ensured respect for law and the authority of the state. The seeds of an organized bureaucracy in China were sown in BC 250 by Qinshi Huangdi, its first Emperor. Starting from the present day Shaanxi, Huangdi—who ruled for all of 11 years-- unified numerous feuding kingdoms in what is today's China (or most of it) and created a legalist political system of governing his subjects as an 'austere totalitarian society in which everyone informed on each other.' (Becker 2000). This, in its essentials, has survived to date. He created a single currency, nationalized all land and natural resources, standardized weights and measures, gave China a single script with 3000 characters and produced homogeneity in people's thought by destroying all books apart from legalist works and rallied society around the common goal of creating a 'rich and powerful country'. The empire created by Huangdi was overthrown by a succession of dynasties starting with the Han who fought to recreate the old kingdoms. However, until well into the 20th century, China retained the tradition of a unified state with a centralized bureaucracy, the penal code and the Legalist political system espoused by Huangdi. In contrast, never in the history of South Asia have ordinary citizens been subjected to a unified system of governance for a sustained period of time. A major reason probably is that except for brief periods—when regents like Asoka, Harshawardhan, Akbar

ruled huge empires— what are now India, Pakistan, Bangladesh, Sri Lanka and Nepal were ruled over by numerous kings through feudal chiefs and overlords constantly engaged in internecine strife. Indeed, plundering neighboring states was the principal source of revenue of many a South Asian ruler. These regions came under unified administration only during the Colonial period which created a bureaucracy as an instrument of governance.

[24] This is put into bold relief in a new, unpublished case study of traditional community management institution in Mudiyanur tank in a system of 10 tanks in Uthanur watershed in Kolar district (Reddy, Hiremath and Mohammad 2004). Despite sweeping socio-economic changes in its surround during recent decades, as if stuck in a time-warp, the management institution of this 1200 year old tank has still retained many of its traditional features. Its striking aspect is the fine distinction between the specialized governance role of the caste-based 'Council of Elders' (CoE), the community organization responsible to oversee general administration of all 7 villages sharing the tank and the role of *neerkatti's* (water managers) and *Thooti's* (village guards)-- as management-agents of the Council of Elders. Most routine aspects of decision making is taken care of by inherited rules and norms that result in 'well-established patterns of behaviour' such as on crop choice, time of opening the sluice under different rainfall regimes, payments to be made to *neerakatti's* and labour contribution in maintaining supply channels. The role of the *neerakatti's* is to execute these routine tasks on behalf of the CoE; and his reward is a piece of cultivable, inheritable *inam* land in the command and 10 bundles of hay with grains per each of the 250 odd roughly equal pieces of *ayacut* land cultivated. The CoE gets into the act only when conflict-mediation goes beyond the authority vested in the *neerakatti* or when circumstances arise that require responding to a new discontinuity. Recently, as water inflow into the tank has steadily declined, the CoE decided to disallow sugarcane 20 years ago or more recently to make a new rule that divided the 240 acreas of ayacut into 3 parts and irrigate one part per year in annual turns. Helping the CoE to decide if water available can support the irrigation of a summer crop, orderly distribution of water in the *ayacut* without any intervention from farmers, deciding the *amount* of irrigation to be given at different stages of crop growth, undertaking repairs and maintenance of sluice (himself) and canals and supply channels by mobilizing labor from member are amongst the tasks performed by the *neerkatti.* Cleaning of distributaries is done by farmer/s benefiting from them; however, main canals never get cleaned of weed and silt unless the *neerkatti* summons all farmers to work on it on a fixed day. All in all, in the smooth management of the tank, the *neerakatti* plays the pivotal management role; he *is* the operating system of the institution; the CoE, mostly invisible and unobtrusive, vest in him the authority and sanction to play that role on behalf of all the members. A tank management institution without CoE or the *neerakatti* would be a far lesser institution.

[25] In Vadodara district, several leases given to fishing contractors were withdrawn because the communities rejected the contractors. In one case, for instance, the contractor used dead animals as manure, a practice that offended the community. In another, the chemical fertilizers used by the contractor ended up in a drinking water well in the tank foreshore; when it found out, the village refused to renew the lease. Such aberrations would not occur if the contractor had to obtain the legitimacy and sanction of the community to operate.

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Current reforms and their implications for rural water management in Tanzania

Ibrahim H. Juma and Faustin P. Maganga

Tanzania is at an advanced stage of drafting a new legal framework for water resources management, aimed at attaining the objectives of the National Water Policy of 2002. Three separate pieces of legislation will result from the proposed legal framework to cover water resources management, rural water supply and urban water supply and sewerage. This paper discusses the government's efforts in trying to fix property regimes and formalizing informal arrangements related to the use of water resources. The paper traces historically the process of formalising customary laws, then presents four case studies that display interactions between traditional water management systems and the modern, formal systems. The paper also contains a discussion of the proposed policy and legal changes focusing on the extent to which the proposed legislative dispensation will protect the existing traditional or customary water rights. It is argued that, despite the early initiatives at providing space for the growth of customary law, the legal system pertaining in Tanzania today is tilted more in favour of formal than informal systems.

Keywords: water rights, water tenure, legal pluralism, conflict, integrated water resources management, Tanzania

Introduction

Tanzania is currently at an advanced stage of drafting a new legal framework for water resources management. The new legislation is aimed at attaining the objectives of the National Water Policy of 2002 (URT, 2002). This policy aims to develop a comprehensive framework for sustainable development and management of the nation's water resources including:

- the introduction of cost sharing and beneficiary participation in planning, construction, operation and maintenance of community-based domestic water supply schemes; and
- a composition of three sub-sectors, one of which is Water Resources Management which would aim to provide a comprehensive framework for promoting optimal, sustainable and equitable development and use of water resources for the benefit of all.

For water resources management the policy envisages that:

- water allocation shall be prioritised for human needs (adequate quantity and acceptable quality) and for environmental protection (environmental flows);
- a sound information and knowledge base including both data on surface and groundwater, social and economic data shall be established;
- fees and government subvention will finance water resources management. The fee system includes a fee for conservation; and
- use of technical, economic, administrative and legal instruments will be enhanced. Proposed economic instruments include water pricing, charges and penalties.

This paper discusses the government's efforts in trying to fix property regimes and formalizing informal arrangements related to the use of water resources. In Tanzania different customary arrangements for water development, use, and management have been studied and documented in-depth (see Maganga and Juma 2000; Boesen et al 1999). According to these studies, its is possible to distinguish four different ways of conceptualising customary law, as follows:

- 'tribal' customary laws of specific ethnic groups;
- 'formal' customary law which is recognised in courts of law;
- customary law as it was enforced by traditional authorities (e.g. chiefs, headmen); and (this system was severely undermined by the abolition of chieftaincy in 1962); and

- living customary law - current people's customs and practices presently, and the principles underlying these practices. It is this 'living customary law' that has invariably been described as informal. It includes aspects of customary law, statutory provision and day to day practice of a community concerned.

The paper traces historically the process of formalising customary laws; then presents four case studies that display interactions between traditional water management systems and the modern, formal systems. The paper also contains a discussion of the proposed policy and legal changes, focusing on the extent to which the proposed legislative dispensation will protect the existing traditional, or customary water rights. It is argued that, despite the early initiatives at providing space for the growth of customary law, the legal system pertaining in Tanzania today is tilted more in favour of formal than informal systems. While narrowing down to identification of customary/traditional water laws, the paper looks at other areas where customary laws have come out very clearly. Customary land tenures are examples of areas where customary law has received more coverage by case law, statutory intervention and academic writings. The wider coverage in land matters provides some good insights of problems which are likely to face the articulation of customary water laws. Unlike customary land laws, customary water laws have not under the current legal framework received statutory and judicial recognition. So experience of customary laws over land is used to project the texture of the customary water laws if courts and parliament intervene. Parliament will indeed intervene to define customary water laws if the circulating drafts of the proposed water laws are passed into law. Section 2 of the proposed draft Bill on Water Resources Management defines 'customary water rights' to mean the rights and practices in relation to water resources that have been practised by communities or individuals since time immemorial in the belief that they create binding rights and obligations.

Towards formalisation of customary law

The early years of independence found a number of African countries facing the challenge of trying to define the place and position of customary law, while at the same time building modern nation states. A series of conferences were conducted to chart out the future of customary and Islamic law within the emerging legal systems of these independent African states. The idea was to allow customary law to organically grow within the legal systems of the emerging states, and then for it to be absorbed into mainstream laws (formal). These ground-breaking conferences discussed the contemporary definition and ambit of customary law in Africa; their respective place in the legal systems; the policy that should be adopted regarding uniformity of customary law in newly independent Africa countries; the problems of how to ascertain and record Islamic and customary laws and the conflicts of laws[1]. Subsequent to the London Conference another conference was held in Dar es Salaam from 9-19 September 1963[2] to consider matters touching upon both Islamic law and customary law. In particular the conference considered two main questions: the future of the local courts; and the place of customary law in the modern African legal systems (Rubin and Cotran, 1971).

In 1961, the Legislative Council enacted the Judicature and Application of Laws Ordinance (JALO), to provide for a general framework for the growth and development of customary law in Tanzania. This piece of legislation provides a helpful guide on the extent to which customary law is accepted as one of the sources of applicable laws. The Ordinance is very clear that customary laws and Islamic laws cannot apply over areas covered by written laws. This confirms the predominance of the formal-written over informal unwritten laws, implying that Islamic and customary law do not apply over areas where an Act of Parliament make provisions. The legislation gave customary laws a very general formal recognition, setting strict parameters within which customary law could later grow and develop. According to JALO, customary law may only apply over matters of a civil nature and does not extend to cover criminal matters. Second, in order for customary law to apply it should be between members of a community in which rules of customary law relevant to the matter are established. Hence, statutory law courts could not apply any rule or practice of customary law, which is abolished, prohibited, punishable, declared unlawful or expressly or impliedly superseded by any written law.

Under the statutory scheme provided by the Judicature and Application of Laws Ordinance 1961, customary laws were to grow under the ambit of district councils. Apart from a few District Councils who formalized customary laws of inheritance, custody of children and affiliation, no district council has used this avenue to organically formalize customary water laws. The potential within the district councils to formalize local customary water laws have not been employed.

Interactions between traditional and modern water management systems

The four case studies below illustrate how formal and informal institutions inter-play in water resource use and management.

Box 1. The Taiko clan vs other Landanai villagers

Landanai village is situated in Naberera Ward, Simanjiro District in Manyara Region, in the Pangani Basin. The Maasai clan of Taiko Muna Mamasila applied for a water right to control water from Landanai springs. Development of the springs is traced historically to the German period of rule during the early part of the 20th century,. Later a Greek known as George renovated the springs and even later the Roman Catholic Church renovated the scheme on behalf of the community and the village government. Canals had already been built to collect and convey water from the springs to cattle troughs. Over the years the members of the Taiko clan repaired the scheme. Members of the clan claim that payment for the development of the scheme was made by contributing their livestock to pay for the maintenance of the scheme.

However, it was also alleged that the Landanai water scheme has also been maintained frequently by other Landanai villagers, apart from the Taiko clan. The villagers rely upon the scheme for their water needs. Officers of the Pangani Water Basin were of the strong view that it could not in the circumstances allow one clan alone to apply for a water right over the springs. The Basin was wary of possible conflicts likely to result from an exclusive grant of a water right. Already there were claims that some villagers had been beaten for using the water. Therefore, the Simanjiro District Executive Director was advised to block that granting a Water Right to one clan alone since it would exacerbate conflict within the community.

The Pangani Basin Water Office recommended that Landanai village government and village assembly (involving all villagers) should be convened in February 2004 to decide who should apply for water right over Landanai springs. A delegation from the Pangani Basin Water Board and Central Water Board (Dar es Salaam) attended the first village government meeting. The delegation took time to explain the procedure to be followed by those applying for water rights. The meeting recommended to the village assembly held the next day that the village should form a committee of users of Landanai water springs who should apply for the water right. It was recommended that this Committee be made up of: 4 members drawn from Taiko clan; two members from other pastoralist clans, and 4 members drawn from the agricultural communities resident in Landanai village. It was agreed that amongst the committee members there should be at least two women drawn from pastoralists and agricultural communities. Between 200 and 300 villagers attended the village assembly meeting. The assembly agreed with the recommendations of the village government. The Committee was mandated to work under Landanai Village government for three years.

The case study of Landanai village (Box 1) illustrates how Maasai customary water law contended with the mainstream statutory framework. The mainstream package of law and institutions here includes statutory provisions and resulting institutions like the Basin Water Board, village governments and district and regional administrative structures. The Lanandai case provides an example of how an application by a clan for water right could not be sustained against the wider interests of the village and other customary water users. A traditional body with partial control over a water source, wanted to use the modern system of water rights to reinforce its hold over the source

Potkanski (1994) contains a succinct description of Maasai traditions related to water management. Traditionally, amongst the Maasai, access to water for domestic use is freely granted to all on request. The need for ownership of water sources only makes sense in the dry season, when there is a relative shortage throughout ‘Maasailand’. All water sources in ‘Maasailand’ are either collectively owned, or are individual property. Neither the collective nor individual categories of ownership have a distinct name in the Maa language. Instead, they are given locality names, and their status is known to all. Water sources with a relatively small output (‘standing water’) include the wells and small springs with relatively short streams of a few meters which end up at cattle-troughs. These are individually owned. The large water sources (‘flowing water’) are the longer streams and rivers, which are collectively owned. For the Maasai, this division is ideologically grounded and comes from their model of the world. According to them, flowing water has been created by God for all Maasai, and cannot be owned by an individual person. It is a common resource, governed by the principles of common property management. Sources of standing water are the property of those who dug them if it is a well, or first discovered them if it is a spring. Rights to this water pass to a man’s heirs, following the rule of primogeniture. However, the Lanandai case shows how the Taiko clan wanted to go beyond these Maasai traditions.

The response by the Pangani Basin Water Office and the government illustrate how application of mainstream laws may facilitate equitable conflict management in communities with multiplicity of customary systems. This intervention helped to avert a possible conflict between the Taiko clan and the rest of the villagers in Landanai.

Box 2. Ndung'u Irrigation Project vs Pare customary law

The village of Ndung'u is situated in the local government Ward of Ndung'u of Same Distric in Pangani Basin. The village is part of the Same District Council. It is a traditional village of the Wapare people, although there are also other tribes like the Sambaa, and Maasai pastoralists. The village enjoys year round irrigation water from a number of rivers and streams which is used by around 2000 villagers. Paddy is grown twice a year. .

Traditionally, land in Ndung'u was owned under customary arrangements, including in the areas covered by the irrigation project. There are several cases of customary owners leasing their irrigated blocks to others. Conflicts over land between owners and outsiders were almost non-existent because ownership was in accordance with customary arrangements which were well established and respected. Conflicts over land were restricted to relatives competing over inherited parcels or tenants failing to comply with applicable agreements. These conflicts were referred to traditional bodies known as kitala.

Following the penetration of statutory laws, projects and other institutions, land disputes are now referred to the irrigation project leadership. If the project leadership fails to resolve an issue, the dispute is taken before the *Baraza la Ardhi la Kijiji* (the Village Land Tribunal). A new hybrid of the customary system with a strong dose of mainstream values is in place. This hybrid came in the form of the subsidiary legislation made by the Same District Council under Local Government (District Authorities) Act, 1982to regulate irrigation agriculture in Ndungu area of Same district (Same District Council, 1994) The by-laws cover the Mkomazi river valley area of Ndungu designated as a project area for purposes of agricultural development. Mkomazi river is a controlled water source under the Water Utilisation (Control and Regulation) Act, 1974.

Ndung'u Irrigation project extracts water from Mkomazi river under a water right issued by the Pangani River Basin. The project has taken over the control over a number of facilities that were constructed over land and water sources occupied and used under customary law of the Wapare people. Existing land and water tenure system were as a result of the project divided into blocks forming (i) main and secondary drains from Mkomazi river and their related structures; (ii) main and secondary irrigation canals, intake weir, water gates and other related structures; (iii) tertiary irrigation canals and drains; (iv) flood dikes, gates and other installations for prevention of flood, (v) water course and their related structures, and (vi) trunk road, main and secondary farm road, warehouse, residential quarters and any utility designated for residential or infrastructural purposes. The irrigation project also spelt the end of traditional water and land management systems. The district council established a project office responsible for the running and maintenance of the irrigation project. It must be observed that the project retained to certain extent traditional system, because each irrigation block elects its own leaders and committees, and these leaders are mostly drawn from those families, which in the past exercised control over water and land management.

There is in place also an Executive Committee of the project assisting the Council. This Committee is composed of District (i) Commissioner or his representative; (ii) District Director or his representative; (iii) Chairman of the Same District Council; (iv) Chairman to the standing committee on economic affairs of the Same District Council; (v) two councillors from the project area; (vi) two prominent farmers nominated by project beneficiaries (defined to mean any person or community holding any agricultural land within the project area). Functions of the executive committee have obviously taken over those which customary organs would exercise. The committee enjoys overall oversight of the project. It discusses, reviews and approves- (i) past performance of the project office and the water user's group operating in tertiary blocks; (ii) annual programmes for the operation and maintenance of the project; (ii) expenditures and budget, on the running of the project office. Other activities of the Committee include approval of the appointment of the project Manager, and determination of the amount of water charges to be imposed on the project beneficiaries. Project beneficiaries have formed two Water Users's assemblies for the Ndungu and Misufini areas. Each of the two assemblies elects a chairman, a secretary and an accountant. Assemblies meet at least once every year to discuss irrigation plans and methods. The assemblies also meet to supervise, direct or otherwise coordinate activities of Water Users' Groups. Assemblies designate methods of imposition and collection of water charges. Water Users' Groups, operating at the level of tertiary blocks execute orders and instructions flowing from project office. These groups are described as terminal organs of the project office. The groups are ultimately required to ensure proper operation and maintenance of the terminal project facilities. These groups decide on the water distribution plan within their respective tertiary blocks. Water Users' Groups settle disputes arising among members of the group and take care of water distribution within tertiary blocks.

There is no doubt that implementation of the irrigation project as illustrated in Box 2 has completely changed the pre-existing customary tenures in Ndung'u. The limited space for the application of customary water and land laws is closely related to the increasing power of the District Council. The Council is vested with a lot of power over the organization and administration of the project office. The day-to-day activities of the project office are under a Project Manager who remains answerable to the Council.

Despite delegation of powers to the level of Water Users' Assemblies and Water Users' Groups, project beneficiaries are subject to control from both the District Council and the project office. The project office may for instance change or vary the irrigation schedules according to weather conditions. The district council may impose water charges upon beneficiaries in consideration for the use of project facilities and irrigation water. Project beneficiaries are not allowed to alter the form and nature of the agricultural land without written

approval of the district council. Again, the project manager, members of executive committee and any person authorized by the district council may without prior notice enter any land of a project beneficiary for the purpose of surveying and inspecting operations and maintenance of the project facilities and conditions of agricultural land. Project beneficiaries are required to sell to the Primary society allocated in the project the products from their agricultural land. By-laws have also taken over the place of punishments existing under customary laws. By laws prohibit tenant farming within the project areas. All agricultural land is to be cultivated and managed by project beneficiaries only. This prohibition does not cover hiring of temporary labour on parcels of land.

Hence, it can be concluded that unless development projects specifically engage with customary law, they are likely to marginalize and replace it. We have noted how the project Executive Committee has taken over functions which were previously exercised by customary organs. The composition of the Committee, including the 'two prominent farmers nominated by project beneficiaries' may exclude poor farmers and women. The repercussions of this could be negative for marginalized villagers who are not well placed to capture the benefits of the project.

Box 3. Formal water rights vs multiple uses of irrigation water

Festo Magidanga was fishing in a canal to which NAFCO_Mbarali Farm had water rights and he was arrested and charged at the Rujewa Primary Court (NAFCO-Mbarali vs Festo Magidanga Criminal Case No. 162/ 1998). NAFCO-Mbarali State Farm accused Festo Magidanga of Criminal Trespass, contrary to section 299 of the Penal Code, which creates an offence of unlawful entering into or upon property in the possession of another with intent to commit an offence or to intimidate, insult or annoy any person in possession of such property; or having lawfully entered into or upon property unlawfully remains there with intent thereby to intimidate, insult or annoy any such person, or with intent to commit any offence. It was stated in court that Magidanga had blocked the flow of water in order to fish. Luckily for him, the officials of the State Farm failed to appear in court to give evidence against him, and he was released under Section 32 (1) of the Magistrates' Courts Act, 1984. Nevertheless, he had tasted the turmoil of police arrest and harassment by the law-enforcement state apparatus.

The government established the Basin Water Boards and Offices in order to manage water utilisation by different users, i.e. to allocate water rights; legalise, grant, modify and control water abstractions; protect the existing water rights and take to court defaulters of the Water Utilisation (Control and Regulation) Act, 1974. In many cases however, the formal statutory systems ignore multiple water usage of water which is allocated for a specific purpose (e.g. irrigation). The example in Box 3, which was first cited in Maganga and Juma (2000), illustrates a problem which is faced by many villagers who find it unacceptable not to utilise water passing near their premises simply because other people or institutions hold water rights.

In the case in Box 4, which was also reported in Maganga et al (2004)**,** Simon Dangala first uses customary arrangement to obtain water for irrigation. However, he switches to statutory arrangements of applying for Right of Occupancy, when he sees that he could take advantage of this system for personal benefit, even though he ends up creating conflict and tension within the community.

The proposed water law seeks to define and integrate customary water law within the statutory systems. This is to be done through recognition by registration of customary water rights. The case studies provide a number of lessons to law reformers. The cases bring out some of the problems likely to be faced when customary water law is recognised as part of the mainstream Tanzania. We can draw a lesson that prevailing systems of customary water law involves not just utilisation of water but is closely linked to other external factors like markets for local products, injection of external capital (like irrigation), prevailing inheritance, legal system (system of local governance) and availability of mainstream courts operating outside the control of customary law institutions. All these impact on the texture of customary water law. The case studies also illustrate the huge diversity amongst customary water laws even within the same district. Law reformers will have to contend with this diversity and conflicting interests and how it will affect the basin-wide water resources management. Apart from traditional leaders who enjoy local respect law reformers will have to visualise how these will work with local government laws and institutions, all within the water basins.

Box 4. Searching for justice from statutory organs

In 1969 Simon Dangala in collaboration with 5 other villagers started the Manyenga irrigation canal. They invited other villagers to join in, and soon the canal had a membership of 36 villagers, most of them cultivating rice. As the membership grew, tensions started emerging among them, especially regarding maintenance of the canal, and competition over scarce water. All the other villagers who started the canal have since died. In 1997 SD (who actually lives in another village, Mawindi), applied for and got a 33-year Right of Occupancy for 59 acres of land on the upstream of the canal, creating tensions with villagers who depended on the canal downstream. SD did not have the ability to cultivate all the 59 acres, cultivating only about 4-5 acres, and renting the rest for between T. shs 15,000/= and T.shs 20,000/= per acre. The Rufiji Basin Water Board encouraged the villagers to form a Water Users Association in order to benefit from a World Bank-assisted Smallholder Irrigation Project. In 1998 the villagers applied for Water Right for their Association, but SD objected, since the canal passed through his land. He demanded a "compensation" of T. shs 150,000/= for his efforts in maintaining the canal since 1969, before he could allow the canal to pass through "his land".

In 2001, SD filed a civil case before Rujewa Primary Court, alleging that Adriano and Ayubu had encroached and trespassed into his duly registered canal by building bricks (Simon Dangala vs AdrianoTandika and Ayubu Kanyamala Civil Case 38 of 2001, Rujewa Primary Court). The canal in question was registered in Dangala's name and given number RBWO 96. He traced his ownership to the canal to a 1997 letter from the Rufiji Basin Office. The letter urged him to pay for the Water Right before 1st June 1998, and on 14th October 1998 he was given the Water Right, stipulating terms and conditions for his use of water. The complainant claimed that after getting the water Right he built a canal in 1999 by engaging the services of paid casual labourers. On 19th October 2001 while returning from his farms he found the respondents constructing a canal to draw water from the source, through his farms SD denied that he was a member of the Irrigation Association of Manyenga "A". Adriano Tandika told the Primary Court that he farmed at Manyenga, although he was not a resident of the village. He only used the Manyenga "A" by virtue of being a member of the Irrigation Association of Manyenga "A", which he joined in 1997. He alleged that when he joined the canal membership, it was under the leadership of SD. The canal broke down in 1997, and Adriano joined in the canal repair, and he rose to the position of Assistant Secretary in the Irrigation Association. He further testified that, in 1998 misunderstandings arose when SD demanded and was given Tshs 150,000/= for his role in the founding of the canal. Adriano further contended that SD's Water Right was RBWO 96, whereas the canal they were building had 200 registered members, with a Water Right RBWO 102. The Primary Court, comprising of the Primary Court Magistrate and two Court Assessors visited the canal in dispute. The court found that SD had no claim over the registered canal RBWO 102, which the two respondents were building. In addition, the Primary Court noted that SD's Water Right (RBWO 96), had been revoked by the Rufiji Basin Water Office. SD lost his case and was ordered to pay the cost incurred by the two respondents. SD appealed to the District Court (Simon Dangala vs Ayubu Kanyamala and Adrian Tandika, Civil Appeal No. 2/ 2001). The District Court dismissed SD's appeal and noted that (a) The two respondents were given ownership of water registered as RBWO 102 as formal owners of Manyenga "A" Irrigators Association (b) Though it is true SD built the canal of Manyenga "A", he was compensated for the labour and costs he incurred.

Highlights and implications of proposed water reforms

The National Water Policy (2002) has not yet been incorporated into legislation. Water resources management in Tanzania is still governed by the Water Utilisation (Control and Regulation) Act No. 42 of 1974, which relates to the administration of granting of rights to water users. The regulations provide in detail for the granting of water rights, and determine water use fees for various water uses.

The new water policy proposed a number of measures, which may have an impact on prevailing customary water laws including:

Formation of Sub-Catchment/Sub-Basin Boards

The policy recognises that the extensive size of current water basins makes management of water resources at this scale a difficult task. The policy recommends the formation of sub-boards or sub-committees of water boards. These will be made up of representatives of public bodies, institutions and water users' associations in the area of the sub-catchment/committees of the board. Customary and traditional institutions are barely considered or mentioned. Even if traditional water management is incorporated, the functions of the sub-catchment/committees are likely to be more formal to include close management of the preparation and implementation of water use plans and resolution of any local water conflicts.

Involvement of district level water organs

The policy recommends close involvement of district councils and local government authorities in basin water boards and sub-catchment boards. These organs will offer expert advice to water users, protect natural resources of the village and Wards, make water resources management by-laws, and assist in resolution of disputes – hence, the district level organs will be part and parcel of the formal water resources management structure.

Involvement of Water Users' Associations and community level organs

The policy recommends the continuation of the current formal water users' associations. These groups will be formalized to include smallholder or small-scale users such as irrigation or furrow committees. According to URT (2002) these associations are regarded as the lowest levels of water resource management with the following responsibilities:

- management of water use from water rights
- preparation of water utilisation plans
- enforcement of the law
- pollution control and protection of water sources
- resolve local water conflicts
- collect data.

Among many important elements in the proposed water legislation is the charging for water and financing of water management, which has challenged by some recent commentators (van Koppen et al. 2004). The current water fee charges distinguishes between the domestic, economic and institutional users, and the amounts to be paid differ according to whether the application is for:

- water for domestic/livestock/ small scale irrigation/ fish farming;
- water for large-scale irrigation;
- water for economic use for domestic/livestock/ fish farming;
- water for irrigation and an economic activity;
- power royalty fees
- water for industrial uses
- Water for institutional/ regional centre and
- Water for mining activities.

Three separate pieces of legislation will result from the proposed legal framework to cover water resources management (URT 2004a), rural water supply (URT 2004b) and urban water supply and sewerage (URT 2004c). One important question for customary water law is whether the proposed pieces of legislation will enhance the place and position of customary law. This paper contends that new laws will not usher in any shift of the position and place of customary water law. The mainstream policies and laws will continue to regard customary laws as a transient system expected to die out. Because new statutory provisions will not reach out to all areas of the society, customary water laws of the various communities will continue to be resilient and policy makers will continue to contend with these laws where statutory laws have not reached.

We have noted that the proposed draft Bill on Water Resources Management will define 'customary water rights' to mean the rights and practices in relation to water resources that have been practised by communities or individuals since time immemorial in the belief that they create binding rights and obligations. Section 21 will take a step further to provide that customary rights held by any person or community in a watercourse shall be entitled to recognition and shall in every respect be of equal status and effect to a granted water right

When enacted, Water Resources Management will apply over all areas of Tanzania without regard to whether they are rural or urban. Apart from recognition, holders of customary water rights may apply to be recorded by a Basin Water Officer in favour of an individual, a family, a group of two or more individuals whether or not are associated together under any law - Sections 21 and 22 will allow any person, family unit, a group of persons recognised as such under customary law or who have formed themselves together as an association, cooperative society or as any other body recognised by any law which permits that body to be formed, to apply to the Basin Water Officer for grant of a water use permit. Customary water rights will also enjoy the following recognition:

- indefinite duration, although the water officer may set a duration upon the recording of such rights;
- governed by customary law in respect of any dealings, between persons using the water body within the authority or body having jurisdiction over the water resource or facility

Under the proposed changes, customary water rights may be subject to a premium or an annual payment, which may be varied from time to time. The new law will adopt the strategies of registrations and

recognition of associations of individuals under customary water laws. It is only after the operation of the proposed law would we know whether definitions and recognitions of customary water law would remove the tenuous state of customary rights to water. We should bear in mind that formal recognition of customary water rights occurs within the context of the statutory provisions conferring all property over water to the state.

The strategy vesting in the state all property over water in the country will continue to operate under the new pieces of legislation. This strategy can potentially be used to require the formalisation of traditional water abstractions. By legislating that "all property over waters in Tanzania belongs to the Republic" it means that access to various types of water can only be had through the procedures provided for under mainstream laws. Mainstream laws today exert control over customary water abstractions through the strategy of designation of certain rivers, streams, lakes and water sources to be controlled. Declaration is a water use control mechanism that can force customary systems into the mainstream

Customary land tenures have had a longer experience with mainstream attempts at their formalisations than customary water laws. Since the amendment of Land Ordinance of 1923 in 1928, formal land laws have on print recognised the existence of customary tenures. But reality in practice has left the position of these customary land laws tenuous, weak, and fragile and not fully substantiated. Any attempt at formalisation of customary water laws should have regard to the experience of formalisation of customary land tenures.

Insights from customary land tenure

The formalisation process of water rights can draw a number of lessons from the more articulated processes relating to land. Customary tenures have received clearer recognition in land laws than in water laws of Tanzania. Customary land tenures have been recognised by the repealed Land Ordinance of 1920s and also the current Land Act and Village Land Acts of 1999.

The Land Act and Village Land Acts have both made attempts to define customary land tenures away from any ethnic/tribal group. In his recent paper on customary tenure, Fimbo (2004) illustrates some of the strategies that mainstream statutory provisions use to formalize customary tenures. This formalization strategy is described as aimed "to ensure that existing (customary) rights in and recognized long standing occupation or use are clarified and secured by law." Fimbo points out that the Village Land Act (1999) uses the expressions "customary tenure," "deemed right of occupancy" and "customary right of occupancy" to secure existing and longstanding use over lands. Recent developments within land law indicate the desire of policy makers (through new statutory organs) to define customary laws away from ethnic traditions and grant formal customary tenures over land. "Customary right of occupancy" is for example under the Village Land Act 1999 granted to an applicant by a village council. Whereas a "deemed right of occupancy" refers to the land title of an indigene, that is to say the title of a Tanzanian citizen of African descent or a community of Tanzanian citizens of African descent using or occupying land under and in accordance with customary law.

Fimbo (2004) can discern from statutory provisions that generally customary tenures apply to all land whenever African communities have settled except in areas specifically excluded by legislation. Thus, though existence of customary tenure is now in terms of the Village Land Act, 1999 firmly rooted in the in game reserves, forest reserves, national parks and preserved areas, relevant formal authorities which retain power to regulate land use in those areas.

In safeguarding existing water rights of poor and marginalized villagers, the water sector could follow the same provisions as those which have guided the protection of customary land rights. However, it seems the policy makers in the water sector have been inspired by the neo-liberal principles that prevailed in the 1990s, which link everything to the individual rather than the community.

Alternatives to formal property rights

The debate about the role of property rights in natural resources management has recently come to the fore, thanks to De Soto's treatise on why capitalism triumphs in the West and fails everywhere else (De Soto 2000). According to him, up to 4 billion people are effectively excluded from participation in the global economy because their property rights are not recognized. They are thus deprived of legal identification, and the forms of business that are necessary to enter the global market place. However, while some people see the legalization of property rights as a vital step in the transformation of the informal economy and reduction of poverty, other scholars have raised doubting voices (e.g. Mathieu 2002; Mwangi, 2003; and Mwangi, 2004).

In the obsession with formalization and privatisation of property rights, it is often forgotten that in most rural areas of Sub-Saharan Africa, common property farmland, water, pastures and other resources often provide social security and substitute for missing insurance markets. People tend to forget that resources under common property can serve vital economic functions that individual property cannot. Not only may common property display lower transaction costs compared to private property under certain circumstances common property resources' role as insurance substitute often depend on secure and easy access to geographically dispersed resources. This is the case for management of resources where yields fluctuate widely across time and space. Herders in the arid and semi-arid tropics thus rely on common property to a very large extent because of the large spatial variability in rainfall, water and pasture, which makes it crucial to have access to very large areas. Thus, scholars such as Heltberg (2001) have argued that, "common property systems deserve respect for their management, equity and insurance functions. Policymakers should refrain from undermining common property systems, and should consider providing them with legal recognition and other forms of support". This paper explores both sides of the debate and recommend where formalization and privatisation may be appropriate, and where common property management may still be maintained. In discussing the process of formalisation of water rights in Tanzania, the following issues may draw immediate interest:

- the performance of private property regimes in relation to other property regimes (state, communal, open-access); and
- the implications of formalization and individualization of property rights for vulnerable groups.

While there is no doubt about the fundamental role played by formal property rights in shaping how people manage natural resources, the literature on legal pluralism has cautioned against static definitions of property rights. As it was noted by Meinzen-Dick and Pradhan (2001), policymakers are often influenced by approaches to property rights which regard these rights as unitary and fixed, rather than diverse and changing. This is the case in countries like Tanzania, where the government, prompted by increasing pressure on land and water resources, has been busy trying to establish formal legal systems, fixing property regimes and formalising informal arrangements through institutions such as River Basin Boards. In spite of governments' over-reliance on statutory arrangements for water resource management, a number of studies have highlighted the different roles played by both 'formal' and 'informal' institutions in water management (e.g. Boesen et al 1999). The inter-play between formal and informal institutions in natural resources management is also well captured by Meinzen-Dick and Pradhan (2001), and Derman and Hellum (2003), who have written about the implications of legal pluralism for water resource management.

Conclusions

This paper has traced the historical process of formalising customary law and related arrangements related to the use and management of water resources in Tanzania; then presented four case studies that display interactions between traditional water management systems and the modern, formal systems. The paper also highlighted the content of the proposed policy and legal changes, focusing on the extent to which the proposed legislative dispensation will protect the existing traditional or customary water rights – showing that, despite the early initiatives at providing space for the growth of customary law, the legal system pertaining in Tanzania today is tilted more in favour of formal than informal systems. The authors conclude that:

- the new water will not usher in any shift of the position and place of customary water law. The mainstream policies and laws will continue to regard customary laws as a transient system expected to die out.
- because new statutory provisions will not reach out to all areas of the society, customary water laws of the various communities will continue to be resilient and policy makers will continue to contend with these laws where statutory laws have not reached.
- the prevailing systems of customary water law involves not just utilisation of water but is closely linked to other external factors like markets for local products, injection of external capital (like irrigation), prevailing inheritance, legal system (system of local governance) and availability of mainstream courts operating outside the control of customary law institutions. Law reformers will have to contend with this diversity and conflicting interests and how it will affect the basin-wide water resources management.
- in order to protect the water rights of vulnerable and poor rural communities the formalisation process of water rights can draw a number of lessons from the more articulated customary land tenures.
- in carrying out water reforms, policy and lawmakers need also to explore alternatives to formal property rights, and in some cases, actually protect common property systems.
- unless development projects specifically engage with customary law, they are likely to marginalize and replace it. The repercussions of this could be negative for marginalized villagers who are not well placed to capture the benefits of the project.

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Notes

1. The London Conference on the Future of Law in Africa (1959-1960) was convened under the auspices of the Commonwealth Relations and the Colonial Office.
2. This conference was held under the auspices of the Faculty of Law, at the University College, and the Ministry of Justice.

International workshop on '*African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa*', 26-28 January 2005, Johannesburg, South Africa

Challenges of legislating for water utilisation in rural Tanzania: drafting new laws

Palamagamba John Kabudi

Mainland Tanzania is in a process of preparing new pieces of legislation that will govern and regulate the water sector. The drafting of the new laws is in line with the implementation of the National Water Policy (NAWAPO) which among other things calls for review of the existing institutional and legal framework and proposes legislative instruments according to the policy directives. The on-going exercise has posed several challenges in relation to the process of drafting new laws as well as the scope and content of the proposed laws. For the first time in the history of legislating for water supply in Tanzania, the issue of rural water supply has received a special attention both in the policy and in the legislation proposals. However, despite that encouraging development, there are still issues that need to be clarified on the governance and utilisation of water by rural population. How eventually the issues of rural will be adequately addressed, will depend very much on the active participation of the rural population and other concerned stakeholders in the on-going process.

Keywords: rural water legislation, governance, customary water law, water utilisation associations

Introduction

Mainland Tanzania is now in the process of preparing new pieces of legislation that will govern the management of water resources as well as water supply and sanitation. The process of preparing new pieces of legislation was preceded by the adoption of a new National Water Policy (NAWAPO). The Cabinet in July 2002 adopted the policy recommendations contained in NAWAPO which has a whole part dealing with rural water supply and sanitation. Mainland Tanzania has since 1974 been governed by the Water Utilization (Control and Regulation) Act, 1974. Since then new concepts and approaches to governance and utilization of water resources have emerged that need to be taken on board. NAWAPO replaces the Water Sector Policy of 1991 which addressed sources, use of water in the urban areas, planning and quantity of water supply, financing and maintenance of water operations, authorities responsible for water, and enforcement and coordination policies of the water sector.

Water has been explained as a natural resource that plays an important role in economic activities and it impacts on the health and sanitation of human communities (Wangwe, S.M., et. al (eds) 1998). Tanzania is reputed to have abundant water resources, which serve many uses including water supply to urban and rural areas. The country water resources have, in recent years, started to diminish in terms of quantity and quality and the water supply systems in urban and rural areas have also been plagued by series of operational and structural problems and hence failed to cope with the increased water supply and sanitation demands. One of the critical underlying factors for these failures has been identified as lack of clearly defined and comprehensive legal and institutional framework. As noted in the National Water Policy, 2002 (NAWAPO), "This legislation (i.e. the Water Utilization (Control and Regulation) Act, 1974) and associated regulations do not adequately meet present and emerging water resources management challenges. Thus the legislation needs to be reviewed in order to address the growing water management challenges" (NAWAPO: 48-49).

As noted earlier, the review of existing water legislation and drafting of the missing provisions in that legislation was deemed to be imperative and urgent. The Government through the River Basin Management and Smallholder Irrigation Improvement Project - River Basin Management Component financed the process of drafting the new pieces of legislation through a Consultancy Services on "Reviewing Water Resources, Urban Water Supply and Sewerage and Rural Water Supply Legislation".

The consultants who were chosen to undertake the assignment by the Ministry of Water and Livestock Development were required to prepare draft Bills for three pieces of legislation. These were the Water Resources Bill, the Urban Water Supply and Sewerage Bill and the Rural Water Supply and Sanitation Bill. The three draft Bills were prepared and submitted to the Ministry of Water and Livestock Development in June 2004. The draft Bills have been subjected to technical Government consultations and a national workshop. In response of recommendations of various stakeholders it has been decided by the Ministry of Water and Livestock Development that there should be two instead of having three new water legislation. As a result of the decision the Urban Water Supply and Sewerage Bill and the Rural Water Supply and Sanitation Bill are being merged into Water Supply and Sanitation Bill. Initially it had been argued that rural water supply needed its independent piece of legislation so as to give focus and importance like that which has been given to urban water supply. However after more consultation it has been decided that both urban and rural water supply be placed in the same piece of legislation so as to accord them equal status and attention the difference being on how they are managed.

The Colonial legacy and post-colonial marginalisation of customary law in Tanzania

The colonial legacy in relation to natural resource utilisation in Tanzania has continued to influence the post-colonial approach to the application of customary law. It does not need to be emphasised that one of the motivation of colonialism was not only to access the abundant natural resources in Africa but also to control them. Thus the advent of colonialism witnessed initially the appropriation of natural resources from the people and they were placed under the colonial state. This was followed by alienation of the people from the natural resources that they once owned. They were now required to have permits and licences to access and use the natural resources. The alienation process was coupled with the criminalisation of most of the traditional uses of such resources that were to a large extent governed by customary law. It was a criminal offence for natives to be seen in a natural resource protected area without a permit. Thus the application of customary law during the colonial period was tolerated only where it did not conflict with the interests of the colonial state. Customary was always subordinate to statutory laws enacted by the colonial state. Actually the application of customary law was more accepted in private matters such as marriage, inheritance and the like but not in the control and ownership of natural resources. It is statutory laws which prevailed and they clearly stipulated that all natural resources including water were vested in the Governor on behalf of the colonial state.

The colonial situation was not changed by the post-colonial state. The provisions vesting all natural resources in the state have been retained in statute books. What has changed is that they are now vested in the President as a trustee of all the citizens of Tanzania. Still access and use is regulated by statutory law and not by customary law. Indeed there have been changes in some areas especially of management of natural resources. Community based natural resources management is now accepted as the means to ensuring sustainable utilisation of natural resources. However things are easily said than practiced. It will take time to change the mindset of bureaucrats who were schooled that people are an anathema to management of natural resources and therefore should be kept out and be converts of community based natural resources management.

The initial euphoria by the new African governments after independence in the 60's to codify and apply customary law has fizzled and to a large extent died out. The codification exercise in Tanzania ended up with only the patrilineal tribes and it has ignored the matrilineal tribes who constitute 20% of the population of Tanzania. Even the codified customary law has never been reviewed and updated ever since the exercise was completed in 1963. More statutes have been enacted that have eroded the application of customary law in Tanzania. It needs to be pointed out that in 1963 the rule of the chiefs was abolished and thus removing traditional institutions which were applying customary law in regulating the resources that remained under their stewardship. This went hand in hand with the marginalisation customary dispute settlement institutions and their replacement by court system with powers to apply customary law and Islamic law. Discussion of application of customary law is today not a topic of interest as compared to the emerging trends in law that are being pushed by deregulation of the economy and securing the legal base for the participation of private sector.

It is a reality that despite researches that have been conducted on customary law on water the discussion of the application of customary law has not been given prominence that one would have expected in the drafting new water laws. It is interesting that one of the studies that the consultants were requested to undertake as part of the drafting process was on customary water law in Tanzania. That included making an analysis of relevant customary water laws so as to be able to identify the local informal water management systems operating today in Tanzania in the Basins and their interrelationship with the formal systems. The assignment included the identification of how customary laws and by laws provide for water allocation, tenure rights, conflict resolution and protection water resources and catchments as well as on how customary law can be used to effectuate the implementation of statutory law and how these could be used in specific cases.

Policy framework for reforms on water resources and supply in Tanzania

The government in adopting NAWAPO shows to be keen to improve the regulation of water supply and sanitation in both urban and rural areas. However that good intention will have to be measured by the extent that the interests of the rural areas are crafted and accepted in the new laws being formulated. It is not the first time that Tanzania has formulated a national water policy. What has changed is that the other policies which were promulgated when Tanzania was pursuing the policy of *Ujamaa na Kujitegemea* (Socialism and Self-Reliance). The current water policy has been adopted when Tanzania is pursuing free market economy and where the private sector is urged to be the driving engine of the economy. The language now is on how to attract private investment by providing them with incentives that will ensure return of their investment. The danger is the marginalisation of the fact that water is one of the basic needs and rights that needs to be secured also for the indigent urban population and the rural pollution.

The legal framework governing water supply is being reviewed as part of implementation of NWAPO. The legal framework is required to: define roles and responsibilities of various stakeholders; to secure investments made; augmenting private sector participation and legally recognizing water users' entities. The main thrust of the review of the water legislation therefore, takes cue from NAWAPO and the latter had adopted a two-pronged approach of separating water resources legislation from those of service provision.

For the proposed water resources legislation, NAWAPO recommends: that existing Water Act and regulations be reviewed and conflicting water related laws and regulations be identified and harmonized, and strengthening the mandates of Basin Water Offices to:

- enforce legislation and operating rules on water use and pollution control;
- collect water user charges
- facilitate the establishment of lower level water management organizations which will bring together users and stakeholders of the same source
- act as centres for conflict resolution in water use, allocation and pollution control.
- institutionalisation of relevant customary law and practice related to water management into statutes.

Overall, with regard to water resources management NAWAPO demands for the establishment of a "comprehensive framework for promoting the optimal, sustainable and equitable development and use of water resources for the benefit of all Tanzanians based on a clear set of guiding principles". The guiding principles have been outlined as:

- subsidiarity through decentralization
- equity amongst diverse stakeholders
- participation of stakeholders in use and decision making and;
- sustainability of the resources

NAWAPO promotes an integrated approach to water resources assessment, planning and development and development that takes into consideration the social, economic and environmental factors based on the above cited principles.

For rural water supply, NAWAPO objective is to improve health and alleviate poverty of the rural population through improved access to adequate and safe water. The policy aims at defining ownership and management structures of Rural Water Supply Schemes (RWSS). To do that the policy calls for:

- review of existing law under which rural water user entities can be legally registered
- strengthening private sector participation in water supply and sanitation services in rural areas
- dissemination of information of regulations pertaining to rural water supply and sanitation services

The Rural Water Policy objectives have been formulated from four main principles derived from experience gained in the implementation of the 1991 National Water Policy and of other developing countries (NAWAPO 2002:51). These are social principles, economic principles, environmental principles and sustainability. Under social principles NAWAPO promulgates that water is a basic need right and therefore accords first priority provision of water supply and sanitation services to basic human needs enjoying such use by rights. The policy further gives priority of investment in water supply and sanitation to areas which experience water scarcity and experience acute water shortage with an objective of satisfying human beings and livestock needs.

NAWAPO objective is to achieve sustainable development and delivery of rural water supply services. That calls for clear definition of the roles and responsibilities of various actors and stakeholders. Conditions precedent for a sustainable rural water supply are:

- supplying and managing water schemes at the lowest appropriate level.
- the establishment by beneficiaries themselves of the water schemes which they will own and manage.
- establishing a mechanism for full cost recovery maintenance and replacement
- facilitating availability of spare parts and know how for timely repairs and maintenance of the schemes through standardization of equipment and promotion of private sector involvements.
- protection of water sources areas.
- reconciling the choice of technology and the level of service with the economic capacity of the user groups.
- recognising the role of women as principle actors in the provision of rural water supply services.

The Policy objectives were set out following the existing situation. In 1971 the Government's twenty years Rural Water Supply Programme was launched with the objective of supplying every Tanzanian with safe and portable water within 400 meters. Notwithstanding reinforcement of UN Water Decade which was adopted by Tanzania, the target of supplying water to all by 1991could not be achieved. However in that year it was found that it was only less than 48% of the rural population which had clean and safe water. The said target was largely achieved through donor support which included among others DANIDA, SIDA, NORAD, TCRS, GTZ, KFW, FINNIDA and UNICEF.

In the 1995 Ministry's Water Sanitation Review it was recommended that:

- the government should ensure adequate funding of rural water supply schemes
- that cost sharing should be made obligatory.
- financial support be given to those ready to contribute financially towards the costs of construction and improvement.
- the government should encourage communities which want to manage their own water supplies and reduce over dependency on the government.
- there is need to encourage external support agencies to enhance funding of water projects.

It was further proposed that a new legislation should be enacted to govern management of rural water supplies with specific attention to private sector participation in the projects and ownership by communities.

Brief review of legislation on rural water supply in mainland Tanzania

Unlike the urban water supply sector the development of rural water supply sector legislation has been gradual in contrast to what has happened to the Urban Water Supply Sub sector. The Urban Water Supply Sub sector had the advantage of getting two pieces of legislation to regulate the water supply. The legislation are:

- the Urban Water Supply Act (Act No 7 of 1981)
- the Water Works Ordinance (Cap 281 of 1958)

Although the Urban Water Supply Act, 198 established the National Urban Water Authority with the main aim of managing urban water supply in all urban areas in the country the Authority operates only in Dar es Salaam, Kibaha and Bagamoyo. It also manages a two Kilometres corridor on either side of the transmission mains from both lower and upper Ruvu water plants. However, in certain circumstances the application of the said legislation in the rural areas could not be avoided.

The Waterworks Ordinance, Cap. 281 was enacted to provide for and regulate supply of water to the public. The Waterworks Ordinance has passed through two important stages of development. The first stage was prior to the amendments which were made pursuant to the provisions of Water Utilization (Miscellaneous Amendments) Act, 1997. The second stage comprises of reforms that have been implemented after the amendments. Initially the Minister was given the mandate by order, to declare any area defined in any such order to be a water supply area for the purposes of the Ordinance (section 5). The Ordinance further provided that the Minister may appoint a Water Authority for any water supply area and until such appointment is made for any such area the Engineer in Chief was supposed to be the Water Authority for that area (section 4). Further powers where given to the Minister if any special circumstances exist in a water supply area to provide by order in the Gazette that such of the powers, duties and functions of the Water Authority for such area as are specified in the order shall be exercised and performed by any person or persons other than the Water Authority.

Pursuant to the provision of Water Utilization (Miscellaneous Amendments) Act, 1981 Section 3 of the Waterworks Ordinance was repealed and replaced as follows:

- 3(1) The Minister may by order designate and declared any area define in any such order to be a Water Supply and Sewerage Board Authority for the purpose for the Ordinance.
- 3(2) The Minister may declare that the facilities and infrastructure used in rendering the above services be transferred to the declared Water Authority Board (section 4(2)).

The term Water Supply and Sewerage is defined by the Ordinance to mean: -

- in an urban area the area of jurisdiction of a City Council, a Municipal Council, a Town Council includes any urban areas other than a village, village settlement or a minor settlement.
- in rural areas, the areas within 400 metres of the existing distribution.

The effect of the amendments was that the powers of the Minister are confined to the City Council, a Town council, any urban area other than a village, village settlement or a minor settlement and an area within 400 metres of the existing distribution. This means that the application of the provisions of the Ordinance to the rural areas stopped. Prior to the amendments the Minister had powers to declare the rural areas to be Water Supply Areas.

In the exercise of the powers discussed in above up to the end of October 2003 the Minister declared a total of 38 district headquarters to be Water Supply and Sewerage Authorities out of which 27 have already formed water boards.

Few attempts were made in developing rural water supply legislation pursuant to the provision the Water Utilization (Control and Regulation) Act, 1974. Under the Act the Minister has been given the mandate to make regulations prescribing anything which may be prescribed under the Act for better carrying into effect of the provisions of the Act. The Minister in exercise of these powers made Water Utilization (General) Regulations to provide for among other things, for the formation function and conduct of the Water Users Associations. As a result 44 Water Users Associations have been formed and registered as legal entities and 22 are in different stages of registration (Maji Review, 2003:18). Under the said regulations the functions of the water user associations are to govern conservation, maintenance of works in the river in question and shall decide the assessment to be levied thereof and for the expenses of the association.

Similarly under the provisions of Section 38(2) of the Act the Ministers powers are limited to making rules and regulations for the formation functions and conduct of local associations of water users. It needs to be observed that though the registration of water users association has improved giving comfort to the Ministry and the beneficiaries in rural water supply and sanitation sector, the Act was not meant to be a legislation for rural water supply. It is therefore imperative to have a piece of legislation in place which will regulate the establishment, governance and operations of Water Users Associations.

The Local Government (District Authorities) Act, 1982 brought about further developments in the regulation of rural water supply. Under the Act all waterworks that were previously owned by the Government and institutions were vested with the District Councils and rural water supply operations and management became vested under the District Council Authorities (section 118(4) and First Schedule). The District Councils have been given the mandate to perform the functions specified under the First Schedule to the Act. Under Clauses 90-93 of the schedule the District Councils may among other things perform the following functions: -

- provide, establish, maintain and control public water supplies and impose water rates
- regulate or prohibit the sinking of wells and provide for closing of wells
- regulate or prohibit the construction and use of furrows
- prevent the pollution of water in any river, stream water course, well or other water supply in the area and for this purpose prohibit regulate or control the use of such water supply.

In view of the aforesaid background there is no specific legislation governing the Rural Water Supply Sub-Sector. The regulations or bye-laws made under various legislation do not adequately cover rural water supply and sanitation.

Issues in legislating for rural water supply

Issues that are addressed in the proposals for the rural water supply legislation are provided for in the NAWAPO. Taking into account the broad rural water supply sub-sector policy objectives which are to improve health and alleviate poverty of the majority of Tanzanians who live in the rural areas by improving access to adequate and safe water, the NAWAPO stipulated the following objectives:

- to provide adequate affordable and sustainable water supply services to the rural population.
- to define rules and responsibilities of various stakeholders.
- to attract the participation of the private sector in the delivery of goods and services.
- to involve the rural communities in contributing part of capital costs, and full cost recovery for operation and maintenance of services as opposed to the previous concept of cost sharing.
- to depart from the traditional supply driven to demand responsive approach in service provision.
- to manage water supplies at the lowest appropriate level as opposed to the centralized command control approach.
- to improve health through integration of water supply, sanitation and hygiene education.

The specific issues addressed in the proposed rural water supply piece of legislation include:

- ownership and management of the rural- water infrastructure
- sitting of rural water supply systems
- administrative and technical requirement
- water supply and sanitation services
- quality of water supplied to public through a public distribution system
- licensing of practitioners
- institutional aspects
- charging for water

Challenges and salient features in the proposed rural water supply legislation

The Rural Water Supply and Sanitation Bill addresses a number of issues as outlined in the Policy and contributions from stakeholders. As it has been explained the Ministry of Water and Livestock Development has decided that the Bill should be merged with the Urban Water Supply and Sewerage Bill into a Water

Supply and Sanitation Bill. The consolidated Bill will have a parts dealing with urban water supply and another addressing rural water supply. That means some of the provisions that are in the Rural Water Supply and Sanitation Bill will be retained in the consolidated Bill. The discussion below reviews some of the challenges and salient features of the Bill on rural water supply.

Ownership of water resources

As it is with other natural resources legislation, as well as the Water Utilization (Control and Regulation) Act, 1974 the proposed new water legislation vests the radical title on water to the United Republic. The Water Resources Bill proposes that all the waters in Tanzania are vested in the United Republic. This means that all water uses, with few exceptions provided under the law must be used with holders of water permits granted, as it is the case under the current Act where they are granted water rights. Therefore, the Bill does not envisage private ownership of water since state ownership of water resources is clearly stipulated under the Act and reiterated under NAWAPO. The Policy stipulates under Paragraph 4.1.1 that:

> "…all water in the country is vested in the United Republic of Tanzania and every citizen has an equal right to access and use the nation's natural water resources for his and the nations (sic) benefit"

Ownership and management of infrastructure

One of the critical issues in legislating for rural water supply in Tanzania is the ownership and management of infrastructure. As aforementioned in the previous parts of this paper there are quite a number of rural water supply projects which have been financed by donor funding. In such a situation to whom does the infrastructure constructed belong and who is responsible for their management. In order to ensure sustainability of rural water supply it is necessary that communities be vested with the ownership of the infrastructure. In order to ensure that communities become legal owners of water supply schemes legal registration of water entities the proposals have provisions placing ownership of water supply schemes including water wells to the communities.

Citing of rural water supply system

As in the case of urban water supplies, the draft Bill proposes that the regulation of rural water supplies should commence at source. Specification for the criteria for the citing of rural water schemes and protection of the system of works is important to ensure that the rural sector is not treated to sub-standard services. The law also will provide for pre-construction and post-construction screening of works and the necessary administrative and engineering requirements.

Administrative and engineering requirements for rural water supply

The Rural Water Supply Bill provides for the integration of water and sanitation services. It has provisions on design and development criteria which aim to ensure the following:

- pre and post-construction government screening of works
- consistency in quality of materials used, and in standards of workmanship;
- construction (and maintenance) of private connections to a public mains system;
- construction, operation and maintenance of works;
- management of the quality of water supplied to consumers.

Other factors to be taken into account in the Draft Bill are:

- environmental protection against possible degradation from the use of such water;
- provision of Environmental Impact Assessment
- implementation of demand responsive approaches;
- creation of water funds
- implementation of demand responsive approaches

Licensing of practitioners in rural areas

The draft Bill provides for minimum professional qualifications and procedures for licensing or registration of small-scale practitioners such as plumbers pump mechanics and masons. More specifically, the draft Bill provides for:

- selection criteria for applicants and their qualifications to be used by designated agency;

- registration, certification and categories of such practitioners.

Water service charging

As provided under NAWAPO, provision of rural water supply and sanitation services must ensure cost-recovery. Therefore the Bill has provisions that will provide a legal framework for the:

- pricing and financing mechanisms for rural water supply schemes and water funds;
- obligations of services recipient to pay for the same;
- level, rates , criteria and parameters to be taken into account in the calculation of the charges;
- procedure for the payment and collection of the charges (including arrears of such charges);
- option for waiver of charges.
- incidence of taxation laws on water charges, water supply equipment and treatment chemicals

Private sector participation in rural water supply

The private sector participation in rural water supply sanitation sub sector is provided for in NAWAPO. Tanzania has instituted economic reforms which ahs seen it moving away from centralised planned economy to free market economy. In implementation of economic reforms the private sector has been given a prominent role in the provisions of services. The Draft Bill has been trying to ensure there is flexibility and that a number of options and choices of form of private sector participation in the rural water supply. The choice will depend on their interest either in the existing water supply infrastructure or in the development of a new infrastructure. In the case of existing infrastructure invitation of the private sector in the management aims at enhancing efficiency and improvement of service delivery by injecting more capital into the existing water supply and sanitation infrastructure. The other area that the private sector is expected to play a big role is in the development of new infrastructure.

The mechanism for the private sector participation in the existing infrastructure and new infrastructure rural water supply to be developed or managed by the private sector can be through service contracts, management contracts, leases, concessions, and outright privatisation.

Governance of rural water supply

Issues of governance of rural water supply in Mainland Tanzania have been dodged with a number of problems. The tendency for many years was more based on centralisation of management of rural water supplies through the Central Government or donor agencies. Even after the institution of the policy of decentralisation by devolution in Tanzania still the tendency was to decentralise down only the district level ignoring the lowest levels. This has made the institutional framework for rural water supply to be an issue of intense debate. The balancing act between the role of the central government and the district councils on one hand and the community based water user associations is not yet concluded and it is being worked out in a strategy that is being prepared by the Ministry of Water and Livestock Development.

The decentralisation of the government functions to the regions and districts started in 1972. The decentralisation was aimed to transfer the decision making as well as implementation close to the communities. Most ministries had to decentralise their functions to the regions and districts. The government decided to abolish the local governments but in 1982 they were reinstated. The objective of creating local government authorities is stipulated under the Constitution of the United Republic of Tanzania which provides under Articles 145 and 146 among other things that:-

- there shall be established local government authorities in each region district, urban area and village in the United Republic.
- the Parliament shall enact law providing for the establishment of local government authorities their structure and composition sources of revenue and procedure for the conduct.

The Constitution further provides that the objectives of establishment of local government authorities are to transfer authority to he people in order to enable them to plan and implement development programmes within their respective areas. In the process decentralization at the regional level the Regional Commissioners play the same roles as Ministers while the Regional Administrative Secretaries play the role of Permanent Secretaries of Ministries.

The biggest challenge in the governance of rural water supply is to ensure that the village level and communities fully participate. There are still discussions on what will be the role of district councils in the management of rural water supply.

There is a general agreement that water user association should be main vehicle in the management of rural water supplies. An association is a legal entity registered under the provisions of the Societies Ordinance [Cap. 337). An association has similarities with Cooperative Societies. However, unlike cooperative societies which are subject to the control and interference by the Government through the Registrar of Cooperatives, they are autonomous. Water User Associations that are registrable under the provisions of the Societies Ordinance are to be registered with the Registrar of Associations who is under the Ministry of Home Affairs. However, under Section 38(2) (f) of Water Utilization (Control and Regulation) Act, 1974 the Minister has also been given the mandate to make regulations to provide for the formation, functions and conduct of local associations of water users. The associations are to be registered with the Ministry of Water. In both cases the societies registered are conferred with corporate status. They are capable of suing and being sued and owning property.

Customary water law and norms

Customary law refers to set of rules and norms practiced by a community over a long period of time and most often are not codified. These laws provide for a set of rights and duties to be observed by certain community and against outsiders.

In the case of water resources, various communities in Tanzania have a long history of practicing certain customary laws for management of such resources. Even in the advent of colonial invasion, customary water law continue to exist in parallel with statutory law. These traditional ethos and practices are deep rooted and have been found to be useful in resolving water use conflicts, defining water allocation for different local uses and provide for catchment protection.

The FAO Legislative Study No. 58- Readings on African Customary Water Law provides for an in-depth study of the dynamics of customary law in different African ethnic groups and some of them are from Tanzania. In some areas in Tanzania there are traditional/customary water rights practiced by rural communities that ensured sustainability of water resources. In some areas communities have customary laws/practices that bestowed them with ownership rights that exclude outsiders. Because these practices are established over the years, they are critical considerations that need to be reflected in the law for the better management and voluntary enforcement of the laws. Customary laws or practices, if consistent with statutory laws may also form the basis for community support for enforcement of statutory laws.

Currently the water resources laws do not make provisions for recognition of customary laws and practices. This is one of the gaps in the legislation that needs to be addressed. As noted elsewhere, “the non-recognition of traditional or customary water users is at the root of many water use conflicts.” (FAO: 1997) Even in cases where customary practices conflict with the objectives of the water resources laws, awareness and enforcement efforts may help to change the existing practice. There are proposals for provisions on the relevancy of customary law for water resources management and rural water supply service delivery. Customary water laws may provide relevant provisions on conflict resolution, community participation in the management of water resources and water allocation.

In trying to include the application of customary law the following tentative provisions were proposed for consideration for inclusion in one of the water laws being drafted. The decision of whether they will be adopted or not is not in the hands of the consultants but the Government and eventually the Parliament. The proposals are as follows:

Definition of customary rights

Customary rights mean the rights and practices I relation to water resources as have been practised by communities or individuals since time immemorial in the belief that they create binding rights and obligations.

Incidents of customary law water rights

(i.) Customary rights held by any natural person or community in a water resource shall be recognised and is in every respect of equal status and effect to a granted right and shall, subject to the provisions of this Act, be:-

(a) capable of being granted by a Basin officer to a citizen, a family of citizens, a group of two or more citizens whether associated together under any law.

(b) capable of being of indefinite duration.

(c) governed by customary law in respect of any dealings, between persons using the water body within the authority or body having jurisdiction over the water resource or facility.

may be granted subject to a premium and an annual payment, which may be varied from time to time

Grant and management of customary water right:

(1) A person, a family unit, a group of persons recognised as such under customary Law or who have formed themselves together as an association, cooperative society or as any other body recognised by any law which permits that body to be formed may apply to the Basin officer for grant of a water right.

(2) An application for a grant of a customary water right shall be:-

(a) made on a prescribed form,

(b) signed-

(i) by the applicant or

(ii) were the application is made by a family unit, by not less than two persons from the family unit or

(iii) where the application is by a group of persons recognised as such under customary law, by not less than two persons who are recognised by that law as leaders or elders of

(iv) where the application is by a group of persons formed into an association cooperative society or a body under a law which recognises that body, by not less than two duly authorised officers.

(v) A duly authorised agent of any of the applicants referred to in paragraph (i) to (iv)

(c) Accompanied by any document and information from the village council or any other information which may be prescribed.

(d) Accompanied by any fee which may be prescribed.

Determination for application of customary water right

(1) The Basin officer shall within ninety days of the submission of an application or within ninety days of submission of further information or a satisfactory explanation of it's non availability, determine the application.

(2) In determining whether to grant the right the Basin officer shall:-

(a) comply with the decisions that have been reached by any committee or other body on the adjudication of the water rights in the area which the subject of the application for a customary right.

(b) have special regard in respect of the equality of all persons, such as:-

(i) treat an application from a woman, or a group of women no less favourably than an equivalent application from a man, a group of men or a mixed group of men and women; and.

(ii) adopt or apply no adverse discriminatory practices or attitudes towards any woman who has applied for grant of a right.

(c) where the application is from person or a group of person:-

(i) the purpose for which the applicant is intending to use the right and whether that purpose accords with any village development or land use plan.

(ii) any other matters that may be prescribed

(3) The Basin officer shall after considering an application in accordance with subsection (2).

(a) grant the right applied for subject to any conditions which may be prescribed or

(b) refuse to grant the right to the applicant.

(4) where an application is refused, the Basin officer shall, at the request of the applicant, furnish that applicant with a statement of reasons for the refusal.

Grant of customary water right

(1) Where a contract for a grant of a right has been concluded the Basin officer shall within ninety days of that conclusion grant a right to the applicant who accepted the offer by issuing a certificate to the applicant
(2) A certificate shall be:-
 (a) in a prescribed form
 (b) signed and sealed by the Basin officer.

Enactment of By-laws

(1) The village Councils shall enact by laws in their areas of jurisdiction that shall manage and resolve conflicts in respect of persons with customary rights in accordance to the traditional customs of the particular area.

Establishment of water user associations:

(1) Any group of households using a specific water point may apply as a body corporate for registration as a water user association on a prescribed form to the Basin Officer.
(2) Membership in water user association shall be open to individuals or households who regularly use a specific water point for their water supply needs; provided that an individual or household may be a member of more than one water association if the individual or association regularly uses more than one water point.
(3) Every water user association shall consist of not less than five and not more than ten members one of whom shall be the secretary.
(4) The members of the water users association shall be elected by the persons in community who use the water point.
(5) Each member of the water user association shall hold office for a term of two years and shall be eligible for re election on the expiration of his term of office.
(6) The water user association shall manage and maintain the water point in its area of jurisdiction.
(7) The water user association shall initiate water schemes including water wells where it deems fit to do so.

Concluding remarks

The finalisation of the provisions of water legislation is very crucial in ensuring that the concerns and interests of rural dwellers are genuinely addressed. Fortunately the legislative process in Tanzania has made public hearings mandatory at the level of standing parliamentary committees and they are open to every body that wants to participate. The experience in the process of enacting the Land Act, 1999 and the Village Land Act, 1999 in Tanzania has shown that where people are organised and consistent in pushing their arguments leads the Parliament enact a law that takes into account interests of the people. In the case of the land laws it was the women civil society organisations which took the lead in pushing for reforms. Equally in the case of water laws if the women civil society will appreciate that water is as critical as land to women interest in Tanzania and champion the cause it will help in shaping the laws to the interest not only of women but the entire rural population and the indigent urban population.

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Kenya's new water law: an analysis of the implications for the rural poor

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This paper analyses the implications of Kenya's Water Act 2002 for the rural poor in the management of water resources and delivery of water services. The paper is premised on the belief that pluralistic legal frameworks are necessary for the effective management of water resources and delivery of water services to this group. The paper argues that, to the extent that the Water Act 2002 depends on state based legal frameworks, its effectiveness in meeting the needs of the rural poor will be limited, particularly given the limitations of technical and financial resources facing the Kenyan state. Consequently, it is necessary that a conscious policy of pursuing use of the limited opportunities the law presents be adopted in order to maximize the law's potential in meeting the needs of the rural poor.

Keywords: Kenya's water law, rural water supply, water services, water resources management, rural poor, legal pluralism

Background

The present institutional arrangements for the management of the water sector in Kenya can be traced to the launch in 1974 of the National Water Master Plan whose primary aim was to ensure availability of potable water, at reasonable distance, to all households by the year 2000. The Plan aimed to achieve this objective by actively developing water supply systems. To do so required that the Government directly provide water services to consumers, in addition to its other roles of making policy, regulating the use of water resources and financing activities in the water sector. The legal framework for carrying out these functions was found in the law then prevailing, the Water Act, Chapter 372 of the Laws of Kenya.

In line with the Master Plan, the Government upgraded the Department of Water Development (DWD) of the Ministry of Agriculture into a full Ministry of Water. DWD embarked on an ambitious water supply development programme. By the year 2000, it had developed, and was managing, 73 piped urban water systems serving about 1.4 million people and 555 piped rural water supply systems serving 4.7 million people.

In 1988 the Government established the National Water Conservation and Pipeline Corporation (NWCPC), as a state corporation under the State Corporations Act, Chapter 446 of the Laws of Kenya, to take over the management of Government operated water supply systems that could be run on a commercial basis. By 2000 the NWCPC was operating piped water supply systems in 21 urban centres serving a population of 2.3 million people and 14 large water supply systems in rural areas serving a population of 1.5 million people.

Alongside the DWD and the NWCPC the large municipalities were licensed to supply water within their areas and by the year 2000, ten municipalities supplied 3.9 million urban dwellers.

Additionally, about 2.3 million people were receiving some level of service from systems operated by self-help (community) groups who had built the systems, often with funding from donor organizations and technical support from the district officers of the Department of Water Development (Government of Kenya, 1999).

Persons not served under any of the above arrangements did not have a systematic water service, and had to make do with such supply as they were able to provide for themselves, typically by directly collecting water from a watercourse or some other water source on a daily basis. Indeed, despite the Government's ambitious

water supply development programme, by 2000, less than half the rural population had access to potable water and, in urban areas, only two thirds of the population had access to potable and reliable water supplies.

In the 1980s the Government begun experiencing budgetary constraints, and it became clear that, on its own, it could not deliver water to all Kenyans by the year 2000. Attention therefore turned to finding ways of involving others in the provision of water services in place of the Government, a process that came to be known popularly as "handing over."

There was general agreement over the need to hand over Government water supply systems but much less agreement over what it meant for the Government to hand over public water supply systems to others. In 1997 the Government published a manual giving guidelines on handing over of rural water supply systems to communities (Ministry of Land Reclamation, Regional and Water Development, 1997).

The Manual indicated that "… at the moment the Ministry is only transferring the *management* of the water supply schemes. The communities will act as custodians of the water supply schemes, including the assets, when they take over the responsibility for operating and maintaining them." But, the goal of community management should be *ownership* of the water supplies, including the associated assets.

The Manual stated the criteria for handing over to be the capacity of the community to take over; ability to pay; capacity to operate and maintain the system; involvement of women in management; and ability and willingness to form a community based group with legal status. By 2002 ten schemes serving about 85, 000 people had been handed over under these Guidelines, focusing on management and revenue collection, not full asset transfer.

Building on this experience, the Government developed a full fledged policy, The National Water Policy, which was adopted by Parliament as Sessional Paper No 1 of 1999.

The Policy stated that the Government's role would be redefined away from direct service provision to regulatory functions: service provision would be left to municipalities, the private sector and communities. The Policy also stated that the Water Act, Chapter 372 would be reviewed and updated, attention being paid to the transfer of water facilities. Regulations would be introduced to give other institutions the legal mandate to provide water services and to provide mechanisms for regulation.

The Policy justified handing over, arguing that ownership of a water facility encourages proper operation and maintenance: facilities should therefore be handed over to those responsible for their operation and maintenance. The Policy stated that the Government would hand over urban water systems to autonomous departments within local authorities and rural water supplies to communities.

While developing the National Water Policy, the Government also established a National Task Force to review the Water Act, Chapter 372 and draft a Bill to replace the Water Act, Chapter 372. The Water Bill 2002 was published on 15th March 2002 and passed by Parliament on 18th July 2002. It was gazetted in October 2002 as the Water Act, 2002 and went into effect in 2003 when effective implementation of its provisions commenced.

The reforms of the water act 2002

The Water Act 2002 has introduced comprehensive and, in many instances, radical, changes to the legal framework for the management of the water sector in Kenya. These reforms revolve around the following four themes: the separation of the management of water resources from the provision of water services; the separation of policy making from day to day administration and regulation; decentralization of functions to lower level state organs; and the involvement of non-government entities in the management of water resources and in the provision of water services. The institutional framework resulting from these reforms is represented diagrammatically in Figure 1.

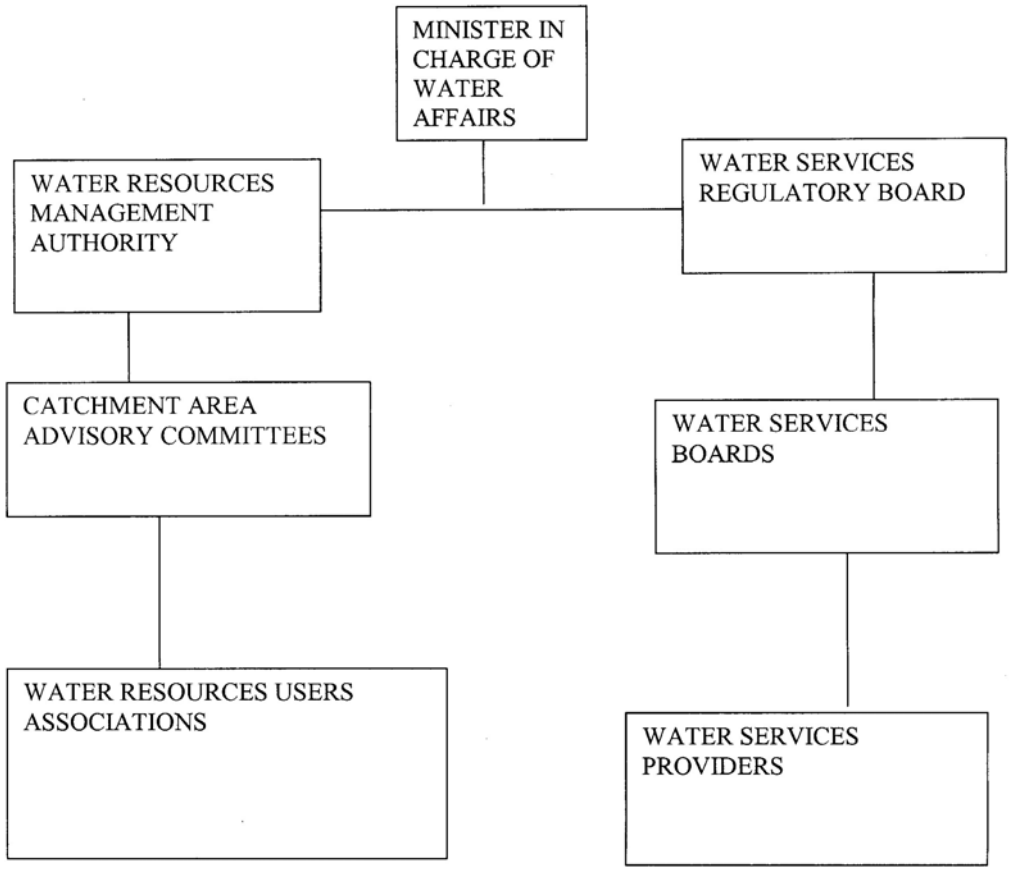

Figure 1. Diagrammatic representation of the new institutional structure for the management of water affairs in Kenya

Separation of functions

The Water Act 2002 separates water resources management from the delivery of water services. Part III of the Act is devoted to water resources management while Part IV is devoted to the provision of water and sewerage services. It establishes two autonomous public agencies: the one to regulate the management of water resources and the other to regulate the provision of water and sewerage services.

The Act divests the Minister in charge water affairs of regulatory functions over the management of water resources. This becomes the mandate of a new institution, the Water Resources Management Authority (the Authority), established in section 7 of the Act. The Authority is responsible, among other things, for the allocation of water resources through a permit system. The framework for the exercise of the water resources allocation function comprises the development of national and regional water resource management strategies which are intended to outline the principles, objectives and procedures for the management of water resources.

Similarly, the Act divests the Minister in charge water affairs of regulatory functions over the provision of water and sewerage services and vests this function in another public body, the Water Services Regulatory Board (the Regulatory Board), which is created in section 46. The Regulatory Board is mandated to licence all providers of water and sewerage services who supply water services to more than twenty households. Community managed water systems therefore need to obtain a licence from the Regulatory Board to continue providing water to their members. This is a departure from the practice previously prevailing under which community water systems, unlike the other systems, operated without a licence.

Decentralization of functions

The Water Act 2002 decentralizes functions to lower level public institutions. It does not, however, go as far as to devolve these functions to the lower level entities: ultimate decision making remains centralized.

With regard to water resources management, section 14 of the Act provides that the Authority may designate catchment areas, defined as areas from which rainwater flows into a watercourse. The Authority shall formulate for each catchment area "a catchment area management strategy," which shall be consistent with the national water resources management strategy. Section 10 states that the Authority shall establish regional offices in or near each catchment area. Section 16 provides that the Authority shall appoint a committee of up to fifteen persons in respect of each catchment area to advise its officers at the appropriate regional office on matters concerning water resources management, including the grant and revocation of permits. The regulatory functions over water resources management currently performed by the district offices of the Ministry in charge of water affairs are supposed, under the new legal framework, to be transferred to the catchment area offices of the Authority.

With regard to the provision of water and sewerage services, section 51 of the Act establishes water services boards whose area of service may encompass the area of jurisdiction of one or more local authorities. A water services board is responsible for the provision of water and sewerage services within its area of coverage, and, for this purpose, it must obtain a licence from the Regulatory Board. The water services board is prohibited by the Act from engaging in direct service provision. The board must identify another entity, a water service provider, to provide water services as its agent. The law allows water services boards, however, to provide water services directly in situations where it has not been able to identify a water services provider who is able and willing to provide the water services. Water services boards are regional institutions. Their service areas have been demarcated to coincide largely with the boundaries of catchment areas.

The role of non-government entities

The Water Act 2002 has continued – and even enhanced - a long standing tradition in Kenya of involving non-government entities and individuals in the management of water resources as well as in the provision of water services.

The Act envisages the appointment of private individuals to the boards of both the Authority and the Regulatory Board. Rule 2 of the First Schedule to the Act, which deals with the qualification of members for appointment to the boards of the two public bodies states that, in making appointments, regard shall be had to, among other factors, the degree to which water users are represented on the board. More specifically, subsection 3 of section 16 states that the members of the catchment advisory committee shall be chosen from among, *inter alia*, representatives of farmers, pastoralists, the business community, non-governmental organizations as well as other competent persons. Similarly, membership on the board of the water services boards may include private persons.

Most significantly however, the Act provides a role for community groups, organized as water resources users associations, in the management of water resources. Section 15(5) states that these associations will act as fora for conflict resolution and cooperative management of water resources. With regard to water services, section 53(2) stipulates that water services shall only be provided by a water service provider, which is defined as "a company, non-governmental organization or other person providing water services under and in accordance with an agreement with a licensee [the water services board]." Community self-help groups providing water services may therefore qualify as water services providers. In the rural areas where private sector water service providers are likely to be few, the role of community self-help groups in the provision of water services is likely to remain significant, despite the new legal framework.

The role of non-government entities in the management of water resources and in provision of water services is thus clearly recognized. However, given the state centric premise of the Water Act 2002, the role assigned to non-government entities, particularly self-help community groups, is rather marginal.

The Water Act 2002 and state centricism

In our view the Water Act 2002 is based on a notion of law which is unitary and state-centred. Its design and operation are premised on the centrality (indeed monopoly) of central state organs and state systems in the management of water resources as well as in the provision of water and sewerage services. It makes only limited provision for reliance on non-state based systems, institutions and mechanisms. More fundamentally, the new law continues the tradition of the law which it replaces of not recognizing the existence in Kenya of a pluralistic legal framework. It assumes that the legal framework in Kenya is comprised of a monolithic and uniform legal system which is essentially state centric in nature.

The continued denial of the existence in Kenya of a pluralistic legal framework is, in our view, inimical to the success of the new law in meeting the needs of the rural poor, who, more than urban based Kenyans, live within a legally pluralistic environment. For this purpose legal pluralism is understood as referring to a situation characterized by the co-existence of multiple normative systems all experiencing validity (see for instance (von Benda-Beckman, et al, 1997). Kenya's rural poor, typically, live within normative frameworks in which state based law is no more applicable and effective than customary and traditional norms. The new water law, however, ignores this reality.

The long title of the Water Act 2002 states that it is:

> "An Act of Parliament to provide for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water; to provide for the regulation and management of water supply and sewerage services …and for related purposes."

Part II of the Act deals with ownership and control of water. Section 3 vests "every water resource" in the State. "Water resource" is defined to mean "any lake, pond, swamp, marsh, stream, watercourse, estuary, aquifer, artesian basin or other body of flowing or standing water, whether above or below ground." The effect of this provision, therefore, is to vest ownership of all water resources in Kenya in the State.

The right to use water from any water resource is also vested in the Minister. Accordingly, section 6 states that

> "no conveyance, lease or other instrument shall be effectual to convey, assure, demise, transfer, or vest in any person any property or right or any interest or privilege in respect of any water resource, and no such property, right, interest or privilege shall be acquired otherwise than under this Act."

The right to use water is acquired through a permit, provision for which is made later in the Act. Indeed the Act states that it is an offence to use water from a water resource without a permit.

Section 4 of the Act deals with control of water resources. It states that the Minister shall have, and may exercise, control over every water resource. In that respect, the Minister has the duty to promote the investigation, conservation and proper use of water resources throughout Kenya. It is also the Minister's duty to ensure the effective exercise and performance by authorities or persons under the control of the Minister of their powers and duties in relation to water.

The state centricism of the Water Act 2002 is self-evident. It has vested all water resources in the country in the State, centralised control of water resources in the Minister and subjected the right to use water to a permit requirement. This has far reaching implications for the management of water resources and provision of water services to the rural poor who have only limited access to state based systems. Matters are compounded by the administrative, financial and technical constraints inhibiting the ability of the Kenyan state to implement the Water Act 2002 and to enable rural household to derive full benefits from its provisions.

The acquisition and exercise of water rights

As indicated the Act imposes a permit requirement on any person wishing to acquire a right to use water from a water resource. Section 27 makes it an offence to construct or use works to abstract water without a permit. There are however three exceptions to the permit requirement. These relate to minor uses of water

resources for domestic purposes; to uses of underground water in areas not considered to face groundwater stress and therefore not declared to be groundwater conservation areas; and to uses of water drawn from artificial dams or channels, which – being artificial rather than natural - are not considered to be water resources of the country.

The application for the permit is made to the Authority. Section 32 stipulates the factors to be taken into account in considering an application for a permit. These include:

- The existing lawful uses of the water;
- Efficient and beneficial use of the water in the public interest;
- The likely effect of the proposed water use on the water resource and on other water users;
- The strategic importance of the proposed water use;
- The probable duration of the activity for which the water use is required;
- Any applicable catchment management strategy; and
- The quality of water in the water resource which may be required for the reserve.

These considerations are designed to enable the Authority balance the demands of competing users, but also to take into account the need to protect the general public interest in the use of water resources as well as the imperative to conserve water resources.

Further guidance is given to the Authority in deciding on allocation of the water resource as follows:

- That the use of water for domestic purposes shall take precedence over the use of water for any other purpose – including agricultural purposes - and, in granting a permit, the Authority may reserve such part of the quantity of water in a water resource as is required for domestic purposes; and
- That the nature and degree of water use authorized by a permit shall be reasonable and beneficial inrelation to others who use the same sources of supply.

Permits are given for a specified period of time. Additionally, the Authority is given power to impose a charge for the use of water. The charge may comprise both an element of the cost of processing the permit application as well as a premium for the economic value of the water resources being used. Charging a premium for the use of water resources represents the use of charging as a mechanism for regulating the use of water. It is made possible by the fact that ownership of water has been vested in the State, which is entitled to grant and administer the right to use water resources.

As stated earlier the permit system is state centric in orientation. In operation, it privatizes water rights to a small section of the community, essentially property owners who are able to acquire and use water resource permits. By the same token, it marginalizes from the formal statutory framework poor rural communities who are unable to meet the requirements for obtaining a permit, principally land ownership.

Permits run with the land. Section 34 requires that a permit specify the particular portion of any land to which the permit is to be appurtenant. The permit passes with the land on transfer or other disposition. Where the land on which the water is to be used does not abut on the watercourse the permit holder must acquire an easement over the lands on which the works are to be situated. It is thus not possible, under the law, to obtain a permit in gross (i.e., which is not linked to particular land).

This provision reinforces the predominance of landowners with regard to the use of water resources. It is premised on a land tenure system which prioritizes documented individual or corporate ownership of land over communal systems of access to land and land use which do not require documented title, such as exist in most parts of rural Kenya. The Act therefore marginalizes collectivities, such as poor rural community groups in the acquisition and exercise of the right to use water resources. This potentially could undermine the ability of poor rural communities in Kenya effectively to utilize water resources in economically productive activities such as irrigation and commercial livestock rearing. Given the pluralistic land tenure system prevailing in Kenya, this issue will influence the in the effectiveness of the implementation of the new water law.

Kenya's land tenure systems

In Kenya three land tenure systems apply: government lands, trust lands and private lands. These land tenure systems are provided for in a series of statutes dating back to early colonial days.

In traditional Kenyan society, before the advent of colonial rule, land was owned on a communal basis by small community groups. Individuals and families acquired use rights and rights of access to land by virtue of membership to a social unit, such as a clan. Rights of access and use operated for all practical purposes as title to land, even though there was no documented title.

Following the declaration of a protectorate status over Kenya in 1895, the British colonial government passed the Crown Lands Ordinance to provide a legal basis for alienation of land to white settlers. The Ordinance declared "all waste and unoccupied land" to be "Crown Land." By a 1915 amendment of the Crown Lands Ordinance, Crown lands was re-defined to include land that had hitherto been occupied and owned by the natives. Further, in 1938, the Crown Lands (Amendment) Ordinance excised native reserves which became vested in the Native Lands Trust Board. A Native Lands Trust Ordinance was passed to provide for this and for the control and management of "trust lands." After independence these lands became vested in county councils.

In the 1930's and 1940's the colonial Government adopted the policy of enabling Africans to obtain documented title to land as a way of promoting better agricultural productivity. The Swynnerton Plan of 1955 recommended the consolidation and registration of fragmented pieces of land held by Africans into single holdings that could be economically farmed.

The Native Lands Registration Ordinance was passed in 1959, under which Native Land Tenure Rules were made. These authorized the alienation of trust lands to individual members of the native communities. This required the ascertainment of the entitlements of the individuals to the portions of land to which they laid a claim, the registration of the entitlements in the names of the individuals and the issuance of title documents. To facilitate this the Land Adjudication Act was enacted. Lands within the native areas (trust lands) that were not alienated remained trust lands, while lands outside of trust lands that had not been alienated to private individuals and entities remained "crown land" and later became known as government lands. Three land tenure systems thus arose: government land, trust land and private land.

The Government as a landowner can obtain a water resources permit with respect to its land, but the Water Act, 2002 exempts state schemes from the requirement for a permit.

Under the Constitution and Trust Lands Act, Chapter 288, trust lands are held by county councils for the benefits of the ordinary residents of the county council. Currently, trust lands comprise what remains of lands that were designated as native reserves. Currently, these lands are predominantly in the arid and semi-arid areas of Kenya, occupied by semi-nomadic pastoralist communities. The Constitution stipulates that County Councils "shall give effect to the rights, interests, and other benefits in respect of trust land as may, under the African customary law for the time being in force and applicable thereto be vested in any tribe, group, family, or individual."

In effect therefore, the trust land tenure system contemplates the continued operation of customs and traditions granting land use rights and access systems without the necessity for formal documents of title. This means that occupiers of trust land – who comprise largely the rural poor – would not be able to demonstrate ownership of land for purposes of an application for a water permit as required by the Water Act 2002. Consequently, the effective operation of the Water Act, 2002 is dependent of the implicit recognition in practice of a legally pluralistic land tenure regime, which the Water Act 2002 has not expressly done.

Private land is registered under either the Land Titles Act, Chapter 281 of the Registration of Land Act (RLA), Chapter 300. The RLA provides for the issuance to land owners of a title deed, and in cases of leasehold interests, a certificate of lease, which shall be the only prima facie evidence of ownership of the land. The RLA provides that the registration of a person as the proprietor of land vests in that person the absolute ownership of that land together with all rights and privileges belonging or appurtenant thereto and free from all other interests and claims whatsoever.

Land registration, granting private ownership, has been completed in those regions of the country with high agricultural potential whereas in the areas in which pastoralism is predominant communal tenure is recognized by the law. But despite the registration of land in the names of private individuals empirical evidence suggests that, even in high agricultural potential areas, among rural communities, land use and access rights continue to be based largely on customary and traditional systems, statutory law, notwithstanding. Indeed studies have revealed what one author has described as "a surprising recalcitrance of indigenous institutions and land use practices." (Migot-Adhola et al, 1990).

The widespread application of traditional and customary rights over even registered land can therefore be explained on the basis of the existence of a pluralistic legal framework with respect to land tenure. Indeed, rural communities tend to assume that the individuals registered as owning the land hold it in trust for other family or clan members, in line with customary practices. The discovery that, following registration, the registered land owner holds the land absolutely, and free from the claims of other family members, has led to a great deal of social upheaval, insecurity of title and access rights access and to much court litigation. To date local beliefs and practices have not changed significantly.

The absolute nature of the private ownership is qualified under section 30 of the RLA which states that that all registered land shall be subject to such of the overriding interests as may for the time being subsist and affect it, even if not recorded on the register, including-

a. Rights of way, rights of water and profits subsisting at the time of first registration under the Act; and
b. Natural rights of light, air, water and support.

Consequently, rights of access to water under traditional and customary laws subsist despite the registration of a private individual as an absolute owner of land. Such rights need therefore to be taken cognizance of in allocating water rights under the permit system established by the Water Act, 2002, even if the Water Act 2002 makes no reference to them.

The implication of the existence of a pluralistic land tenure regime for the administration and the Water Act 2002 and the management of water resources is that the sections of rural communities who have documents title to their land will be able to meet the requirements of the Water Act, 2002 for purposes of acquiring a water rights through a permit. Rural communities practicing communal land tenure systems are unlikely to be able to operate within the straight jacket of the Water Act 2002. It is likely that the latter comprise predominantly the rural poor.

The acquisition and operation of a water supply licence

The right to provide water services is also subject to licensing requirements. Section 56 states that no person shall provide water services to more than twenty households or supply more than twenty five thousand litres of water a day for domestic purposes - or more than one hundred thousand litres of water a day for any purpose - except under the authority of a licence. Indeed subsection (2) stipulates that it is an offence to provide water services in contravention of the licence requirement.

Consequently, community groups must obtain a licence in order to be able to continue or commence supplying water to their members. This is likely to have far reaching implications for member based rural water supplies, given the requirement for technical and financial competence, which are a precondition to obtaining a licence. Many such groups will likely have great difficulty demonstrating such competence, ad this may result in water service agreements being granted only to well established community groups and other organizations which have access to technical and financial resources to the detriment of local community – self –help - initiatives.

Section 57 provides that an application for a licence may be made only by a water services board, which therefore has a monopoly over the provision of water services within its area of supply. As earlier indicated however the water services board can only provide the licensed services through an agent known as a water services provider, which can be a community group, a private company or a state corporation which is in the business of providing water services.

In order to qualify for the licence the applicant must satisfy the Board that:

- Either the applicant or the water services provider by whom the services are to be provided has the requisite technical and financial competence to provide the services;
- The applicant has presented a sound plan for the provision of an efficient, affordable and sustainable service;
- The applicant has proposed satisfactory performance targets and planned improvements and an acceptable tariff structure;
- The applicant or any water services provider by whom the functions authorized by the licence are to be performed will provide the water services on a commercial basis and in accordance with sound business principles; and
- Where the water services authorized by the licence are to be provided by a water service provider which conducts some other business or performs other functions not authorized by the licence, the supply of those services will be undertaken, managed and accounted for as a separate business enterprise.

Unlike with respect to a permit for the use of water resources, there is no property in a water services provision licence, and, as stipulated in section 58(2), the licence shall not be capable of being sold, leased mortgaged, transferred, attached, or otherwise assigned, demised or encumbered.

Ownership of the assets for the provision of water services is vested in the water services board, which is a state corporation. Under section 113 provision is made for the transfer of assets and facilities for providing water services to the water services boards. Where the assets and facilities belong to the Government they are required to be transferred outright to the water services boards. Where, on the other hand, the assets and facilities belong to others, including local authorities and community groups, only use rights may be acquired by the water services boards.

The likely effect of this provision is that water services boards will be inclined to reach agreements with those community groups which have their own assets. Those community groups without assets – mostly, the most marginalized rural communities - are likely to find that their ability to develop water services facilities will diminish over time as funding for infrastructure development is channeled increasingly to water services boards directly, rather than to communities. Further, in order to be able to enter into contracts for the provision of water services as an agent of the water services board, the entity concerned needs to be legal person, which – as we shall show below - many poor community self help groups are not.

Local Community Water Systems

As already indicated, by the year 2000, less than half the rural population had access to potable water and, even in urban areas, only two thirds of the population had access to potable and reliable water supplies. Typically the people without access to reliable water services often represent the poorest and most marginalized of Kenyan people. This paper is premised on the belief that these are the people least likely to take advantage of, and benefit from, the legal framework in the Water Act 2002 for the provision of water services, and the ones likely to suffer most from inadequate management of water resources.

The ability of rural communities to provide water services through community groups is demonstrated by the fact that presently no less than 2.3 million people get water services from systems operated by self-help (community) groups – traditionally known as “water users associations.” These systems are diverse in nature and capacity, ranging from fairly sophisticated systems with well structured tariffs to simple gravity schemes operated without any formal processes (Njonjo, 1997).

The history of community provision of water services in Kenya is a long one. The majority of the systems are small in scale, serving perhaps one constituency and serving between 500 and 1000 families. Even in the areas served the systems rarely serve everyone, tending to be restricted to those who qualify as members according to criteria stipulated for the system by its initiators.

The phrase “self-help” – which is often used to describe these systems – is an apt one. Many arose out of the initiative of a small group of visionary and energetic community members who sought to redress the lack of water services in their local community whether for domestic water consumption strictly speaking or for irrigation or both. Typically, these individuals or group of individuals would have approached some or other

donor organization, church group or even community members living abroad, and successfully negotiated funding support.

Typically, it was condition of donor support that the community make a contribution of up to 15% of the cost of the project in labour and cash. The organizers of the project would then have had to raise funds from community members and other well wishers through a system commonly described in Kenya as a "*harambee*" in which people get together once, or more commonly, repeatedly to raise funds from members of the public for a community development – or other - project. Additionally, members of the community in which the project was to be constructed would have contributed to the cost of the project "in kind," that is, by providing direct manual labour at the site in digging trenches, carrying and laying pipes, backfilling and doing other non-skilled tasks.

Another important element of the community's contribution to the project has often taken the form of a donation of land for the physical facilities, such as the storage tanks and reservoirs, the treatment facilities and even the standpipes. Donations of land are often a contribution by one of the initiators of the project, as a gesture of support for the project. It is not unusual to find that the title to the land – if one exists - remains in the name of the person donating the land, even though for all practical purposes the person ceases to be the owner of the land in question, and the land is perceived as being communal in ownership. The common reason for the failure to transfer the land formally to the community often relates to the lack of a corporate entity into whose name to transfer the land, the cumbersome nature of the paperwork and the expense involved in effecting the transfer, as well as the belief by the community members and the land owner that the transfer is as good as complete with the verbal donation of the land by its owner.

Typically technical input into the design and supervision of the project has been provided by the water engineers stationed at the local district office of the ministry in charge of water affairs. Indeed, the Ministry's policy over the years has been to encourage its officers, as part of their official duties, to provide technical and backstopping support to community projects, at no cost to the communities. The actual construction of the water system however is often carried out by private constructors paid for by the donor organization and the community group.

Given these origins, the formal ownership of these community systems under formal statutory frameworks is far from clear. They are truly "community systems" in the sense that many have contributed to their development in one way or another, but no one contributor can lawfully claim formal ownership of the system. Legal disputes over ownership are rarely, if ever, heard of, and, in the experience of the writer, those involved in the development and management of these systems do not perceive this as being of significance. That the question of ownership is not perceived as being an issue in Kenya can only be explained on the basis of the existence and active operation of a parallel concept of ownership of these community developed and managed water systems.

The registration of community water systems

Many organizations operating community self-help water systems are registered under an informal registration system operated by the Ministry in charge of community development. The registration is carried out at the district office of the Ministry, where there is a Community Development Officer. To be registered the community members must choose a name for the project, form a committee of officials - including a Chairman, a Secretary and a Treasurer - and draft a constitution setting out their objectives and the rules that will govern the affairs of the group. Following approval the Community Development Officer will issue a certificate of registration.

The registration of a self-help group by the District Community Officer is relatively easy and inexpensive. It is however a purely administrative exercise as the statutory laws do not provide for it. Registration under this administrative system does not give to the group any legal personality and neither does the group acquire corporate identity under the statutory laws. The group cannot, for instance, own land in its own name under the prevailing land laws of Kenya.

Lack of legal and corporate personality notwithstanding, the majority of community projects operated by such self help groups work quite well. This is so particularly among rural communities in which concepts such as legal personality and corporate identity in terms of statutory law have relatively little relevance. It is

an example of the existence of a parallel normative framework governing the existence and operation of community self-help groups in Kenya, based, in this instance, on a normative framework established purely on the basis of administrative arrangements.

Statutory law, on the other hand provides for various systems for registering organizations, which could be adopted by communities. These can be categorized broadly into membership based organizations and non-membership based organizations.

Membership based organizations are typified by the *society*, also known as the *association*. The Societies Act, Chapter 108 of the Laws of Kenya provides for the registration and control of societies. It defines a society as an association of twelve or more persons. Registration of the association as a society grants the association legal personality under the laws of Kenya.

Unlike self-help groups, societies are registered by the Registrar of Societies who is an officer based in Nairobi. This makes its difficult – and expensive - for the marginalized rural communities to register a society as they would have to travel to Nairobi or engage an agent – often a lawyer - in Nairobi to carry out the registration of their behalf. Strictly speaking a society is unincorporated in law, but this fact is rarely appreciated and rarely does it give rise to any legal issues in the administration of the affairs of the society.

The Cooperative Societies Act, Chapter 490 of the Laws of Kenya, provides for a form of association known as the "cooperative society" which is regulated by the Commissioner of Cooperatives, not the Registrar of Societies. The key difference between this and societies registered under the Societies Act is that the objective of a cooperative society is the promotion of the economic interest of its members. Cooperative societies have therefore not been commonly used for rural community based water projects, but have been used often by farmers organizations in rural areas.

Rural communities have rarely perceived rural community water projects as existing to advance the economic interests of the members. Typically they have perceived such projects as existing largely to advance the social welfare of the members of the community. This is despite the very real link between the availability of water supplies and the economic benefit to the consumers arising from the use of the available water for productive economic activities such as irrigation and livestock rearing. This factor partly explains the difficulty many self help groups experience in enforcing tariff payments for water consumption as there is rarely the will to cut off supplies to community members who fail to make payments.

The failure to make the link between water services provision and economic benefit to particular community members together with the assumption that water services are a social service is further evidence of the existence of pluralistic normative frameworks among poor rural communities. Such communities will face real difficulty in making the transition to the new legal framework which is premised on the belief that water services must be operated "*on a commercial basis and in accordance with sound business principles*."

Non-member based organizations are the second type of organization which could be adopted by communities. The existing types of non-member based organizations used for community water projects are non-governmental organizations (NGOs), trusts and companies limited by shares. It is rare to find a community project registered as either a trust or a company limited by shares, particularly in rural areas. The main form of non-member based organization found implementing community rural water projects tends therefore to be the NGO.

NGOs are set up under the Non-Governmental Organization Registration Act of1990. This provides for the registration of an organization whose objective is the advancement of economic development. It requires three directors, an identified project and a source of funding. NGOs have been favored mostly by persons external to the community who have received funding for a community project and wish to implement the project themselves, rather than through the community members. It is also commonly the case that the NGO will be an urban based organization.

The Water Act 2002 has provided for the provision of water services by water services providers, described as "a company, a non-governmental organization or other person or body providing water services under and in accordance with an agreement with a [water services board]." Under the Interpretation and General

Provisions Act, Chapter 2 of the Laws of Kenya, the word "person" refers to legal or natural person. As the self-help group is not a legal person, it would not qualify to be a water services provider. Consequently, it will be necessary for these community organizations to acquire legal personality by registering themselves as societies if they are to continue providing water services. The considerable advantages of the system provided by the present system for registering self-help groups at district level will therefore be lost under the new regime.

Conclusions and recommendations

This review of the Water Act, 2002 has highlighted significant implications for poor rural communities arising out of the provisions of the Water Act 2002. These must be seen in the context of the existence in Kenya of a pluralistic legal framework which has not been recognized or provided for in the new law. To the extent that the new law is premised exclusively of a formal statutory legal system, it is likely to prove inappropriate to the needs and circumstance of Kenyan rural poor.

The reasons, which have already been adverted to, are that Kenya's rural poor have not been integrated into the private land tenure and other formal regimes upon which the Water Act 2002 is premised. They depend largely on land rights arising from customary practices which however have been systematically undermined over the years by the statutory provisions governing land rights and which are not recognized by the Water Act 2002.

It is unlikely therefore that the new law will be able to facilitate Kenyan's achievement of the Millenium Development Goals with respect to the provision of water and sanitation by 2015 particularly for poor rural communities. This paper argues that, in order to address the circumstances of the rural poor, there is a compelling case for continued reliance, in the management of water resources and in the provision of water services, on alternative and complementary frameworks drawn from community practices.

The paper argues further that there is little benefit to be gained, in the foreseeable future, by attempting to incorporate community self help water systems into formal legal frameworks, through for instance, formalizing ownership arrangements. There is even a risk that disputes will be engendered in the process, as community mechanisms are undermined, as was experienced in the land registration process. Giving community systems due recognition and legitimation calls for the adoption of a pluralistic legal framework. In this respect, the implementation of the transfer provisions of section 113 requires considerable legal innovation.

But it is precisely through such innovative interpretation of the provisions of the new law that the potential of the new law to address the needs and circumstances of the rural poor can be enhanced.

With respect to the management of water resources, one possibility for enhancing the role of local communities in water resources management is to utilize water resources users associations as an institutional mechanism for allocating water resources to a community based entity as opposed to an individual land owner. This recommendation is to the effect that, in appropriate circumstances, a water resources use permit could be allocated to a water resources users association on behalf of all the members of the association. The association would then in turn allocate the water resource to its members according to internally agreed rules. The association would also enforce its rules with respect to the use of the water resource in question.

The above proposal would enhance the role and authority of the water resources users association. It would also utilise community compliance mechanisms as a supplement to the enforcement efforts of the Authority. Its success however would depend on the cultivation of strong and effective water resources users associations. It is recommended that Government support the nurturing of water resources users associations as institutional mechanisms for community management of water resources.

With respect to the provision of water services, the Government should reinforce the capacity and role of district community development officers as a means of providing support to community self-help organizations. Further the rules governing water services providers should take account of the need to forster

and promote community self help schemes, as systems for meeting the water supply needs of the rural poor who are unlikely to receive attention from private operators, or financially hard pressed public systems.

Further down the horizon, the Water Act 2002 will need to be amended to take on board legal pluralism as the basis for the design and operation of water law.

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Intersections of human rights and customs: a livelihood perspective on water laws

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The right to water was adopted as a human right in General Comment 15 by the Committee on Economic, Social and Cultural Rights. It provides a new framework for law and policy supplanting the Dublin Principles which have too often been understood in the African context to mean water with the 'right' price. Does a human rights approach to water, especially in rural contexts, speak to the multiple ways in which men and women share and manage water? We examine if and how local norms and practices include water within a broader right to livelihood. Field research in Zimbabwe demonstrates the existence of a right to water and livelihood which can be responsive to gender and poverty. We suggest the incorporation of local norms and practices within water management laws and policies at regional, national and local levels.

Keywords: human rights, local norms, gender discrimination, livelihood, water, Zimbabwe

Introduction

Water forms part of a broad right to life that underlies rural livelihoods in Zimbabwe. It is expressed in the Romwe Catchment in southern Zimbabwe as water is life (*hupenyu*) (Nemarundwe 2003), in Shamva District as drinking water should be for everyone (Matondi 2001) and in Mhondoro Communal area as one can't deny water to anyone (Derman and Hellum 2002). The newly enunciated human right to water accords well with the practices and norms within most, if not all, of Zimbabwe's communal and resettlement areas. The idea expressed in Zimbabwe that to deny water is to deny life indicates the profounder truth that there can be no human life without water. To deny people water denies them life. The United Nations has determined that the International Covenant on Economic, Social and Cultural Rights (ICESCR) includes a right to water. In its global report on water *Water for People, Water for Life*, (United Nations Educational and Scientific Organization) acknowledges that a right to water had been implicitly recognized in the General Comment on the right to health (2000), in the Convention on the rights of the Child, (CRC 1989), and in the Convention on the Elimination of all forms of Discrimination Against Women (CEDAW 1979). The previous global consensus around the Dublin principles with its emphasis upon water as an economic good seems to be receding in face of a growing movement toward recognizing a human right to water. The Millennium Development Goal aimed at halving the number of people without clean drinking water emphasizes the critical importance of clean water. The World Bank, which had been in the forefront of arguing that water was not a human right but an economic good that required proper financing (*Bridging Troubled Waters* 2002, *Water Resources Sector Strategy*, 2003 et. al.), has shifted toward examining human rights and equity. It would seem that the many elements of the global system are catching up to villagers.

Water reform involves changing how a nation's waters are managed and understood. Zimbabwe's water reforms were conducted principally with the four Dublin principles[1] in mind rather than the human rights frameworks also available. We have found that a common feature of customary norms and practices as observed in a wide range of contemporary studies of natural resource management in Zimbabwe's rural areas and international human rights law is the emphasis on resources that are vital for livelihood, such as food and water. We have identified principles underlying access to water and land and have been surprised at the strength of normative frameworks despite a literature which emphasizes contestation and overlapping spheres of authority. In turn, this has led us to examine if and how these normative local frameworks are consonant with some principles of the right to livelihood and right to water now embodied in a range of international instruments. This paper connects researchers' observations on the practice of a right to water in rural Zimbabwe with how that right could be considered within the broader context of a right to livelihood. We suggest that the conceptual division made between land and water does not fit with local conceptions of livelihoods or the growing evidence of the importance of the land-water interface which includes natural

wetlands and irrigation systems. We have chosen to probe these issues in Zimbabwe due to the processes of water reform and the range of studies investigating water management along with our own research.[2] We have not included in any depth the medium and long-term implications of the current fast-track land reform underway for the right to water and the right to livelihood (Derman and Hellum 2003, Hammar et al. 2003, Hellum and Derman 2004a & b).

This article proceeds as follows: In Part I we detail the emergence of the right to livelihood and the right to water in United Nations, African Union and other international and national documents. We then turn in Part II to a discussion of Zimbabwe's water reform and water management to set the context for the third part. In Part III we examine local norms and practices with respect to rights to livelihood and water. While we note how little the new laws have affected these, we propose greater attention to those elements of local practice which are best conserved. In the conclusions, we examine how human rights with its obligations to protect, respect, and fulfill set new responsibilities for states to accomplish. This is a significant challenge in contemporary Zimbabwe with its divergence from internationally accepted human rights standards.

Part I: Water as a part of the human right to livelihood

When Zimbabwe passed its new water acts the human right to water had not been explicitly recognized, although it had been included in some conventions (see below). In Africa, the right to water had been incorporated into national instruments in the region. For example, the right to water is embedded in the Bill of Rights in Section 27 (1) (b) of the South African Constitution. It states that everyone has the right to have access to sufficient water. Article 12 of the Zambian Constitution maintains that the State shall endeavor to provide clean and safe water. According to the Article 90 of the Ethiopian Constitution every Ethiopian is entitled, within the countries resources, to clean water. The preamble to the Namibian Sixth Draft Water Resources Management Bill of 2001 states that the Government's overall responsibility for and authority over the nation's water resources and their use, including equitable allocation of water to ensure the right of all citizens to sufficient safe water for a healthy and productive life and the redistribution of water. In more general terms, the human right to water derives from the right to life, the right to livelihood and the right to health. It has evolved through piecemeal international, regional and national law-making. It is recognized in Article 24 of The Convention on the Rights of the Child (CRC) explicitly stating that the child has a right to clean drinking water (Article 24). Article 14.2 h of the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) states that rural women have a right to enjoy adequate living conditions, particularly in relation to housing, sanitation, electricity and water supply, transport and communications on an equal basis with men. Article 15 of the Protocol to the African Charter on Human and Peoples Rights on the Rights of Women in Africa on the right to food[3] obliges States Parties to "provide women with access to clean drinking water, sources of domestic fuel, land and the means of producing nutritious food". The human right to water is also recognized in the United Nations Convention on the Law of Non-Navigational Uses of Watercourses.[4] The SADC Protocol on Shared Water Course Systems of 1995 emphasizes equitable utilization of shared water courses applying existing customary international law and community interest taking into account, among other things, the environmental, social and economic needs and the impact of intended uses of the water course (Article 2).

Safe, adequate and available water

A major shift in underlining the significance of a right to water was the General Comment No.15 of July 2002 UN Committee on Economic, Social and Cultural Rights whereby the Committee concluded that there is a human right to water embedded in article 11 in the Convention on Economic, Social and Cultural Rights (CESCR) defining the right to livelihood as Aincluding adequate food, clothing and housing. The term Aincluding, as understood by the Committee, indicates that the catalogue of rights encompassing the right to livelihood is not exhaustive but must be adapted to changing social and economic concerns such as the global water crisis (Eide 2001). Concluding that water is a human right the Committee emphasizes the interdependence between human rights in general and between access to water and the right to health in article 12,1, the right to food in article 11 and the right to life and human dignity enshrined in the International Bill of Human Rights.

Recognizing that water is required for a range of different purposes that are essential for human life, the Committee on Economic, Social and Cultural rights signaled three elements; water must be adequate for

human life, it must be safe and available. It also must be available on a non-discriminatory basis. Adequate water, according to the Committee, is far broader than just clean drinking water since it encompasses water for personal and domestic uses and the necessary water resources to prevent starvation and disease (6). The scope and extent of the human right to water is defined through its link to the right to life, the right to health and the right to food. In the view of the committee and especially important for this paper is that the sustainable access to water resources for agriculture is necessary to realize the right to adequate food (General Recommendation No. 12 (1999). Disadvantaged and marginalized farmers (women and men) would be entitled to special attention to have equitable access to water and water management systems, including sustainable rain harvesting and irrigation technology.

The state obligation to respect, protect and fulfill

The obligation to respect, protect and fulfill rights cuts across urban and rural water supplies and services. The obligation to respect includes a duty to refrain from interfering arbitrarily with customary or traditional arrangements for water allocation, unlawfully polluting water or destroying water services and infrastructure during armed conflicts (G.R. 15, 23 & 24). Taking note of the duty in article 1, paragraph 2, of the Covenant, which provides that people cannot Abe deprived of its means of subsistence, States parties should ensure that there is adequate access to water for subsistence farming and for securing the livelihoods of indigenous peoples. This aspect of the human right to water is also expressed in the Statement of Understanding accompanying the United Nations Convention on the Law of Non-Navigational Uses of Watercourses (A/15/869 of 11 April 1997), which affirms that in determining vital human needs in the event of conflicts over the use of watercourses Aspecial attention is to be paid to providing sufficient water to sustain human life, including both drinking water and water required for production of food in order to prevent starvation.

The obligation to protect requires states parties to prevent individuals, groups, corporations or other agents acting under their authority from interfering with the right to water. States parties are under an obligation to prevent private water service operators from compromising the right to equal, safe and affordable water in terms of regulatory systems including independent monitoring, public participation and penalties for non-compliance (G.R. 15, 23 & 24). Taking the human right to water beyond the nation state the Committee on Social and Economic Human Rights in General Recommendation 15 also recommends that United Nations agencies and other international organizations concerned with water including all United Nations organizations (World Health Organization, etc.) should cooperate effectively with States parties in relations to the implementation of the right to water. The Committee also recommends that the international financial institutions, notably the International Monetary Fund (IMF), the World Bank, the African Development Bank, etc. should take into account the rights to water in their lending policies, credit agreements, structural adjustment programs and other development projects. The emerging literature on the human right to water by the World Bank and the World Health Organization (WHO) suggest a paradigmatic change (WHO 2003, Salman 2004).

As regards the duty to fulfill States parties must, to ensure that water is affordable, adopt measures including: a) use of a range of appropriate low-cost techniques and technologies; b) appropriate pricing policies such as free or low-cost water; and c) income supplements. Any payment for water services has to be based on the principles of equity, ensuring that these services, whether privately or publicly provided, are affordable for all, including socially disadvantaged groups. Equity demands that poorer households should not be disproportionately burdened with water expenses compared to richer households (G.R. 15, 26 & 27). This has implications for the implementation of the user pay principle which has become ubiquitous in urban and rural settings.

Non-discrimination

States parties are also obliged to ensure that the right to water is enjoyed without discrimination on the grounds of sex, class, color religion or political opinion. States parties are to ensure that new laws, policies and programs do not deny this right either *de jure* or *de facto* to selective portions of the population. Inappropriate resource allocation can lead to indirect discrimination. Investment should, according to Comment 15, not disproportionately favor expensive water supply services and facilities that are only available to a small percentage of the population. CEDAW and Protocol to the African Charter on Human and Peoples Rights on the Rights of Women[5] in Africa substantiates the principle of non-discrimination in relation to water, land and food security. Simply having gender neutral laws in a situation where resources (time, money, land, water, for example) are unevenly distributed between men and women, the CEDAW and

the Protocol oblige States parties to take measures to eliminate both direct and indirect discrimination.[6] Indirect discrimination means any distinction, exclusion or restriction made on the basis of sex which has the effect that they impair or nullify, on a basis of equality between men and women, human rights in the political, economic, social, cultural, civil or any other field (CEDAW Article 1).' The concept of indirect discrimination encompasses development policies and programs that on their face value are gender-neutral but in practice are biased against large groups of female users in comparison with male water users (Hellum 2005). Policies, programs and plans for improvements and investments in water, that are based on a division between domestic and productive water use, will often have a discriminatory effect. Female small farmer's water uses, for example to irrigate vegetable gardens from shallow wells on *dambos* or boreholes, have been seen as unproductive by conventional economic standards. Seemingly gender neutral investment policies targeted towards productive water uses have, as a result, often disproportionately favored expensive water supply services controlled by men. In accordance with Article 26 of the Protocol to the African Charter on the Rights of Women in Africa states parties are obliged to undertake to Aadopt all necessary measures and in particular shall provide budgetary and all other resources for the full and effective implementation of the rights.

Part II: Zimbabwe's water laws and water management system

The core of Zimbabwe's water reform rested on increasing access to water while ensuring the productive use of water.[7] New participatory structures were created to increase access to water management decision-making. These are called Catchment and Catchment Councils which are based in Zimbabwe's seven hydrological zones. In addition, a new parastatal was established – ZINWA - to shift water management expenses from government to users and to increase the productive use of Zimbabwe's waters. In Zimbabwe, prior to the Water Act of 1998, large-scale commercial farmers controlled Zimbabwes waters through a water rights system - first in time, first in line. This often made it difficult for new appropriations to be made to black small-scale farmers who had great difficulty in finding the resources to obtain water rights and to negotiate the bureaucracy to secure those rights.

Under the Act all water is vested in the President and no person can claim private ownership of any water. In presenting the first reading of the new draft Water Bill, Attorney General (now Minister of Justice) Patrick Chinamasa emphasized that:

> What the existing legislation has done is that the water is the President's water but the President then put in legislation to give permission to people to exploit it and that is what is peculiarly known as the water right. (Zimbabwe Parliamentary Debates 1998, p. 1566)

In defending the abolition of the concept of private water Chinamasa also asserted the common Zimbabwean understanding of water:

> Water is a public resource. It is a gift from God. None of us here are rain-makers, and that includes commercial farmers. The rainmaker is God. He provides His people and that water forms part of the hydrological cycle. (Zimbabwe Parliamentary Debates, p. 1562-63)

This is consistent with Zimbabwe's history as a centralized state while appearing to incorporate new water-management global policies (Derman, Ferguson and Gonese 2001). The 1998 water legislation transferred most national planning functions from the Department of Water Development to the new parastatal ZINWA with oversight from the Ministry of Water Development and Rural Resources. ZINWA is funded through the sale of water behind government dams, the provision of water to cities and the levying of water charges to large-scale users. Management of Zimbabwes waters are to be shared with the new stakeholder organizations of Catchment Councils and Subcatchment Councils. [8]

Zimbabwe's waters are divided into two categories - commercial water and primary water. Historically primary water was an introduced concept stemming from a residual, non-reflective category in the earliest Southern African water laws. The first regulation of water was by the Order in Council, 1898, Section 81 pertaining to the British South Africa Company. It required the company to ensure that the natives or tribes had a fair and equitable portion of springs or permanent water. In 1927 the positive requirement of fair and equitable is changed to any decision that substantially effects the requirements for primary use of water by Tribal Trust Land (TTL) residents be approved by the Board of Trustees for Tribal Trust Land (Hoffman

1964). However, participation by 'tribal' and later communal area residents in water decision-making was nil.

Primary water is defined in the Water Act of 1998 as water used for: 1) domestic human needs in or about the area of residential premises, 2) animal life, 3) making of bricks for private use and 4) dip tanks.[9] In sum, it is not restricted to drinking water but seen as an integrated part of livelihood necessities such as food and housing in the communal areas. The state is obliged to respect and protect the right to primary water as embedded in the Act. What is meant by "domestic human needs in and about the area of residential premises" is, however, not clear. New innovative forms of commercial cropping emerging within the common property regimes in the communal lands, such as gardening for consumption and sale, represent a challenge in how Catchment Councils when issuing water permits draw a dividing line between commercial and primary water uses. These uses render problematic the division between commercial and primary water. Under the new Water Act of 1998, it is only water used for commercial purposes that requires a permit in terms of Section 34. Commercial waters definition depends upon use - water used for purposes including agriculture, mining, livestock, hydroelectric power, etc. It follows from the ZINWA Act Section 41 that only permitted water is subject to the user pay principle in terms of the new water levy.[10] Thus rural primary water users do not have to do so.

One Catchment Council, The Mazowe, debated what constitutes the difference between commercial and primary water use. The Council Chairman suggested a technological answer: if the water is moved by hand it is primary water, if it is moved by machine then it will be considered commercial. The Catchment Manager from ZINWA present at the meeting indicated that as of yet, ZINWA had not decided what the guidelines should be in deciding whether water use was primary or commercial.[11] This view was contested by villagers from Bangira in Mhondoro Communal Lands who argued that they would refuse to pay for water moved by a pump to provide their vegetable gardens with water. A couple who had worked hard to establish funding for the dam so as to raise the living standard of their own and other families argued that since the surplus from the gardens was used for livelihood essentials, such as clothes, school-fees or medicine, the water use should not be seen as commercial.

This lack of conceptual and policy clarity applies to the thousands of boreholes currently used in Zimbabwe. ZINWA's policy was to charge borehole owners for water because borehole water is no different than stream or river water. It also, like all water, belongs to the Government. On the other hand, the Presidential Land Review Committee under the Chairmanship of Dr. Charles Utete recommended that levying water from boreholes should be stopped because "it discourages investment in water resource development and the enhancement of production on farms through irrigation (Vol. I 2003: 177). In a special study on water resources and irrigation development in the post fast track land reform era commissioned by the Utete Committee primary water uses are defined as mainly for domestic use such as drinking, cooking and washing and small-scale garden irrigation is not included (Manzungu Vol. II: 59).

These different conceptualizations do not sit well with CESCRS's definition of water as a part of the right to livelihood in General Recommendation 15. This recommendation emphasizes that the sustainable access to water resources for agriculture is necessary to realize the right to adequate food. Local management systems as described earlier cut across the commercial/primary division. In our view, human rights based approach calls for a clearer definition of primary water uses that transcends clean drinking water and includes the legitimate concerns of poor small scale farmers.

While such legal clarifications may be undertaken by the stroke of the pen, the CESCR also obliges states to take positive steps to fulfill the human right to water. Such positive steps call for long-term economic commitments implying that internal and external economic resources are invested in infrastructure that are beneficial for the poor in all of Zimbabwe's rural areas, not just the newly resettled ones.[12] Despite the emphasis upon equality of access in the initial phases of water reform, most attention has been devoted to increasing the number of commercial water users. Zimbabwe's new water management system was based on the premise that fees for commercial water use would be used for the development of water resources. The areas under irrigation in Zimbabwe have diminished greatly since the irrigation systems on the former commercial farms have not been sustained and older government sponsored irrigation schemes have been unable to continue in light of the harsh macroeconomic climate following the fast track land reform. According to Manzungu the total number of hectares under irrigation has fallen from 186,600 hectares to

120,410 hectares. This loss of 66,000 irrigated hectares has primarily been in the formerly large scale commercial farm sector (Manzungu Vol. II: 89).

The institutional separation of water supply from water resource management issues in the communal lands is another factor that has inhibited water development. Under the new water policy the Integrated Rural Water Supply and Sanitation Program remains separate from the above while continuing to be tasked with the supply of providing safe, protected drinking-water supplies for all rural water users and to ensure that every household had at least an improved, partially enclosed latrine. This tended to alienate primary water users who are the vast majority of Zimbabwe's water users (Manzungu 2004: 13). Water supply programs have been especially vulnerable to government service shrinkage and donor withdrawal. It is poorer women who rely heavily on water sources that are free of charge, such as borehole water for their gardens; find themselves caught in the gaps and mismatches between these different policies and institutional structures. Their water needs fall outside the scope of both the water and sanitation program and the water reform policy aimed at larger scale users.

There has been a dramatic increase in the numbers of Zimbabwe's poor. Zimbabwe has one of the highest rates of inflation in the world combined with a shrinking economy - shrinking in the sense of a series of macroeconomic measures including gross domestic product, economic growth, formal sector employment, etc. Indeed its index has fallen from a high in 1985 (UNDP p. 243) to 90th of 94 developing countries, almost the very bottom. In the past several years Zimbabwe has fallen from a medium human development nation to a low one (Human Development Report 2003). It was ranked 145th in the world in its human development index and it is this high only because of high rates of schooling. Due to Aids it is projected to have only a .2% annual growth rate - from 12.8 million people in 2001 to 13 million in 2015. 1/3 of the population is reported to be sick with Aids or HIV positive. (P. 260). Life expectancy at birth has fallen from 56 to 33.1. The indicator of inequality, the Gini Index is growing.[13] In this context there needs to be a much greater coordination between water policies and poverty alleviation strategies.

Under the present circumstances laws, policies and practices that prioritize the needs of the poor have great urgency. The current emphasis upon commercial water may be appropriate for many users but not for the growing number of communal and resettlement farms engaged in small-scale irrigation.

Part III: Local practices and norms

The new Zimbabwean water policy maintains a single uniform water management system. It overlooks that access to water is, like most other natural resources, regulated by international, national and customary norms. The regulations framing the new water management system are molded on a large scale commercial farming model without giving much thought to the needs of the traditional as well as the new and innovative forms of cropping that gradually are emerging within the common property regimes in the communal lands. In communal areas and resettlement schemes both men's and women's access to water still relies heavily on customary use rights (Pinstrup-Andersen 2000:13). These customary use rights have in part been protected as described above by the concept of primary water. In this section of the paper we explore if there might be an explicit or implicit recognition of a right to livelihood at least with respect to access to water for livelihood purposes in Zimbabwe's rural areas.

Towards this end, we have since 1999 been studying water management in three villages of Bangira, Murombedzi and Kaondera in the chieftainship of Mashamayombe in Mhondoro Communal Land (Derman and Hellum 2002, Hellum and Derman 2004a).[14] This local qualitative study was part of a wider study of national water reform in Zimbabwe that has been undertaken by the Center for Applied Social Studies (CASS) at the University of Zimbabwe. We chose this area due to a rapid and recent increase in tobacco growing, a relatively high number of private wells and the existence of a dam project. Apart from dry season vegetable gardens located along streams, rivers, seasonally flooded grasslands (*vleis*) and boreholes, agriculture in this area remains primarily rain fed maize and cotton with an expansion of irrigated tobacco. Because of these trends in commercialization, we expected to find decreasing open access to the area's water resources. We made the assumption that because the deep and open wells were located on homesteads and that there was a great increase in tobacco production that these wells would become increasingly "private".

The right to safe drinking water

Our study in Mhondoro suggested that at the local level, as in human rights law, there is a right to clean drinking water. Villagers demonstrated a surprising degree of consistency over time and space in upholding the norm that no one can be denied clean drinking water (Derman and Hellum 2002). The obligation to share drinking water extended to wells which were privately dug and on basically private land. In one village, a private borehole paid for by one household, rapidly became a village source of drinking water. In another village a borehole built by the Zimbabwe Tobacco Association for irrigating tobacco seedlings became an important water drinking source for the entire village. In a third village in the study area, the private well of a widow served as a source of drinking water for almost the entire village. Based on the norm and practice of sharing, access to drinking water extends to boreholes constructed for principally commercial, dedicated or private use. The duty to share increased rather than decreased during drought periods. Such sharing cut across kinship and village borders. It has been upheld during the accelerating economic and political crisis. Water users and well-owners reported that they had never paid or received money or give gifts. To breach the norm of providing drinking water meant risking sanctions or being the target of witchcraft.[15] Universal access to drinking water in Mhondoro points to a morally based duty rather than a negotiable and reciprocity based notion of property often pointed to as a characteristic feature of African customary laws (Berry 1993).[16] Applicable to men and women, insiders and outsiders, it also points to a notion of equality and non-discrimination.

These finding are consistent with our readings of a series of Zimbabwean monographs on natural resource management including water, wetlands, forests and land (Matondi 2001, Sithole 1999, Derman 1998, Nemarundwe 2003, Walker n.d. and Cleaver 1998). The empirical record from communal areas in Shamva, Mutoko, Chiduku, Dande, Masvingo, Guruve, and Matabeleland all suggest that water for drinking can and should be made available for all. Nemarundwe in her doctoral thesis reports from the Romwe catchment in Chivi District, South Zimbabwe, that drinking water is made available to all no matter what the source of water. Available water sources include boreholes, riverbed wells, rivers, wells, collector wells and dams. No matter the tenurial status, whether publicly or privately owned the water sources are available for drinking water. In a powerful and clear manner she writes: ABecause water is considered *hupenyu* (life), there has been no case of denying another village access to water during drought, although rules of use are enforced more stringently during drought periods (2003: 108). The study points to actual incidents where this general ideal was challenged. One example is a well owner who prevented others from accessing his well. Two days after he locked the gate to the well he found a dead dog. In response to this the well owner later unlocked the gate (2003:113) In a similar vein Prosper Matondi who carried out his research in an area of resettlement farmers and two irrigation schemes in Shamva District near Bindura, the Provincial Capital of Central Mashonaland Province, found that drinking water remained available for all despite growing scarcity of both land and water resources. In parallel fashion, Bevlyne Sitholes research in Mutoko and Chiduku communal areas in Eastern Mashonaland Manicaland summarizes farmers' views on water as follows: Awater should be available to all, rich or poor, but the person who impounds the water is the one who makes the river dry (Sithole 1999: 195). Frances Cleavers study in Nkayi communal land in Matabeleland suggests that water user rules that limit poor peoples access to water are invalid. She observed that poor women got away with breaking the rules that limited water resource to certain individual users (1998: 357).

Water for gardens

Almost every family in the three villages in Mhondoro had gardens when we began our study in 1999. A quantitative survey of water management in the area demonstrated that ninety per cent of households had some form of dry season garden requiring hand irrigation[17]. The family gardens were usually the main responsibility of the women. The crops in the gardens are kovo, rape, onions, tomatoes, beans, ground nuts, maize, sugar cane and cabbage. There are also fruit trees including bananas, papayas (pawpaw), and mangos. They rely heavily on the common pool water resources including rivers, boreholes, deep wells and shallow wells. Gardens are often situated on land that is either seasonally flooded or holds water from the rainy season long into the dry season. The gardens are as much a source of income as of food for the family. The income is often used for meeting household needs including food, education, clothing and medical needs. As in Eastern Mashonaland and Manicaland, gardens are fairly recent. A number of elderly people, such as the headman in Kaondera and his wife and the grandmother of our local research assistant, told us that they were the first villagers to start gardening in the 1950s. They were taught to grow vegetables by an agricultural extension officer in the colonial administration, at that time termed CONEX. People expanded their gardens after independence in 1980 as a response to the continuous rise in food prices. Gardening was also facilitated

by a government scheme that set out to increase and improve water supplies through inputs like free cement for wells. The Zimbabwean government began withdrawing from rural areas during the 1990s under the combined policies of structural adjustment and decentralization. People in Mhondoro, as local communities elsewhere, have since been left to find alternative economic sources for expanding water supply for drinking water, watering cattle and irrigation. The CASS survey indicated that 70 per cent of the households in the three villages had invested work and money in water including private wells and other water resources.

Our study from Mhondoro suggests that the right to water as part and parcel of rural livelihoods extends beyond the right to clean drinking water (Hellum 2005). Households who needed garden land were allocated appropriate land.[18] They were mainly irrigated by women and children by means of common pool resources from nearby rivers or shallow wells on wetlands. Crops grown in these gardens generated income that paid for children's education, food, clothing and farm equipment and provides vegetables for household consumption and nutrition. In recent years of drought and economic hardship the produce from women's gardens are essential source of livelihood. In one of the villages everyone we interviewed stated they had obtained the headmans explicit or implicit approval to access land for gardens on *vleis* or close to rivers. The gardens, the Sabhuku said, were important sources of livelihood and self reliance. For this reason he had not taken action when people allocated themselves gardens without his permission. Another reason was fear of revenge in terms of bad spirits, *Angozi*. This suggest the existence of an underlying norm of sharing. A similar pattern was observed in another village where peoples gardens were moved from the wetlands to communal gardens close to a newly constructed dam. Everyone was granted land for gardens in this area. If the land allocated for the communal gardens was insufficient the headman saw it as his duty to allocate more land. None of the villagers we talked to had paid for the land. This suggests a wider right to livelihood that not is limited to clean drinking water but extends to access to garden land with available water sources. While the case of access to gardens with available water resonates a deep concern for livelihood it is, unlike the right to safe drinking water, not available on a universal and non-discriminatory basis. Outsiders do not have access and the land is, in principle, allocated to the male head of household on behalf of the family.

The right to water for gardens appears to be subject to greater contestation than a right to drinking water. Local communities will act to sanction breaches of these norms. For example, Nemarundwe, provides a short illustrative case of water conflict at a small dam between richer and poorer, women and men, livestock owners and non livestock owners (Nemarundwe 2003). During a drought year the dam committee chairman sought to stop villagers from planting gardens until it was clear that there was enough water for livestock. Garden project members protested indicating that such a move would disadvantage poor farmers who after all did not own livestock and depended on the irrigated plots for their livelihoods (2003: 166). The dam chairman proceeded to seal off (with the assistance of two other villagers) all outlet valves at the dam so that no water could flow to the garden. As a result he was challenged publicly by villagers. The dam chairman then let out all the water, until it was below the outlets. The dispute's resolution required external authorities to help sort out the conflict. The dam chairman was subject to a tribunal organized by the RDC and the NGO supporting the project. He was reprimanded and the villagers called for him to resign from the dam committee. However, he apologized to the project members and promised to cooperate with other farmers in conserving water resources.

Unlike sources of drinking water shallow wells for irrigation of gardens may be fenced off to protect the crops. Prosper Matondis study from Shamva focused on the growing scarcity of arable land near water (Matondi 2001). As is the case throughout Zimbabwe, *dambo* gardens are located near the streams dissecting the *vleis* that also are used as grazing areas. However, over time they are used more for gardens than grazing. With the presence of livestock, gardens have to be fenced to prevent that animals eat the produce and drink from the well. The fencing of vegetable gardens along rivers or on wetland is common practice all over Zimbabwe. This suggests that land once is allocated for gardening, the land and the water available for irrigation becomes family property. Access to both land and water may as such be restricted on the basis of kin.

Dr. Bevlyne Sithole has produced the most detailed social science work on *dambos* in Zimbabwe (Sithole 1999). Her research was carried out in Mutoko (Mashonaland East Province) and Chiduku (Manicaland Province) communal areas. As in other *dambo* areas, these are locations for multiple uses including fruit trees, fish ponds, grazing areas, brick making, woodlots, sacred areas, and reed areas. Sithole documents increased desiccation of *dambo* areas and thus increased difficulties in using the *dambos* particularly in using

water for small-scale irrigation. According to Sithole (and also Matondi 2001) the main mechanism for sharing scarce livelihood resources under these conditions is subdivisions among kin within the household.

While the right to drinking water is afforded to everyone regardless of village belonging, kinship and marital status access to land with available water for gardening is as a main rule allocated to the male head of household on behalf of the family. Yet livelihood concerns crosscut the male status rule so as to make land available to single and childless women, widows and divorcees. While married women, due to these formalities, have been seen as landless Dr. Sithole, observed that women seem to be acknowledged by most men as owners of the garden(1999, p. 80).[19] This strongly suggests that ownership within the family is not acquired through rules concerning family representation but by actual use and work on the land.

While accepted within and amongst local communities these norms are frequently overlooked and disregarded in development policies, projects and practices. In one of the largest resettlement projects in a communal area in the Zambezi Valley, Derman (1997) reports that women farmers could no longer maintain their dambo gardens since they were moved away from streams and rivers. Boreholes were provided for drinking water and watering livestock. There was no broader concern for livelihood as people were left to dig their own well gardens for vegetables. Some women continued walking long distances to keep up their gardens while other families invested in private wells. For many women the only solution was to use the scarce borehole water for irrigating vegetables. Because of the very dry conditions and livestock water requirements there are great pressures upon borehole which has meant that many women have had to give up or reduce their gardens.

The right to livelihood

As we have seen rural people in Zimbabwe see land and water as closely interconnected in fulfillment of livelihood needs. But livelihoods are no longer just about access and use of land and water in rural areas.[20] Access to basic livelihood resources such as health, food and housing also depend on cash. Like many rural southern African residents, Zimbabweans, are dependent upon remittances from kin in cities or abroad, or reliant upon their own engagement with paid jobs or market activities. Households and families are quite different and even in a one rural area there are significant differences between them in terms of reliance upon land and water. Yet, within the context of this mixed rural livelihood structure, *dambo* or wetlands cultivation has particular significance since they have grown in importance due to the unpredictability of Zimbabwe's rains, increased reliance upon cash crops and the possibilities of hand irrigation. *Dambo* garden cultivation is a recent phenomenon. For example, Sithole documents that *dambo* cultivation in Mutoko and Chiduku in Eastern Mashonaland and Manicaland stems from the establishment of mission schools and hospitals in the mid-twentieth century (1999: 140). In general, as found by Derman and Hellum, the major garden crops come first from large-scale commercial farms and then from agricultural extension during and after the colonial period. The mixed character of these uses and principles that are neither traditional nor modern show how rural people in their livelihood strategies draw on a wide variety of sources.

Both clean drinking water and access to land with available water is shared between and within village households on a day to day basis. The norm of sharing underlie trouble-less cases in terms of everyday life practice but it is also confirmed by ideal statements from villagers (what people say) and more importantly trouble cases both from our own, Nemarundwes and Sitholes research. A number of incidents where people who had refused to share their drinking water were subject to revenge in terms of poisoning or death of animals points to the existence of spiritually sanctioned norms. Access to garden land remains relatively open compared to rain fed fields. Like water, denial of land for gardens was believed to bring with it supernatural sanctions. Villagers also took action through local dispute resolution agencies when someone broke the rules concerning water sharing both in relation to drinking water and water for gardens.

Our reading of Matondi, Nemarundwe, and Sithole, who all focus on communal area water management, suggest that in situations of scarcity of common pool resources the norm of sharing is placed on the kin. This perspective seems highly appropriate and relevant since this scarcity has been created by the unequal divisions between land and water in the commercial farm sector and the communal and resettlement areas. The pattern was that rather than deny some families or households access to *dambo* land, the gardens were subdivided into smaller areas.

All in all these practices from different parts of Zimbabwe point towards the existence of a set of interrelated norms of sharing of land and water that are essential for livelihood. The widespread acceptance of these norms appears to be vital in local communities' ways of handling poverty and food security. These local norms and practices are resonated in the emerging human rights law seeing water as part of the right to livelihood in a broad sense encompassing both clean drinking water and adequate access to water for subsistence farming and for securing livelihoods.

These findings from Zimbabwe are not necessarily matched by the situation in other Southern African countries. Research on irrigation schemes, wetland and stream-bank gardens in Malawi by Anne Ferguson, Diamon Kambewa and Pauline Peters in the Likangala Basin point in a different direction. As throughout Africa, these wetland fields and gardens have become increasingly important because they are more water secure than upland fields and they can be sites for formal irrigation schemes. A key distinction made by the Malawi research team is between stream-bank gardens and wetlands cultivation.[21] Stream-bank gardens tend to reside within the sub-lineages and clans of chiefly families. Peters contends that these should be viewed as family property rather than customary land (2004: 15). Due to the lands scarcity, rental of stream-bank land has been growing along with the level of rents. There is little or no stream-bank land left to allocate. Wetlands appear to have become valuable for cultivation much later than stream-bank gardens. They belong to villages and chiefdoms and thus access to them has been at the request of customary authorities. There has been a shift from symbolic gift-giving to obligatory annual payments that resemble rents. (Peters 2004: 15). The Malawi team argues that the new land and water policy documents for Malawi do not take into consideration stream-bank and wetlands gardens which are essential for rural livelihoods. This has also been the case in Zimbabwe.

Part IV: Conclusions and reflections

In principle, the human right to water and the right to livelihood embedded in international and regional African instruments protect the poor, women, children and families by setting standards that are binding for international, national and local policy, law and decision makers. To take these abstract principles down to people's realities on the ground tensions and gaps between international, regional, national and local norms and practices will have to be explored in different political, social and economic contexts. We suggest that such an emphasis could be used for an active research program to examine if and how research findings from Zimbabwe can be expanded to other regions and nations within SADC.

Primary water can be a starting point for national legislation and policies to include a right to water and a right to livelihood. The idea of a right to primary water for basic human needs including domestic, animal and house building functions is unique in the region. It has meant that such waters so far have been protected from the growing demand for 'user pay' which, according to the Water Act, is restricted to commercial water. However, the pressures upon a more privatized water sector, led by the Zimbabwe National Water Authority, to be self-financing in the context of a national economic crisis demonstrates the need for greater legal and political clarity for primary water. Priority should be increased on how to use primary water for socially beneficial and development purposes other than simply expanding commercial water use. Primary water enables the concept to be developed in the light of local concerns and the wider regional and international human rights laws.

Local discourses and practices of distribution and management of water speak to the emerging notion of water as a human right. Despite the recent origins of *dambo* cultivation and gardens, they have been utilized under a principle of a right of access to both land and water for livelihood purposes. The concept of livelihood, as locally understood, has responded to a changing social and economic environment by including sale of produce but with the understanding that it is for socially understood purposes including education of children, health expenses, clothing, house repair etc. along with the consumption of garden products. It cuts across a narrow distinction between commercial and primary water. From a local livelihoods' perspective, it makes little sense to make a distinction between garden products that are directly consumed by the family and products that are sold to provide for medicine, food or clothes. Once again rural peoples' decision making seems highly responsive and sensible in light of changing survival requirements and should guide laws and policies.

Neither the Zimbabwean land reform nor the water reform addresses how to assist those engaged in small-scale irrigation. The priority has been given to commercial waters and to redeveloping irrigation systems in what had been the large-scale commercial farming sector. In Zimbabwe, most communal area irrigation is outside of formal irrigation schemes. Neither the Zimbabwe water acts nor recent policy documents make any mention of how to support informal irrigation carried out in Zimbabwe's communal areas and increasingly in the former commercial farm lands. This has to do with the division between the development functions for communal and resettlement areas tasked to Rural District Councils and central government, water management functions given to Catchment Councils, ZINWA and the Ministry of Water Development and the rural water supply functions which are separate from the new institutions of water reform.

The current multi-level and multi-layered political and economic crisis in Zimbabwe poses challenges to using human rights as a framework for reform. Because international human rights are considered to be incompatible with the current Africanist directions of the Zimbabwean government neither the Covenant on Economic, Social and Cultural Rights, the Convention on the Rights of the Child nor the Protocol to the African Charter on the Rights of Women (among others) have been deemed irrelevant to the government's policies. Our research suggests that this dichotomous perception of African culture and human rights is false in so far as the rights to water and livelihood are concerned. It shows that prevailing norms and practices in communal areas and the emerging human right to water and livelihood provide common ground for a new framework facilitating active and direct support to small-scale (and often poor) farmers.

Some selected research and policy suggestions:

- Local water management strategies and principles be researched to see how they can be used to reformulate policy designed to reduce poverty in the region.
- In the longer term we suggest that water management incorporate the right to water and livelihood implied in 'primary water', embedded in local practice and the human right to water.
- Communal tenure rights be recognized for wetlands and small scale irrigation where appropriate and desired by farmers. Women in poor families rely heavily on common pool resources in terms of land and water for their gardens. Given the complexity but also tenuousness of women's access to land we suggest that a model of one size fits all ('formalization' or registration) may work to disadvantage women even further. We look forward to seeing several models with guiding principles drawn from the right to livelihood, right to water and the Protocol to the African Charter on the Rights of Women and CEDAW to be made available for communities to select ones most appropriate for them.
- Laws and policies must undergo a gender impact analysis in order to identify potential discriminatory effects. One problem is that water sources used by female small farmers, for example irrigation of vegetable gardens by borehole water, by conventional economic standards have been seen as unproductive. As a result of the gendered character of land and water uses, seemingly gender neutral investment policies have often disproportionately favored expensive water supply services controlled by men. This may lead to indirect discrimination in terms of both CEDAW and the Protocol of the Rights of Women to the African Charter.

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Notes

1. The four Dublin Principles are: (1) Freshwater is a finite and vulnerable resource, essential to sustain life; (2) water is an economic and social good; (3) Water development and management should be based on a participatory approach involving users, planners and policy-makers at all levels; and (4) Women play a central part in the provision, management and safeguarding of water. The thinking behind these principles has been incorporated into policy documents authored by the World Bank and other donor organizations (World Bank 1993, 2002, 2003).

2. Water reform has been part of the general process of decentralization. The argument runs that Aif natural resources are managed at the local level, then they will be looked after better and more efficiently, resulting in improved opportunities for sustainable livelihoods (SLSA Team 2003a: 3). There was, however, no discussion of the local practices and norms which can influence or even determine whether decentralization will be successful.

3. The Protocol was adopted by the 2nd Ordinary Assembly of the African Union, Maputo, 11.July 2003

4. The statement of understanding states that in determining vital human needs in the event of conflicts over the use of water courses Aspecial attention is to be paid to providing sufficient water to sustain human life, including both drinking water and water required for production of food in order to prevent starvation

5.The introduction to the Protocol states that Articles 60 and 61 of the African Charter on Human and Peoples Rights recognize regional and international human rights instruments and African practices consistent with international norms on human and people's rights as being important reference points for the application and interpretation of the African Charter.

6. This obligation is embedded in Article 1 of the CEDAW and in Article 2 in the Protocol to the African Charter on the Rights of Women

7. There is a substantial literature on different dimensions of Zimbabwe's water policies and water reform including Dube and Swatuk 2002, Derman, Ferguson and Gonese 2001, Mtisi and Nicol 2003, Hellum and Derman 2003, Derman and Gonese 2003, Manzungu, Bolding and Zawe 2004, among others.
8. These are the Sanyati, Manyame, Mazowe, Save, Runde, Mzingwane, and Gwayi.
9. Water Act 1998 section 32(1)
10. In accordance with Section 41 in the ZINWA Act The Minister may, in consultation with the approval of the Minister responsible for finance, by statutory instrument, impose a water levy on any person holding a permit issued in terms of the Water Act (Chapter 20:24).
11. Research Notes, February 2000. At a Mazowe Catchment Council meeting there was a discussion whether to ask the Centre for Applied Social Sciences to suggest a definition for commercial water. This discussion ended when the Council's Chair suggested the technological definition.
12. There has been a large decline in support to communal areas due to the emphasis upon land acquired during the Fast Track Land Resettlement Programme.
13. Schreiner and van Koppen were disturbed at the high Gini Index for South Africa in 2002 - 59. Zimbabwe's was 56.8 in 1995 which was in part due to large-scale commercial farmers. However, there is much evidence to indicate its growth in the past several years although much statistical gathering has been halted.
14. Mhondoro Communal Land is situated in Chegutu District, which is made up of commercial farm, small-scale commercial, communal, resettlement and urban areas 120 kilometers west of Harare. The major river that flows through this high plateau area is known as the Mupfure. It is part of the larger Sanyati River Catchment south east of Harare and flows through communal and commercial land including the city of Chegutu.
15. The norms of sharing and potential sanctions exist in those areas of the three catchments where the CASS water research team has been working.
16. There is an intense debate on the degree and extent to which access to land can be obtained through kin ties and networks and the extent to which it is being concentrated and access controlled by an emergent property class (Berry 2003, Peters 2004). Increasing land concentration and control will have significant consequences for access to water.
17. CASS BASIS survey data, CASS 2000-2001.
18. Informal irrigation land constitutes the vast majority of irrigated lands in Zimbabwe's communal areas. Yet the Irrigation Strategy of 1994 which was carried out in preparation for water reform focused only on government sponsored formal irrigation schemes covering only 2,000 hectares at that time (GoZ, 1994).
19. This is not straightforward. Sithole writes AIt seemed impossible for women and men for that matter to think about ownership in terms of this belong to this one or that one (1999: 80).
20. The process of decreasing dependence upon agriculture alone has been called by Deborah Bryceson (1999) de-agrarianisation.
21. Derman found in the Zambezi Valley that stream-bank fields, in contrast to dry season gardens, were in the hands of relatively few chiefly families (1997). The key distinction was between rainy season fields and dry season gardens.

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Shona customary practices in the context of water sector reforms in Zimbabwe

Claudious Chikozho and Jim Latham

Zimbabwe has implemented a water sector reform programme aimed at decentralizing water resources management to the user level. The Water Act of 1998 led to the establishment of new management institutions. Although the act does not make any reference to customary law, traditional informal practices still prevail among rural communities. Case studies illustrate that the new water legislation lacks relevance for rural communities, who rely on their indigenous institutions for the management of natural resources. These customary practices are well understood by the people, they have congruence with their worldviews and are functional. There is a conspicuous absence of true devolution of authority in the new statutory arrangements. This means that at grass roots level, the only consistent and observable form of management is that found in local customary institutions. The paper argues that despite the influence of colonial and post-colonial regimes, traditional institutions remain relevant to local communities.

Keywords: Zimbabwe, devolution, water resources management, customary law

Introduction

The Government of Zimbabwe embarked on a reform of the water sector in 1995. Informing this decision was a belief that the Water Act of 1976 (in turn a revision of the original Water Act of 1927) was inadequate in a number of areas. The Government of Zimbabwe indicated the principles that it hoped would be enshrined in a new Water Act (finally passed in 1998 and promulgated in 1999) in order for it to be an effective instrument for the reform of the management of the country's water resources. These were:

- all surface and underground water will belong to the State
- all Zimbabweans must have access to water for primary use
- all water must be beneficially used
- water should be treated as an economic good
- water tariffs will need to take cognizance of those unable to pay the full price
- water rights in perpetuity need to be replaced by water permits issued for a specific time period.
- water management should involve all stakeholders at the lowest possible level and
- the environment is to be considered as a consumer in its own right (see Latham, 2002).

The act established catchment councils comprising of members from sub-catchment councils (selected on a stakeholder basis) which in turn are underpinned by informal, non-statutory water user boards. There is no provision for customary law and practice in the act, apart (possibly) from recognition of primary rights[1] to water. However, water use and management is still strongly influenced by customary law, and informal practices. The dilemma created by the new legislation is how to reconcile the newly created institutions with existing formal and informal institutions. They have to reconcile statutory district local government (Rural district councils - RDCs) and traditional (indigenous) institutions of governance on the one hand, with the catchment councils (CCs) on the other. There are immense problems in achieving any sort of fit between the spatial dimensions of the resource and the institutions of resource governance and rural development (Latham 2002). Little attention has been paid to the role of customary law and other locally developed legal or normative systems (Katerere and Zaag, 2003). The application of both indigenous and formal institutions of governance as instruments for the management of resources, and how a useful symbiosis can be achieved is an exciting challenge to academics and water professionals. The Zimbabwean case is made more complex by the current "fast-track land reform programme".

This programme has had a serious impact on both the customary laws and the new water management regime in the sense that it has generally ignored the rule of law – both formal and customary. Its "fast track" nature seriously disturbed the smooth implementation of the water reform programme. Most noticeable has been the uncontrolled use of water particularly in the resettlement areas, difficulties in collecting water levies/tariffs and considerable environmental damage to rivers by gold panning and deforestation.

Methodology

The paper is based on an exploration of literature on customary law in Zimbabwe specifically and Africa in general. Case studies are used to demonstrate the inherent conflict between formal legislation and Shona water use and management practices on the ground. The case studies heavily tape into the authors' understanding of the basic structure and function of the Shona judicial system, which is in turn a product of the Shona people's worldviews. The paper magnifies those views in order to bring out the influence that they have on water resources management. The case studies are drawn from the Mazowe and Manyame catchments (see figure 1), where the Centre for Applied Social Sciences (CASS) water research team closely followed developments in the water sector reform programme for more than six years, beginning from 1996 up to 2002. The case studies demonstrate the resilience and relevance of indigenous institutions and worldviews for the management of resources in the face of an extensive water sector reform programme. The paper also makes use of insights gained during those six years of research carried out at CASS to provide discourse, conclusions, and recommendations.

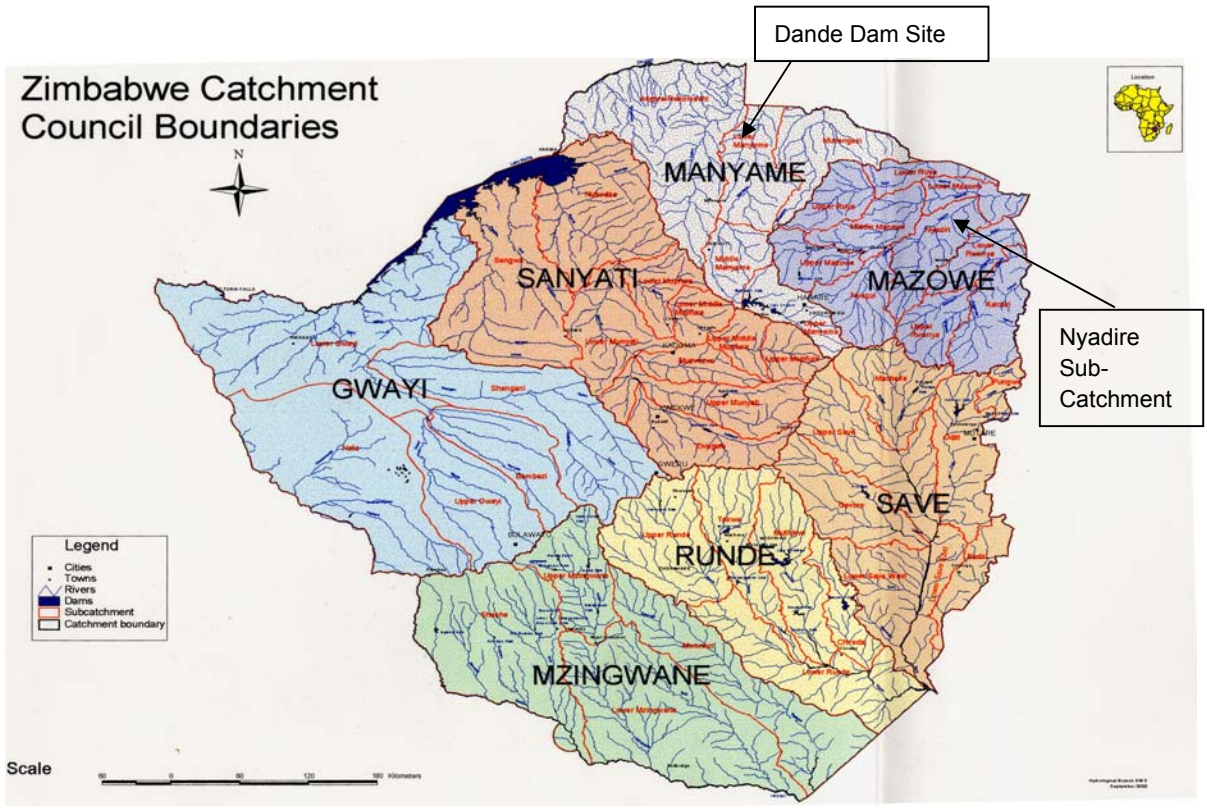

Figure 1. Catchment council boundaries and location of case studies

Source: Hydrology Department, Zimbabwe (2000)

Legal pluralism

Most developing countries instituting water sector reform programmes have to contend with plural legal and institutional frameworks that govern resource use. May (1987, 21) describes legal pluralism as a situation where the transfer or introduction of one system is superimposed on an existing political structure or culture. Attempts to unify legal systems in both colonial and post-colonial Africa have generally met with very little success. According to Hooker (1975, viii) despite political and economic pressures, legal pluralism has shown an amazing vitality as a working system. Zimbabwe has not been an exception to the existence of legal pluralism. Nemarundwe (2003, 28) points out that in practical terms, communities in the communal areas of Zimbabwe are governed by resource systems that have multiple rules (State, RDC and local) with multiple legitimation bases (e.g. legal and customary) and different enforcement structures and processes.

Customary law and practice

"Both law and custom comprise that code of rules approved by tribal tradition; the hereditary body of established conduct; that which has been observed, recognized, and enjoined from time immemorial, and handed down by the fore-fathers" (Posselt (1935, 44). This definition posits two fundamental elements of customary law. Firstly, it is approved by tribal tradition (communally agreed upon), and secondly it is handed down from generation to generation. However, law (customary or otherwise) is not static. It changes as society adapts to changing social, economic and political circumstances. To what extent can that body of law and practice remain customary when it is subjected to so many pressures? Goldin and Gelfand (1975, 28). Two important points emerge. Firstly, the colonial era had a profound impact on the nature of laws and resource use patterns such that it diluted or altered what was hitherto customary (Goldin and Gelfand, 1975, 28; Bryde (1976, 108). Secondly, colonial practitioners embarked on recording customary law so that it would be in a form they were familiar with and to make it more readily accessible to others involved in administering justice.

We define customary law as any rule or body of rules whereby rights and duties are acquired or imposed, established by usage in a community and accepted by such community in general as having the force of law. This also includes customary laws as modified by external forces and pressures and the influence of statutory law. Customary behavior is perhaps best defined as what people consider seemly - what is fitting and acceptable in given situations. Because of its generally unwritten, flexible and adaptive nature, it may exhibit considerable complexity. This adaptive quality provides the elasticity that underpins its resilience. Customary law seeks to enforce society's perception of what is normal, what is just and what is consistent with its worldview. Such adaptations are iterative and they lie within the shifting landscape of the peoples' notions of what is culturally acceptable. They conform to society's current values. Customary law in this sense is not something that was, but something that is (Katerere and Zaag, 2003). "A particular society is a going concern – it functions and perpetuates itself – because its members, quite unconsciously, agree on the basic rules for living together" (Foster 1962, 11). Culture and customary behavior are reflections of society's perceptions and worldviews. They are learned while practicing them. They are the embodiment of society's legal institutions.

There however, exist basic differences between Roman-Dutch law (the Common Law of Zimbabwe established through statutes) and Shona customary law that are as fundamental as the differing worldviews that produced them. These are:

- African law is unwritten. In the western world, all legal systems are recorded and characterized by a high level of certainty and precision (Bennett 1985, 17).
- African laws are not always clearly defined. They can vary from district to district and even within the same district (Goldin and Gelfand 1975, 10).
- Customary laws are directly validated by community acceptance - Western law is validated by legislative enactments, case law and judicial precedents.
- Because of its written and codified nature, western law is the preserve of professionals who engage in the esoteric work of interpretation, application and creation of rules (Bennett 1985, 17). Africans understand their laws by virtue of being and living as Africans. African Customary courts are open to all and there are no restrictions regarding evidence.

- Shona law makes little distinction between criminal and civil law. All litigation was and is still aimed at reconciliation (see Bourdillon 1976; Holleman 1955; Goldin and Gelfand 1975, 78; and Dande case study in this paper). Compensation for the injured parties is the prime objective rather than punitive punishment of the transgressors. "The objective of traditional courts or tribunals in Africa was to reconcile the disputants and maintain peace, rather than to punish the wrongdoer.

Structure and function of traditional Shona society

Ideally, a Shona polity (chieftainship) consists of nested levels of governance, starting at the village. A number of villages, typically between twenty and fifty, comprise a ward. Several wards comprise a chieftainship. Legal proceedings invariably commence at the village level. At village level it is important to heal ruptured relationships and restore peace and harmony as quickly and effectively as possible. Compensation or restitution of rights for aggrieved families is the best way to restore harmony. If it is not possible to reconcile disputants, then the matter is referred to the court of the ward headman. The chief's court is the court of final appeal before entering the State system of district courts presided over by professional judicial officers. Judgments in the lower tribunals (especially at village level) were and are hard to enforce if parties cannot be reconciled by arbitration. Only chiefs or semi-autonomous headmen could/can enforce judgments – and even chiefs (since the Colonial era) have sometimes had to resort to the state system to enforce judgments in the light of refusal by litigants to abide by their judgments.

Traditional courts were weakened by the "peoples' courts" introduced after independence. Nevertheless, they continued to operate as forums for arbitration. With the resumption of authority implied by the Traditional Leaders Act (1997), the courts of chiefs and headmen (through their "assemblies") are likely to assume a more positive role in the legal and social framework of the lives of rural people. There are problems with governance and the management of resources at the lowest (village) level. First of these is that of maintaining congruence with ecological or resource scale. In the case of water, a village community may have a limited vision of how to manage a river system. Empirical data suggests that the unit of management best suited to compromise between the need for local level management and the demands of scale and practical governance, is that of the traditional ward. It is generally at this level, that an accumulation of authority provides the ingredients for ecological resilience without detracting from the need for a clear perception of the necessary links between authority and responsibility. For management of resources to endure, it is desirable that there is an alignment of authority, responsibility and incentive (Murphree 2000, 4). At the ward level such an alignment is possible because the unit is still small enough for most people to know each other on a face-to-face basis, while large enough to encompass the ecologies of scale. It is perhaps for this reason that Shona society recognizes the court of the chief as the first level of formal indigenous governance. It is at this level that customary law is made operational. The ward best fits the definition of "community" which we use as a working hypothesis.[2]

Shona worldviews

Traditional Shona religion (which is still strong today) centres on the belief in a Supreme Being (God). God is generally approached through a hierarchy of spirits, representing departed members of society. In traditional Shona religious belief, the founding ancestors of the most powerful royal lineages converge and merge with the spirit of the Supreme Being. Another important perception is represented by the dictums*: "*The land is the people" and "the chief is the people, the people are the chief." By the authority of their acceptance of his station, the people determine the power and position of the chief. These maxims encapsulate an institutional reality that has profound implications. They suggest that the head of a socio-political unit (be it village, ward, chiefdom or state) governs by general consensus. And as the people are also the land ('the land is the people') and its resources, this worldview embraces a notion of Man and his environment in ecological union. These views are magnified in two case studies presented in this paper. These world views influence the resource use behavior of the Shona people in a way that creates a gap between the demands of statutory law and actual (customary) water use practices on the ground.

Manyame catchment: Dande dam and irrigation scheme

The Dande River rises on the Great Dyke and flows through Guruve Communal Land to the Gota Hills where it plunges over the escarpment to the lowlands that have taken its name. It then flows on to merge with the Manyame

before debauching into the Zambezi. In many parts of the area the two rivers traverse, the *mhondoros* (founding ancestral spirits*)* are revered and held in high regard by the inhabitants. Territorial boundaries delineate the areas of influence for different *mhondoro*, mirrored to a greater or lesser degree by current chiefdoms. The *Mhondoro* territories are also arranged in nested levels. These have been labelled spirit districts and provinces and culminate in "commonwealths" (Latham, 1987). These domains of the spirit world are profoundly territorial, indeed ecological. They are concerned with the care and management of the earth. It is underwritten by what has been called a "philosophy of the Earth" (Schofeleers, J. 1999:2).

"There exists a type of cult which functions for the whole community …and which is at the same time profoundly ecological" and "what sets territorial cults apart from other religious institutions is the combination of communal and ecological concerns" (Ibid; 2). Characteristic activities of these so-called territorial religious institutions are rituals to counter-act drought, floods and other environmental events. More positively they function as arbiters of a community's well being: its crops, livestock, fishing, hunting and social cohesion. This conclusion is very much the essence of what may be called "Indigenous Holism". It echoes Hunt and Berkes (2000) 's notion of "people in environment" or what we have interpreted as "environmental dwelling". The *mhondoro* are served by spirit mediums*,* who reside at sacred sites, sometimes described as cult centres.

In a narrow gorge in the Gota Hills of the Zambezi Escarpment, the colonial administration built a concrete bridge across the Dande River that was breached many years ago. It was never re-built. Recently, a much more ambitious project has been undertaken by the Zimbabwean Government, first with German donor support, and more recently with aid from the Chinese, through the African Development Bank. However, local support for the dam has been less than enthusiastic. Many people will be displaced once the dam fills. They are not likely to receive much benefit from the construction as the water is to be channelled down to the Zambezi Valley. The Germans pulled out of the scheme due to local resistance.

In 2001 a team of Chinese engineers moved onto the dam site. There was minimal consultation with the locals. However, there was an understanding that Chingowo's grave would not be submerged (Chingowo is remembered as the founding ancestor of the Guruve people). When the villagers discovered that this undertaking had been broken and that the dam would drown this sacred place, a revolt against the dam was mounted led by seven spirit mediums, including the mediums for Chingowo, his sons Swembere and Dandajena; the spirit medium for the pre-Chigowo autochthonous leader Nyamapfeka; Mutota (founder of the Mutapa dynasty) and his senior kinsmen. This combined *mhondoro* congregation represented not just the people whose homes would be flooded along with the sacred gravesite of Chingowo, but the peoples of the Valley floor, the area commonly called the Dande, where the planned irrigation scheme is to be introduced. It thus represented a general resistance to the proposed dam and the intended irrigation on the valley floor. Concurrent with the formal and ritualised protest from the *mhondoro*, villagers obstructed the construction work and vowed to burn the bulldozers. Dande villagers also expressed grave misgivings about the benefits of the proposed irrigation scheme (Sithole 2002).

We attended a meeting of angry local villagers which took place in June 2001. They requested us to report to the District Administrator (DA) that they would set fire to the bulldozers unless the spirit of Chingowo was appeased. The seven spirit mediums were demanding a large amount of compensation for the anticipated desecration. This amounted to 25 head of cattle and a sum of money in the region of Zimbabwean $10 000. Until and unless this was paid, work on the project was to cease. Subsequently, the DA held a number of meetings (one memorable meeting saw him actually chased away by angry locals) before an agreed compensation was arrived at. The *Mhondoro* articulate and validate public opinion (Latham 1987; Bourdillon, 1976; Spierenberg 2003). In extreme situations *mhondoro* also mobilize community action. People are prepared to risk central state authority if it is clear that they are acting out a compelling instruction from their *mhondoro*. This shields them from direct responsibility and excuses their apparent defiance of superior political authority. The Chingowo grave-site issue was a clear signal that the population was unhappy at the lack of consultation that had taken place. They demanded to be heard, and what better way than through the mhondoro with their strong religious and ritual significance as the "owners of the Earth. It is interesting to note that their strategy was to seek compensation rather than bar the project completely. It is clear from this that the people were more opposed to their exclusion from the planning and implementation of a

scheme that directly affected their lives and their rights in land and water than they were to the notion of development per se.

Below the escarpment on the valley floor, the Dande Irrigation Scheme (DIS) envisages the water from the Dande Dam being transported via a tunnel, to the Dande area (Zambezi Valley), where it will provide water for the irrigation of some 5000 hectares of land in Chief Chitsungo's area. This area has already been subjected to considerable resettlement of local people, and the influx of many "outsiders" consequent on what was termed the Mid Zambezi Project. This was a top-down intervention introduced by Central Government shortly after Independence in the 1980's designed to rationalize settlement patterns and to accommodate the many people who were moving to the Valley seeking land for agriculture. Its most controversial component was the moving of people away from the river banks where they had lived for centuries and prohibiting the use of riverine alluvial soils for cultivation. It met with sharp resistance and was the cause of a protracted struggle (with the *mhondoro* playing a prominent role) between the original Valley people and the central planners, in which Central Authority ultimately prevailed though individual victories went to the *mhondoro* and the people native to the Valley (see Derman 1990, 1993; Spierenberg, 2003). The Dande irrigation Scheme would mean that people already resettled would be "resettled again – this time onto small irrigation holdings about 2 hectares in size.

Opposition to the scheme was inevitable, except from those who had settled more recently in the area. "The indigenous Korekore people, it seems, are generally skeptical and worried about the Dande Irrigation Project (DIP)… particularly on social and cultural structures. They felt that the DIP would further entrench the ever widening gap between the original indigenous valley people and the 'settlers' who seem to have control of the political and economic aspects of life in the valley" (Sithole, 2002).

Plans for irrigation using water from the Dande and Manyame were being investigated by the parastatal, Agricultural Development Authority (ARDA), as far back as 1992. A supplementary scheme was also being investigated by The Department of Agricultural Extension (AGRITEX). Central to the plans of these schemes was the use of a natural pool in the Dande River as a storage and abstraction point. Mushongaende Pool is sacred. "In this pool there are lots of things which belong to different *mhondoro*….There are *njuzu* and *tsunguni* (water spirits). There are drums.. which are herd playing and people can be heard singing…People from Chitsungo family are not allowed to go to the pool" (Spierenberg 2003, 140). In 1994 a team from Agritex started work near the pool. At the same time a team from ARDA arrived to initiate their plans for the Dande Scheme (Both projects were being planned without any knowledge of the other). No one in the area had been advised. When they questioned the officials, they learned for the first time, of the proposed irrigation schemes involving redistribution of land. "The plans were received with great suspicion" (Ibid; 140). Shortly after starting their work the engineers experienced two car accidents and there were mysterious occurrences involving bateleur eagles following them (these birds are regarded as sacred messengers of the *mhondoro*). A man who allegedly saw a goblin disappeared into the bush for four days returning in a state of bewilderment. This caused the team to express concern. Even though they were technocrats from outside the Dande they were nevertheless, sensitive to the apparently supernatural interventions taking place and directed against them. They were eventually directed to Chief Chitsungo. He in turn demanded that the scheme be explained to his people. He also referred them to the *mhondoro*. A long drawn out struggle ensued. In the process, those in favour of the scheme seem to have recruited a *mhondoro* who argued in its favour. Despite this the scheme has not materialised, due to "cultural problems". Opposition to the notion of large-scale irrigation using water from the Dande dam and supplemented by Manyame water, is still an issue.

In the winter dry season of 2003, the Lower Manyame Sub-catchment council (LMSCC) responded to a Government appeal to grow an irrigated winter maize crop in the Dande. They approached ARDA with a plan to grow maize on land occupied by Chitsungo villagers, adjacent to the existing Mushumbi Pools ARDA farm. A local councillor for the area reported to the Council that local villagers were in favor of the idea provided they receive some benefit from the crops. ARDA were mobilized to clear and plough about 100 hectares, which would be irrigated from water derived from ARDA water (Manyame River water for which they have an abstraction right). In the end nothing happened. We observed that there was no real intention by ARDA to pursue the plan for fear of engendering the hostility of villagers and that the councilor's assertion that they were supportive of the plan

was motivated by his ambitions rather than any genuine desire on the part of the people to give up their land for an ad hoc cultivation plan.

Field data throughout the communal lands of the LMSCC (and in the Mazowe catchment) area suggests that large-scale irrigation schemes are not generally favored by the Shona people. There is a rather strong preference for small and micro-irrigation projects. These are perceived as manageable by the people themselves and (a very important aspect to them) do not involve movement or re-settlement of people. Moreover, micro-irrigation (defined as irrigation by householders or a small group of neighbours) is consistent with their notions of landscape. A major complaint voiced by the people in all areas we have carried out research is the lack of genuine consultation by State and local government officials. As one respondent expressed it, "this is our land and our water. How can these outsiders come and plan without consulting the 'owners of the Earth?" In addition, small-scale and micro-irrigation is at a level not penetrated by the state or second tier government structures. Here local customary rules and institutions) prevail.

At no other level or scale is there congruence between the institutions of management and the resource being managed. Catchment Council (CC), Sub-catchment council (SCC) boundaries, and RDC ward boundaries ignore the realities of traditional resource management spatial units. They sometimes coincide with traditional boundaries though they do not recognise them. For example, the newly formed Manyame Catchment Council, is divided into sub-catchment councils. The boundary between the Middle and Lower Manyame sub-catchments is the watershed dividing streams and rivers flowing into the Mukwadzi and Mutorashanga Rivers. This is roughly coincidental with the original boundary drawn between Chingowo and Zvimba areas in the sixteenth century. When the boundary was explained to councillors of the Lower Manyame SCC, Chief Chisunga expressed great satisfaction as this coincided with "our true boundary that was demarcated by our *mhondoro* long, long ago" (Meeting of the LMSCC, June 2000). His pleasure was short-lived when he discovered that half of his area as chief fell into another subcatchment area for purposes of water management.

As this paper is being written, the Dande Dam is once more under construction. However, prior to the return of the Chinese construction team, a delegation from the Lower Manyame SCC visited the senior *mhondoro* and made presentations to them of snuff and black cloth. Chigwedere (1980) explains that the cloth is used by the mediums for their ritual attire. It is often faced with white and is known as *hungwe* cloth. *Hungwe* is the fish eagle and also the totem of the very earliest proto-Shona migrants to settle in Zimbabwe in about the second century AD. These early Shona peoples are identified by their totems, all being associated with water, the very essence of life. Dzivaguru, the Great Pool, is a synonym for God. A visit to the dam site in December 2002 by the Lower Manyame SCC culminated in a tour of the proposed dam wall. Here overlooking the remains of the old wall and the birth of the new, councillors requested one of their colleagues (the chairman of ZANU (P.F.) Guruve district development committee) to pray to the *mhondoro* for the dam project to be successful. Significantly, this supplication included a suggestion to the spirits that they should be more accommodating since the dam was now being built by children of the soil. By September 2004, work was still progressing on the construction of the dam wall and spillway but only after foreigners and local bureaucrats have been reminded of the "weapons of the weak".

Mazowe Catchment: insights from a water allocation workshop

We attended a series of consultative workshops (a total of five) organized by the Mazowe Catchment Council in different sub-catchments Mazowe catchment to introduce to the communities and other stakeholders the proposed proportional water allocation system as part of the water sector reform program. Insights presented below are from the workshop held in the Nyadire Sub-catchment. Views and feelings presented at that workshop generally reflect those displayed at the other workshops. At the Nyadire workshop the participants were composed of three chiefs, 15 headmen, 2 RDC councilors, 13 members of the various water user boards that constitute the Nyadire SCC and 18 ordinary people from various villages in the Sub-catchment. Generally, people had been elected to the WUBs and SCC though it must be acknowledged that the traditional authorities had been sidelined since the elections. The chiefs present indicated that they were not sure why they were invited to the meeting on this day especially given

that they had not been formally part of the water reform process right from the beginning. They stated that most people did not know what water permits are all about, this meeting was the first time that they were being introduced to such issues as well as being asked to participate actively. They further said, "as far as water is concerned, most people follow the ways of their forefathers and are not aware that this or that particular type of water use is illegal."

The chiefs and headmen in the workshop could not conceptualize and understand the idea that water could be shared (allocated), and they even found it amusing that anybody could talk about paying for water from the Nyadire river. This was expressed in statements like: "*We cannot share what is flowing, how do we plan or manage what is not there?"* With respect to the proportional water allocation system, most of the participants did not see the relevance of discussing the sharing of water that they either did not have or did not see. They felt that they could only talk about the small section of the river that they lived riparian to and not discuss water allocation in the whole catchment of the Mazowe. They also felt that they could not discuss 'water allocation' when they did not have dams in their respective areas to capture and therefore, 'allocate' the water. One participant said: *"We are wasting time discussing what should happen tomorrow when we have nothing and are unlikely to see these plans materializing. This is like buying a maternity dress for a woman who is not yet pregnant, you should build dams in rural areas first before you can talk about water allocation."* It became apparent that to most of the participants, the discussion was at best too abstract, meaningless, and irrelevant. That there were serious disagreements over the issue of paying for water, was very evident during this and the other workshops. However, most of the stakeholders involved accepted that there are circumstances under which payment might be justified, for example where a level of personal control is evident. They observed that the *"person who impounds the water is the one who makes the river dry."* Thus, it is acceptable that water stored in dams can be paid for but not that sourced from small weirs, boreholes, and pools. At the same time, water stored in private dams should become public property, at least for livestock and other domestic needs, when there is a severe drought.

The polarity between modern water management concepts and traditional worldviews regarding water became very apparent. The participants did not see the possibility of water conflicts emerging in their area since they have conciliatory dispute resolution mechanisms that they have been using since time immemorial. They also did not agree to the idea that water should be paid for except in certain very specific circumstances. One chief stated and the rest of the participants strongly agreed: *"This water that you want permits for, this water you want us to pay for, who is making it, who is its owner? This water in the Nyadire River has been flowing along the Nyadire River for many centuries, can we really start fighting for it among ourselves now, why would I want a permit for water that is flowing through?* The participants agreed that water comes from God and that no one has the right to control its use through an allocation system that requires that users pay for the water. One of the chiefs stated vehemently, *"The Queen of England could not do it, Ian Smith could not do it, the Mugabe government cannot do it, we have to rely on ourselves to find the means to realize our development objectives. We must be strong and we must do it ourselves. This is our country, our water, we want to share it equitably!"* His statement illustrates the resilience of customary laws and practices in surviving through different political regimes in the country. And yet another participant observed *"You have presented your thoughts to us about the proportional allocation system, whose water is this you are going to allocate? Is this not our water? You must not come here and confuse us, and then say we are being difficult!"*

What is apparent from the sentiments expressed by the people during the meeting is that the Shona people have an alternative governance system (customary) that they have relied on for many years. They still have confidence in the ability of that system to solve their water use and management problems. The new water use and management demands from the water reform programme are received with, at best, some bit of curiosity and, at worst, either absent-minded indifference or active resistance. In most cases, where the laws prohibit certain local practices, these practices are continued, although in discussions inhabitants will feign compliance or ignorance.

Water sector reform and customary law in Zimbabwe: the discourses

Customary laws have existed in parallel with statutory water legislation for many years in Zimbabwe. These traditional systems are particularly applicable in the area of conflict resolution, management of water and other natural resources. Despite the imposition by the state of a water regime in the first water act of 1927 that empowered a government department and a specialist water court, statutory regulations and procedures, and technical criteria for water management, areas of customary practice remained (Bolding et al. 1996, 193). An important aspect of economic development in Zimbabwe during the colonial era was the racially skewed model that denied the indigenous people access to resources and thus placed limits on economic and development opportunities. This trend was to continue even in the post-independence period. For example, within the irrigation sector in Zimbabwe by 1994, commercial farmers (predominantly white) still used about 84 percent of the available irrigation water while small-scale and subsistence farmers (predominantly black) used only 7 percent (Derman and Hellum 2001, 3). Consequently, water policy and law represent the complex interplay between multiple interests, priorities, and approaches that, as Derman et al. (2000) argue, are not always compatible. "The reform process is a site of tensions and conflicts between values and principles embedded in liberal economic thinking and more welfarist concerns embedded in both human rights and African customary laws" (Derman and Hellum 2001, 11).

Both case studies show that some of the principles advocated in the reforms indicate that rights to resources under customary law are conceptualized in a fundamentally different way from the requirements of statutory law. This has implications for the resource use and management model to be implemented. Several issues immediately arise, including the legitimacy of treating water as an economic good. In customary law and practice, water is treated as a god-given resource that all are entitled to use. Both case studies identify this as a real concern amongst rural communities in Zimbabwe (also see Bolding et al. 1996; Sithole 2002, Mohamed-Katerere 1996; Hellum and Derman 2003). Among the Shona, the founding ancestors are linked genealogically to even more senior sacred ancestors. The spirits of these "divine heroes" are merged into and become a part of the presence of god (Latham, 1987). By stating that water "belongs to God', people are saying it belongs to the land. And by saying it belongs to the land, they are saying it belongs to them. By implication, they say, the control and management of water should therefore be in their hands. The rural dwellers of today need water to satisfy their domestic requirements, to irrigate small vegetable gardens, to make bricks for constructing their houses, and to water livestock. For them, water must be accessible all the time regardless of whether this is enshrined in statute or not. They see it as a basic human right because it is a source of basic survival, water is life (Latham 2002).

Legislation enacted under the water sector reform program, stipulates that water users must secure water permits if they want to use water for purposes other than domestic. In continuation of past policy, Zimbabwe's waters continue to be divided into the categories of commercial and primary. This division reflects the plural legal system of imported Roman Dutch Law and Customary Law (Hellum and Derman (2003). However, the legislation is hazy on what constitutes water for commercial irrigation. Debate has been vigorous in the Mazowe and Manyame catchments regarding this sensitive issue - sensitive because many micro-irrigation schemes currently regarded as domestic could be reclassified as commercial, thereby rendering them liable to water permits and levies. Primary rights do not cover water used for irrigation. The definition of irrigation could be construed as including micro-and small-scale irrigation. "Irrigation means the artificial application of water to land for agricultural purposes" (Water Act 1998). As one chief in the Nyadiri sub-catchment stated, *"our concern is for our tiny gardens."* Is a 'tiny garden' adjacent to a perennial pool or dam an irrigation scheme or not? This haziness in defining what is commercial and what is domestic has the potential to worsen the clash between customary and statutory legislation. It also has the potential to raise feelings of betrayal among rural communities who are used to receiving water for free.

Among the Shona and other ethnic groups in the country, water use at the community level is ordinarily regulated by local water point committees or by chiefs, headmen or village assemblies. Community sanctions generally ensure compliance. Customary norms and practices appear better suited to handle enforcement of water use and management practices than the new institutions imposed by the reform programme. Unfortunately, statutory instruments give the responsibility for enforcement to other agencies outside the confines of customary law (i.e. the

new SCCs and CCs). These are agencies whose legitimacy is still in question because they do not fall into any of the existing frameworks of resource management (be it customary or otherwise) with which people are familiar. Seventy five percent of rural Zimbabweans interviewed believe that customary authorities should regulate water use (Derman et.al. 2000). Yet the customary authorities do not have any formal representation on the new stakeholder bodies. In the light of the water and land reform, we ask what kinds and forms of law will emerge from these apparently contradictory processes as the new black farmers move into areas that were previously occupied by white farmers? (Hellum and Derman 2003).

There are certain fundamental ingredients necessary for successful natural resources management. Amongst the most important of these are resilience, congruence, adaptability and the devolution of authority to the lowest appropriate level. Most of these requirements, as they apply to local communities, are congruent with the traditional institutional arrangements of resource governance. Over time, local level adaptive management employs considerable energy to molding, rejecting or modifying "outsider" interventions so as to fit their local institutional conventions. In the process the strengths or advantages of either system are often diminished and their operational effectiveness reduced. Nevertheless, at the local level, it is local knowledge that is generally best equipped to deal with complexity, uncertainty and environmental shocks.

Despite the introduction of the water reforms, water use and management in the communal areas in the catchments of our study have remained largely governed by customary laws and practices. Therefore, as scientists and practitioners, we would be sensible to recognize the strength, resilience and elasticity of local institutions as suitable instruments to manage and develop their own resources in a manner most likely to be sustainable. This can be done through devolution of power to appropriate levels. By the nature of their institutionalized devolution of power, through nested levels of spatial and jurisdictional authority, the Shona customary system of governance provides for systematic devolution and creates an environment for top-down, bottom-up and lateral accountability because of the dictum 'the chief is the people and the people are the chief'. Evidence abound (including the case studies) to illustrate that a major reason for failure of common property resources management lies in the reluctance or inability of central government structures to devolve power to appropriate levels of management. The alternative is to ensure that the existing resource management structures are taken on board when new initiatives are implemented. "The problem is that this requires also a shift of real decision-making powers from the national to the district and local levels. National power groups normally, however, strongly resist giving up power once they have acquired it" (Stohr and Taylor 1981, 471). The real threat to local level management of natural resources is therefore, not their lack of ability to manage. It is the lack of the external authorities' will to release their political hold on power that is the main factor inhibiting their ability to function effectively.

The Water Act of 1998 while purporting to decentralize jurisdictions has failed in this regard for it has made no provision for decentralisation below the level of SCCs, bodies that are tasked with managing spatial jurisdictions so large as to be dysfunctional and that do not recognise existing traditional institutions. Science has laid the empirical basis for substantive policy and political change. It has also suggested, however, that we have now reached the stage where experience must actively be applied in the political arena; with tenurial empowerment being the goal and the communities themselves being the actors (Murphree 2000). Murphree was addressing general issues of community-based management of natural resources but his comment has absolute resonance with integrated water resource management. It is the postulate of this paper, that the pivotal role of indigenous (traditional) institutions, based on accepted and understood worldviews, and enshrined in customary law and practice, may provide the practical and acceptable path for political acceptance of devolved community based management of resources. It may also prove an acceptable and exciting arena for academics and development professionals to find sustainable solutions to the problems of resource management.

Conclusions and implications for policy reform

Zimbabwe and other African independent states have in place plural legal systems composed of customary law (in its various forms) and the received or imposed systems of the colonizers. Customary law has, by and large, been shaped by the historical reality that it was adopted, applied, de-constructed, and adapted by the colonial experience

in ways that have distorted its development (Bentzon et al. 1998). Customary practice is almost always overshadowed by the reality of the supremacy of imposed State law. In the case of conflict between local people and the state, it is this imposed legal regime that is ultimately authoritative at higher scales of governance. Nevertheless, local institutions can and do have an influence on how exogenous interventions are applied. At the local level, the State lacks the capacity for sustained interventions in resource management, leaving space for customary practices to prevail (Katerere and Zaag 2003). Customary law is not static. It adapts to change thus providing an element of resilience. It is not easily obliterated by hegemonic state-crafted, statutory institutions and instruments that fail to recognise the nexus between law and practice. Legislation alone cannot bring about change. An understanding of customary law and the modalities of local resource management are essential for the creation of legitimate and viable resource management regimes.

Current models of water management based on western paradigms that ignore African institutional arrangements and worldviews are overly simplistic and inhibit efforts to deliver sustainable IWRM systems. "Perhaps indigenous laws somewhat modified, are more suitable as expressing unique cultural values"(May 1987). They need to be incorporated into the design of institutional frameworks thus providing legitimacy and congruence in the eyes of local user communities. Customary rights and usage of water should be recognized and incorporated into the formal legal framework of catchment management. There is no recognition of customary law or indigenous institutional arrangements in Zimbabwe's Water Act. Primary rights only partly meet the customary perceptions of "water is free to all users". Water for irrigation restricts customary access rights to water. The Mazowe case study illustrates this point. To legitimize and make operational the customary institutions of governance requires real devolution of authority and tenure over resources currently absent in Zimbabwean land and water legislation. It must be recognized that any serious intervention to formally incorporate customary law and practice into the water legislation will require in-depth research and advocacy. In this way process could lead to changes in policy and practice more suited to the realities of sustainable management of water and other resources.

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Notes

[1] A primary right entitles the user to domestic water, water for livestock, dipping tanks and brick making.
[2] "For the purposes of our topic community is defined functionally as a principle manifest in social groupings with the actual or potential cohesion, incentive, demarcation, legitimacy and resilience to organize themselves for effective common pool natural resource management at levels below and beyond the reach of state bureaucratic management." Barrow and Murphree 2001, 27)

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Understanding legal pluralism in water rights: lessons from Africa and Asia

Ruth Meinzen-Dick and Leticia Nkonya

Water rights, like the underlying resource itself, are fluid and changing; they necessarily connect people; and they can derive from many sources. As water rights are now receiving increasing attention from scholars and policymakers in developing countries, it is useful to examine the differences and similarities between land and water rights—as well as the linkages between the two. Without an understanding of the range and complexity of existing institutions that shape water use, efforts to improve water allocations may be ineffective or even have the opposite effects from those intended. Reforms need to carefully consider the range of options available. This paper reviews the multiple sources and types of water rights, the links between land and water rights, using examples from Africa and Asia. It then examines the implications for conflict and for water rights reform processes.

Keywords: water rights, land tenure, legal pluralism, customary law, conflict management, Africa, Asia

Introduction

Two images are often associated with the term "property rights": fixed stone walls - immobile, permanent, and restricting access to the resource - or a title deed - a piece of paper with a big red seal affixed in a government office. Neither of these images, which derive from European tradition on land, is very helpful in understanding water rights, particularly in Africa and Asia. Water rights, like the underlying resource itself, are more fluid and changing; they necessarily connect people; and they can derive from many sources besides the government. As water rights are now receiving increasing attention from scholars and policymakers in developing countries, it is useful to examine the differences and similarities between land and water rights - as well as the linkages between the two.

A starting point for this analysis is to consider why property rights matter, and why attention to water rights has lagged behind attention to land rights. Reasons given for attention to property rights are often addressed under four "Es" and a "C": efficiency, environment, equity, empowerment, and conflict reduction.

- In terms of efficiency, the arguments are often made that secure property rights are needed to provide incentives to invest in a resource. For water, this often means developing and maintaining the infrastructure, such as a well or irrigation canal.
- Environmental arguments are closely related: property rights provide incentive to protect the resource, and without property rights that are enforced, resources often become degraded.
- Equity relates to the distribution of the resource, and can be defined in terms of equality of access, particularly for meeting basic needs, or in terms of distribution of rights in proportion to investment that people make, or some combination thereof.
- The way rights are defined determines if people are included or excluded in the control of a vital resource for their lives. Holding property rights is thus empowering to individuals or groups, particularly control rights that recognize authority over how the resource is managed.
- Clearly defined rights are also held to reduce conflicts over resources during scarcity, which is a matter of growing concern with discussions of "water wars."[1]

Given this importance of property rights and of water, why has there not been more attention to rights over water? The induced innovation hypotheses argue that establishing effective property rights is costly, so find that as long as a resource is abundant, there is little incentive or need to define rights over it, but with increasing demands and scarcity, there is pressure to define rights (Alchian and Demsetz, 1973). This is seen in African history, where "frontier" areas with low population densities have generally had more loosely defined land rights than areas of high population densities, and as populations increase, land rights become more specific

(Besley 1995; Otsuka and Place, 2001). But while changes in land tenure institutions are more familiar, studied, and debated, changes in water tenure have received less attention. However, we also see that where water is plentiful, people often do not even know or care who else may be sharing the same river, lake, or aquifer. As populations grow, demands on water rise, for household use, agriculture, and industry. Those who use water are increasingly affected by the actions of other people. Coordination becomes more complex and more crucial. In one way or another, water rights institutions, expectations about what claims to water are socially accepted as legitimate, are constituted by such competition, influencing people's ability to obtain water.

However, water has several properties that mean that water rights cannot be determined in exactly the same way as rights to land and other resources. Water is mobile, and most water use depends on flows. After water is diverted, some evaporates or is transpired by plants, but much water also runs back through surface channels and aquifers to be reused further downstream. Cultivation of crops, planting or cutting of trees, and other changes in land use transform the quantity and timing of water flows into and out of aquifers and rivers. While much land is dedicated to a single use, almost all water has multiple overlapping uses and users. All uses not only withdraw some water, but also add something to the water that affects the quality for users downstream, and changes in water flows affect not only human uses, but also animals and the broader environment. Rights to water, and the consequent patterns of use, concern not just how much water is withdrawn, but also water quality and the environment.

The slippery nature of the water itself makes it more difficult to define water rights because of the need for so much specificity: *who* can use *how much* water from *what source*, *when*, for *what purpose*, etc. This specificity, in turn, combined with the fugitive nature of the resource itself, increase the costs of monitoring and enforcing water law. As a result, effective water rights require active management of the resource.

Improvements in water rights institutions can help reduce poverty, improve economic productivity and protect nature. But efforts to improve water allocations may be ineffective or even have the opposite effects from those intended, unless grounded in a good understanding of social institutions that shape rights to water, a careful assessment of the options available for improving water management and a willingness by those involved to experiment, adapt and learn from experience. The diversity of culture, environment, economic activities and other conditions means there is no one best way to improve water rights and water allocation institutions. The best route to better water management depends on where you are starting from, with many pathways available (Bruns and Meinzen-Dick 2003).

From this standpoint, the increasing attention to water rights in Africa is very encouraging, particularly studies that seek to address the complexity of rights over this complex resource. The remainder of this paper examines some of these complexities, and lessons that can be drawn, not only for water governance in Africa, but for other regions and other resources, as well. We first review the multiple sources and types of water rights, the links between land and water rights, then examine the implications for conflict and water rights affects attempts for water rights reform processes. Most of the emphasis in the paper is on how water rights—defined at different levels—affect people, and hence on the local level, but the concluding section on reform processes also addresses water rights at larger levels.

Legal pluralism in water rights

Property rights can be defined as "the claims, entitlements and related obligations among people regarding the use and disposition of a scarce resource" (Furubotn and Pejovich 1972). Bromley (1992:4) points out that "Rights have no meaning without correlated duties …on aspiring users to refrain from use." This means that property rights are not a relationship between a person and a thing, but are social relationships between people with relation to some object (the property). Particularly in the case of water, rights also have corresponding duties that apply to the rights-holder—usually to use the water and dispose of wastes in a certain manner, and often to provide money, labor, or other resources to maintain the water supply.

The crucial point is that property rights are effective (legitimized) only if there is some kind of institution to back them up. In many cases the state is a primary institution that backs up property rights, but this is not necessarily the case. Particularly in the case of water rights, we find many examples of customary law (which nonetheless changes over time) that is backed by local authority and social norms. User groups may define their own rules for a waterpoint. At the other end of the scale, international treaties such as the Ramsar convention on wetlands generate yet another type of law that can provide a basis for claiming water rights. Particularly in Africa, where so many countries share in international river basins, treaties and other international law is relevant to the allocation of these shared waters. Irrigation or other water development projects generate their own rules and regulations, which constitute yet another type of "water law." Most religions also have precepts relating to water that can provide the basis for entitlements or obligations regarding water.

The pluralism of water law is further increased in many places in Africa because each of these types of law—especially state, customary, and religious—may themselves be plural. Government land laws may contradict water acts. Many communities have different ethnic groups living side by side and using the same water, but having different traditions regarding its use. In particular, many sites have farmers and pastoral groups, with different ways of life and ideas on water. The mix of religions adds to this plurality All of these types of law will be interpreted differently in different places, generating a plethora of local law.

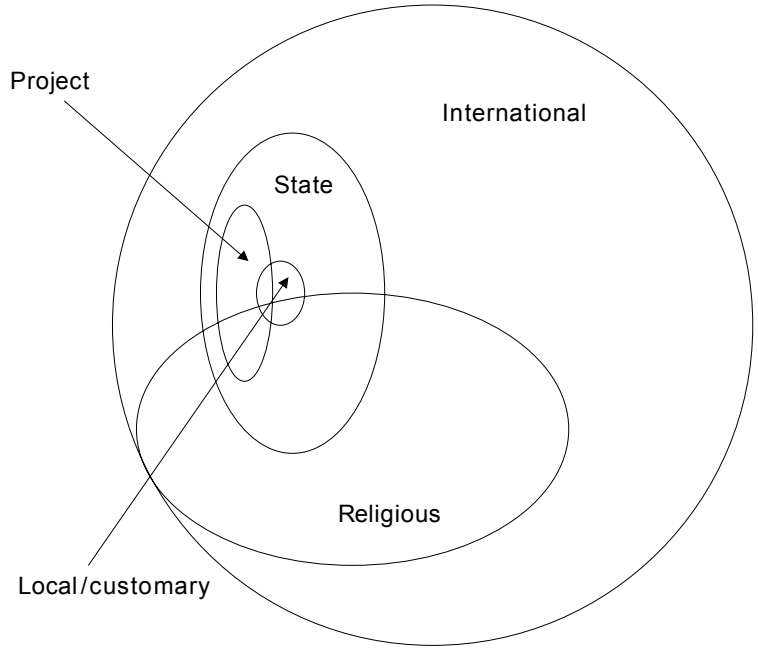

Figure 1. Overlapping legal orders relating to water

Source: Meinzen-Dick and Pradhan 2002

These different types of water law are not neatly separated; rather, they overlap and influence each other. Nor are all equally powerful—their influence will vary. Figure 1 illustrates these overlapping types of law, which can be thought of as force fields, with variable strength (Meinzen-Dick and Pradhan 2002). For example, customary law may be very strong and state law virtually unknown or irrelevant in a remote community with low migration and low penetration of state agencies, but in a heterogeneous community with high migration rates in the capital city, customary law may be much weaker than state law. In the case of rural land rights in Africa, Bruce and Migot-Adholla (1994) found that customary land tenure arrangements provided just as much tenure security as government-issued title to the resource. Given the even higher costs of enforcing water rights (compared to land rights), and the limitations of government agency capacity, especially in most rural areas, we

would expect that customary law, backed by local norms and community sanctions, would also be as effective as state law as a basis for claiming water rights in many parts of Africa.

Bundles of rights

As with rights over land or trees, water rights are not usually homogeneous "ownership" rights that permit one to do anything with the resource, but rather can be considered as bundles of rights that may be held by different parties. Indeed, because of the complex interrelations between these individual rights and rights-holders, they could even be considered as a "web of interests" (Arnold, 2002, cited in Hodgson 2004)The exact definition of these bundles varies, but they are often grouped into two broad categories: *use* rights of *access* and *withdrawal*, and *decision-making* rights to regulate and control water uses and users, including the rights to *exclude* others, *manage* the resource, or *alienate* it by transferring it to others (Schlager and Ostrom 1992). To these may be added the rights to *earn income* from a resource, which Roman legal traditions have referred to as *usufruct* rights (see also Alchian and Demsetz 1973). Rights to earn income from a resource (even without using it directly) can be separate from use and management of the resource, as when government departments collects revenue from water users, or when individuals or communities collect a charge from others who use water—a factor that is increasingly important in the context of water transfers.

An example from Kiptegan, a spring protection site in the Nyando basin of Kenya illustrates this:

- Because of strong local norms that no one should be denied basic water needs, anyone has the right to withdraw water from the pipe below the spring for drinking
- People may also use water for their cattle, but only from the cattle trough, and they are expected to help keep the trough clean
- Those community members who paid some of the cost of developing the spring protection are entitled to a higher level of service, including, if hydrologically feasible and they have paid for it, a piped water supply to meet domestic needs and some small garden uses at their homestead, and to have a say in selecting committee members
- The members of the committee, who provide additional time and labor, also have decision-making, or control rights, including decisions of who can join/who is excluded from the user group, and how the spring and its infrastructure will be managed. They also collect fees from the group members, but do not earn income from this themselves.

These represent a blend of customary law, "project law" (in the form of rules developed with external assistance when the spring was protected) and rules developed and modified by the user group.

While the exact definition of these bundles of rights varies from place to place, we find several common elements in much water law in Africa:

- The state generally claims some kind of ultimate "ownership" rights over water, which may not be felt at all at the local level, or it may require that individuals or groups who want to use or develop a water source need to get some kind of permission from the state.
- There are widespread notions that anyone is entitled to water for "primary uses," which are usually interpreted as basic domestic needs, as well as household gardens, but may include other productive livelihood needs. Islamic law has formalized this as a "right to thirst" for people and animals. Indeed, many African societies recognize water needs of animals as well as people. As one Kalengin proverb in Kenya says, "Even the hyena is entitled to water," with the implication that no one can be denied water (Leah Onyango, personal communication, 2004).
- While basic use rights are strong, they are also usually quite flexible. Rather than being clearly defined in terms of who can draw how much water, access rights are socially negotiated, either individually or by groups, depending on changing local circumstances (Witsenburg and Adano, 2003). In rangelands, Ngaido (1999) discusses the importance of *access options* for people to use another individual's or group's land and water resources under conditions like drought, which provides a measure of resilience against ecological stress (Ngaido 1999). Cleaver (1998:351) reports a similar pattern for domestic water in Zimbabwe: "As a precaution against drought, women rarely rely on one source of water but maintain access to a number of different supplies, often through reciprocal social networks. Incentives to

cooperate may therefore be indirect and relate to the need to maintain good relations with neighbors and kin a more general sense."

- Control rights of management and exclusion are often held by the local chiefs, groups, or individuals who developed the source. The effectiveness of these management authorities in setting and enforcing the rules, and in maintaining the source, varies greatly, as does the extent to which they are participatory or autocratic. Indeed, effectiveness and decision-making practices are related. In Burkina Faso, McCarthy et al. (2004) found that where the chiefs made decisions in collaboration with community members, rather than by themselves, there was a significantly higher cooperative capacity, which led to better resource outcomes. Similarly In Zimbabwe, Cleaver (1998:355) reports: "critical decisions about the rationing of water from particular sources are only successfully enforced in those communities where the decision has been taken at a meeting of the whole community rather than a committee alone. Consensus may enhance collective amanagement since it reduces the need for compulsion, monitoring, and sanction."
- Most state, customary, and religious law does not grant alienation rights (to sell, give away, or otherwise transfer one's rights to someone else).[2] More people can be allowed in, but there is no profit to an individual to give up their rights to water.

Types of water rights

As with other types of property rights, water rights can be broadly classified as public, common, or private property, according to who holds the rights, and particularly, the decision-making rights of allocation, which lie at the heart of water rights (Meinzen-Dick and Bruns 2000; Meinzen-Dick and Bruns 2003; Paul 2003).

Public water rights are rights held by the state, and in which the government allocates rights to users. The government can assert its rights over water by controlling the water allocation directly through government agencies, or by acting as a licensing or leasing agent for granting water rights (Paul 2003). In Zimbabwe for example, the water reform in 1990s declared all the water to be the property of state. People can get water rights through acquiring water permits, which gives them legal license to use but not own water. Water permits are issued in consideration of the needs of the applicant and the expected benefits of the proposed water use (Latham 2000, Mtisi and Nicol, 2003). In Mozambique, the Water Act of 1991 regards water as a public good. People cannot have private ownership of water sources but can obtain rights to use water by acquiring a water license (Vaz and Pereira, 2000). Water licenses are granted for a period of 5 years and are renewable. The use of water for primary needs like small irrigation, domestic use, watering the livestock, is free.

Common water rights refer to communal water rights where water can be used by people in ways that are specified by some community. For true common property, some form of community or user group should have rights to allocate water at some level, e.g. in specifying who may or may not use the water, in what ways. In most African customary water law, water is considered as a community property and private ownership of water is not recognized (WFP, 2001).

Private property rights are rights held by an individual or legal individuals like corporations (Meinzen-Dick and Bruns, 2003). In water, it is generally only use rights that are recognized for individuals, particularly permits or licenses that give an individual a right to use water in certain ways (Paul, 2003). In Botswana, for example, people do not need to acquire water rights if they are using the water for domestic purposes or for watering livestock. However, people are required to obtain water rights if using the water for irrigation or commercial purposes. In some cases private rights go beyond just use rights, to include the rights to allocate the water, as in Chile's tradable water rights systems, in which a right-holder can transfer that water to others through sale or lease. Although there are individual use rights in Africa, private water allocation rights are not widespread. There are some sources such as wells or small springs which are considered private, in which the rightholder has the right to allocate water from that source. For the case of a private water source like a well, an individual is required to obtain land rights to be able to construct a well on a particular land. After the well has been constructed, an individual holds the rights to both the land and water (Carlsson, 2003).

In most treatments of property rights, these types of rights are contrasted with open access situations in which anyone has unrestricted use of the resource. There are no specific rights assigned to anyone and no one can be

excluded from using the resource. It is the lack of rules in open access that is seen as contributing to the "tragedy of the commons," wherein resources degrade because of lack of control over their use or incentives for investing in its provision (Bromley 1992). Thus "open access" has taken on a very negative connotation in much of the resource management literature. However, in African discussions of water rights, the term "open access" often has a positive connotation, which others might association with the notion of human rights to water (e.g. Gleick 1999). In African countries the notion of free access is also applied to some rangelands, rivers and streams (FAO 2002). Many of these notions were developed under conditions of low population densities, and may not stand up to increasing scarcity and competition. However, although it is important to address the questions of who will manage the resource, how well, and why, if they cannot exclude others, and what consequences this has for the state of the land and water as they come under pressure, it is also important to recognize the value placed upon "open access" to water for all, and to seek ways to accommodate this for growing populations.

Although these different property rights regimes can be distinguished analytically, in practice they often overlap. The state may claim ultimate ownership of the resource, but recognize communal rights over water in a stream, and open access primary use rights for outsiders. When that same water percolates into the water table and is accessed through a well, it may be considered the private right of the person who built the well.

South Africa provides an illustration of these overlapping property rights regimes, and how they change over time. During the apartheid era, state water law was based on the English common law principle, which gave use and control rights over water to those who owned the overlying land. Thus, groundwater, springs, and even small dams on a farm were effectively private property. However, the customary law of most black communities held that there is no private control of water but the community leader like the village chief had the right to control and determine the use of water resources for the benefit of the whole community (Tewari 2002). The new government reformed water rights through the National Water Act (Act 36 0f 1998). This Act declared that the state is the guardian of all water resources in South Africa, but it also incorporated the African customary view on water rights by declaring water to be a public resource that belongs to the whole nation and needs to be available for common use by all South African citizens. All water required for basic human needs like drinking is guaranteed as a right (RSA 1998; Perret 2002). Under this act, people cannot own water but can be granted water use rights through a licensing system, which require users to pay for it. The money generated from water use charges is used for water service and management costs (Farolfi 2004,Tewari 2002). In rural communities, individual water users are authorized to have water use right without any payment, registration or licensing if the water is taken for reasonable use for domestic purposes, small gardening and for animal watering. If the water is used for commercial purposes, then individuals are required to obtain a legal entitlement to use water or license. Through the licensing system, an individual is granted water use right for a maximum of 40 years subject to renewal (Perret 2002). Regulations to public water rights are meant to control water use, and resolve problems which might occur as a result of water over use, and resolve conflicts as results of competing uses. There are thus public rights to regulate the resource, collective rights of communities to use water for basic needs, and private individual use rights under licenses.

Relationship between land and water rights in Africa

Much of the current attention to water rights reform now looks at ways of making water rights separable from rights over land. This particularly applies to well-publicized cases in the Western United States, Chile, and Australia, where growing demand for water for non-agricultural uses in cities and industries creates pressure to transfer water away from agriculture. However, from the point of view of much European statutory law, water rights have been a subsidiary component of land rights (Hodgson 2004). In much of Africa and Asia it is hard to identify the water rights because they are intrinsically linked to land. African customary land rights, in turn, depend on social relations—membership in communities or relations with land-allocating chiefs, for example. Indeed, in Ramazotti's (1996) review of the ethnographic literature on customary water law, most information about water rights came from discussions of land law or the institutions of chieftaincies, demonstrating how water rights are embedded in both land tenure and social relations.

Two very different environmental conditions—wetlands and semi-arid rangelands—illustrate the linkages between land and water rights. In wetlands, control over land also gives water. Here, land is more scarce than water, and hence it makes sense to concentrate on the allocation of land. By contrast, in dry areas, water rights are the key to control and use of land for pastures. Access to water points opens up the possibility to use large areas of grazing land for migratory pastoralists.[3] Enclosing a water point can make pastoral production—and even the lives of the pastoralists—unviable.

Keeping animals often overlaps with other land (and water) uses. On the more humid end of the spectrum, animals may be raised in agricultural areas, either by the farmers themselves or by pastoralist households. While there can be complementarity in resource use by letting animals graze on fallow fields and provide manure in exchange, there is also potential for conflict, especially where cattle must pass by or through growing fields to get to water. In the Kirindi Oya irrigation system in Sri Lanka, the irrigation development displaced pastoralists from land, and did not provide enough alternative watering points for the cattle. Although the cattle farmers' association was included in irrigation Project Management Committee meetings to address cattle damages to crops as they walked through the system to get water, they were not included in the decision-making about water allocation, to ensure that their needs were met (Meinzen-Dick and Bakker, 2001). On the drier end of the spectrum there are important overlapping uses between pastoralists and wildlife that are particularly important in Africa. The interactions between humans, livestock, and wildlife have often been studies in terms of land, particularly where parks or reserves are created for wildlife, excluding the people and their animals, but the interactions and even conflicts are often over water, particularly where tourism is developed and consumes large amounts of water (e.g. for swimming pools), or fences are used to exclude people from accessing water points, thus denying basic needs.

Both wetlands and drylands are important resources in Africa, and hence the principles of interconnected land and water rights are important to understand for these resources. But even in irrigation systems, land rights are the key to obtaining water. There are clearly demarcated areas of land that are entitled to receive irrigation water. In South India, for example, land is even classified according to whether it is supposed to receive one season of irrigation per year or two, and land values and taxation rates differ accordingly. However, the development of many irrigation projects has also disrupted land tenure arrangements by expropriating the land to be irrigated, and then reassigning plots in the new system. This is illustrated in van Koppen's (2000) study of the development of irrigation systems on *bas fonds* (wetlands) in Burkina Faso: women had held relatively strong use, decision-making, and even full ownership rights over the *bas fond,* where they cultivated rice. However, the project initially ignored the fact that women were the landholders, and assigned "household" plots to the male heads of households, thereby weakening women's rights—an example of project law and customary law clashing. The result was a fall in productivity despite the "improvement" of the technical infrastructure, because the underlying institutions—including not only property rights but also intra-household relations - were disrupted. Later sites under the project corrected this by involving the women in the land allocation.

In other cases of irrigation development, the state has expropriated all land in the area to be irrigated, and then reassigned (often smaller) plots within the irrigation system, as in Kenya, Malawi, and Zimbabwe, for example. The result may be stronger water rights, but weaker land tenure security, as the farmers cultivating irrigated plots often shift from holding relatively strong customary use rights to their land, to being "tenants" on government land, and subject to the threat of eviction for failure to cultivate in prescribed ways, which often include growing specified crops. Farmers thus lose many decision-making rights over their land, as well as uncertainty about the duration of their rights. And, because they often cannot transfer or sell their land in the irrigation scheme, they do not benefit from any improvements. This contrasts with the situation in much of Asia, where farmers generally have ownership rights to land within irrigation schemes, which provides for much greater security of tenure and a long-term view of irrigated production.

Even where land and water are not strongly connected for productive purposes (as for cultivation or herding), there are vital links between land and water rights. In Kenya, for example, there are strong norms specifying that everyone has rights to use water. However, much of the land has been privatized. In the Nyando basin, land buying companies bought land from large-scale white farmers, subdivided and sold all of the land to

smallholders, without regard for the slope or location of the plots relative to water. While no one should be denied water, it was not as incumbent upon land owners to allow people and their animals to cross their land to access the water. The result was that many people had no access to the springs or rivers, and hence could not get water, even for basic domestic needs. The few public access points, such as bridges, became overused. Moreover, communities faced considerable obstacles to developing water sources, if they could not control the land, as well. In the Kiptegan site referred to above, the spring development that benefited the whole community was only possible when, after discussions with ICRAF and government staff, several men with land surrounding a spring decided to devote that land to the spring protection, planting indigenous trees above it and setting aside an area in which people and cattle could (separately) access the water (Leah Onyango and Brent Swallow personal communication, 2004).

This spring protection offers a positive example of how the way in which land is used has a major impact on both the quality and the quantity of water resources, and thus on water rights. Unfortunately, negative examples come to mind more readily: cattle tracks or cultivation of hillsides contributing to soil erosion and hence lower water quality and silting up of reservoirs; pesticide use on farms polluting the streams and groundwater; deforestation or reforestation affecting the runoff rates. This linkage between land and water in hydrological units lies at the heart of watershed management programs. Swallow et al. (2001) point out that these relations are complex, and not all land is equally influential in this: there are particular types of land uses, including wetlands, riverine vegetation, and paddy fields that play critical roles as sinks or filters for water, sediment, and other flows. Unfortunately, the property rights to riverine vegetation and wetlands is often not clearly defined, nor are they under the effective control of a management entity that seeks to protect or enhance their watershed functions.

Alongside the burgeoning number of watershed management projects supported by governments and NGOs, land and water rights are increasingly being separated. Part of this is fuelled by government structures: land and water are specified in different statutes and administered by different government agencies. Even international and donor organizations recommending policies for land tenure often neglect to mention water, and vice versa. There are also fundamental differences in the conceptualization of land and water rights, with state law treating land rights in the abstract, without regard for their location or topography (as exemplified by the land buying companies in Kenya). Water rights, by contrast, are always very particular to location, time, and use. In reviewing both the functional linkages between land and water, and these divergences, Hodgson (2004) finds that "few formal mechanisms exist in law to ensure a co-ordinated approach to the allocation and administration of land tenure rights and water rights."

The growing trend toward integrated water resource management (IWRM) tries to link these, to overcome the divide that has been created by assigning authority over land and water to different government agencies. There are hopeful signs: Kenya's current land tenure and water rights reform are taking place in parallel, but officials involved in the two processes are at least consulting each other. But for reintegrating land and water rights, state law and institutions may not be the best starting point. Rather, it is useful to look to the ways in which land and water rights and management have been linked in a range of customary institutions, and seek to identify principles upon which appropriate land and water rights linkages can be built.

Water, rights, and conflict

Based on property rights theory and experiences with land, it would seem that clearly defined property rights - which, by definition, create shared expectations - would help to reduce conflict over the resource, particularly as it becomes more scarce. This notion provides part of the impetus for water rights reforms and formalization (Rodgers and Hall 2003). However logical it may be, it is not necessarily true. When a fixed expectation comes up against a fluctuating resource, that in itself can be a source of conflict. This may explain why customary water rights are so often ambiguous. In a collection of studies of water conflict in Nepal and India (Benda-Beckmann et al. 1997) a recurring theme is that local norms which form the basis for claiming water rights are principles rather than precise rules, subject to recurring negotiation. Indeed, in many of these cases it was attempts to formalize rights that often triggered conflict, rather than the use of the water itself. The same was found along Tana River in Kenya, where a government land adjudication program triggered violence

between Pokomo farmers and Orma pastoralists, who had historically shared the resource under more flexible tenure arrangements.

That ambiguous or flexible rules are particularly adapted to situations where the resource is very variable is seen in a study from Marsabit, a dry pastoral area in Northern Kenya. Although there has been recurrent violence and raiding between the different ethnic groups in the area, and both claimed rights to the water points based on different customary principles, Witsenburg and Adano (2003) found that conflicts actually *decreased*, rather than increased, during drought because: "Both ethnic groups claim ownership of the well site, but they both said that the other group had a legitimate claim as well, which they consider in crisis times of drought. Samburu/Rendille herdsmen said that the Boran have a rightful claim, because they have invested time, money and labour to develop the wells, whereas the Boran admit that the Samburu/Rendille have a rightful claim based on their history, having used this water site long before the Boran migrated from Ethiopia in the 1920s. … many [violent] incidents take place at well sites, though not because they want to capture the well or to fight for access to the well. If they would really like to use the well, they would approach the other group peacefully. Instead, they fight at well sites because these are profitable places to raid when there is a concentration of people and animals. … situations of drought and hunger, as in 2000, are different from other situations: they now have a common enemy to fight." Thus, a recognition of their interdependence and common need for water mitigates conflict over this vital resource.

Studies from Zimbabwe (Cleaver, 1998; Chikozho and Latham, 2005) have similarly found that customary water rights place a high value on conciliation and conflict avoidance. Although there may be rules governing use of water, there is a reluctance to punish rule-breakers. "Approximate compliance" is accepted, taking into consideration hardship circumstances of the rulebreakers. This is similar to *adat* (customary law) in Indonesia, which considers the intention behind an action as important as the act itself when meting out sanctions (Ambler 1998). In Sri Lanka, Meinzen-Dick and Bakker (2001) also found that communities allowed people to use water in ways that were against official government regulations when "they need it and there is no other source."

Aaron Wolf (2000) suggests that localized principles used to manage water and mitigate conflict could also provide valuable lessons for those dealing with water at the international level. Based on a study of the Berber in Morocco and Bedouin in Israel, he suggests that principles such as prioritizing uses and protecting downstream and minority rights can be applied to international waters, as well. From our examination of these cases we can suggest an additional principle to draw upon - the value placed on mutual survival, and the recognition that, especially in times of drought, there is a common enemy that competing users should cooperate to overcome.

Implications for water rights reform processes

Many countries in Africa have been, or still are, engaged in a variety of land tenure reform processes. Now due to a range of internal and external pressures, many are also embarking on water rights reforms. Comparing the impetus between land and water rights reforms, Hodgson (2004: 30) finds: "the concerns of water rights reform, scarcity and sustainability, are quite absent from the land reform debate." But on the other hand, "Generally speaking, water rights reforms have had fewer re-distributive or socio-economic objectives than reforms to land tenure rights. An exception is South Africa whose recently enacted Water Act seeks to implement the two key principles of the 1997 National Water Policy, 'sustainability' and 'equity' (Hodgson 2004: 28)."

Many land tenure reform programs (e.g. Kenya's Swynnerton Plan (Synnerton 1954)) have imposed western-style private property with cadastres and title. However, experience has shown problems with this approach in terms of the high costs and potential to exclude many people. Research on customary tenure (particularly in Africa) has also found that customary systems do not necessarily create tenure insecurity that limits investment (Bruce and Migot-Adholla 1994). Consequently, new donor and government plans take more nuanced approaches, starting with more attention to existing land tenure (e.g. EU, 2004). Even de Soto, a well-known advocate of land titling and privatization programs, argues that it is essential to understand the customary rules

and social contracts ("people's law") that that are already in place before implementing any major reforms: "Outside the west, extralegal social contracts prevail for a good reason: They have managed much better than formal law to build on the actual consensus between people about how their assets ought to be governed. Any attempt to create a unified property system that does not take into account the collective contracts that underpin existing property arrangements will crash into the very roots of the rights most people rely on for holding onto their assets (de Soto, 2000: 171). If that applies to land rights, it is even more true of water.

Yet water reform processes are often dominated by (statutory) legal scholars and/or hydrologists, and have not always started with a thorough understanding of existing water rights and governance systems. Programs of formalizing, registering, and individualizing water rights run the risk of creating "cadastre disasters" unless they learn from the experience of land tenure reforms, and take into account the range of existing water rights. In the remainder of this section, we examine how an improved understanding of the complexity of existing (pluralistic) water rights could contribute to effective reforms, and how the experiences from land and water rights reforms might inform each other.

It may yet be that the property rights school will be proved right, and rising demands and competition for limited water resources will prompt formalization of water rights in Africa, as well. These changes are taking place in land, both through state and external intervention, as well as endogenously through changes in the customary law itself (Otsuka and Place 2001). With rising populations and growing per capita water consumption - for domestic uses, intensification of agriculture, and industrialization - water uses and users are becoming even more interconnected, not just at the local level where face to face negotiations are possible, but over large distance, from rural areas to cities, and even across national boundaries. For example, in the Mara-Serengeti basin of Kenya and Tanzania, agricultural development in the upstream areas is affecting the quantity and quality of water available for the pastoralists and wildlife further down, a factor compounded by increasing tourism, which also creates high water demands. Some form of new institutional arrangements is called for to regulate or reconcile these competing demands.

Existing customary institutions are likely to be inadequate where the competing users are from different ethnic or religious background, so that they do not share the same norms and customs. Thus, the emerging water law is likely to be based in state institutions. When the competing users do not even share the same government, then some form of international institution is usually created. But as these decision-making and regulatory bodies move away from the institutions based on social relations, in which much customary water law is currently embedded, the users affected are likely to have less say in the decision-making. Just as importantly, they are likely to identify less with the other water users with whom they share the resource, or to understand and respect each other's needs. The lower influence on the rules and lower sense of identity with other users are likely to reduce compliance with the rules. The question is whether the emerging (national or international) governance systems that set and enforce water rights at these higher levels can build on the principles of social relations, personal contact, by including mechanisms for members of different user groups to meet and understand each others' needs? Such "multi-stakeholder platforms" may take longer to develop the rules, and may seem more costly than to just have "experts" do the work, but in the long run it may pay off through increased legitimacy, and hence higher compliance at lower enforcement costs.

At the same time, we should not romanticize customary system. There is ample evidence that customary law frequently reflects unequal power relationships in local communities. Such relationships greatly affect the ways in which land and water are distributed and managed. State law may seek to confer more rights on the less advantaged members of a given community, on paper at least. Formalization of water rights may also be called for to protect the livelihoods of existing users against new uses and users. This is especially relevant as water use increases, bringing local users into competition with other users.

However, there is ample evidence that groups like women or the poor often lose out in processes of formalization, particularly in land titling programs (Lastarria-Cornhiel, 1997). One reason they lose out is because such people often lack the resources (knowledge, time, travel, and money) required to get security of tenure through the state, but as the "force field" of state law increases, the customary security of tenure through social relations often weakens. It may be advisable for those who develop any water rights registration

programs to go through the whole process with a poor rural woman, to see exactly what it would take for her to get recognized rights through the state, and then modify the system to remove as many obstacles as possible for people like her.

Another reason that the poor lose out is that formal state systems often accord less recognition to the overlapping rights to the resource, on which many poor people rely (Hodgson 2004). We have seen, however, that both land and water rights have multiple uses and users. These multiple users often have some shared understandings on who, how, when and how much of the resource can be used, the inter-linkages between them, and perhaps even quality issues. These are often lost in tenure reforms, particularly privatization, because such conditionality is seen to increase transaction costs and hinder the efficient redistribution of property rights. Even when the state declares itself the owner of all resources, as the custodian for all the people, Hodgson (2004) finds that the effect is to deny customary rights as well as eroding local management authority over the resource.

Codification of rights does not allow for considerations of special circumstances, such as basic livelihood needs, that are given substantial weight in customary systems. This is partly due to limitations of state capacity to interpret individual circumstances, but it also derives from current emphasis on the "rule of law," which implies that everyone should be treated equally, without special considerations. Reforms of both land and water tenure often have the objective of "regularizing" all uses of water under the authority of a state agency (Hodgson 2004) or to "integrate all forms of property into a unified system (De Soto 2000: 162). Legal anthropologists who study the multiple types of "law" that abound in any society would suggest that this is not possible—that pluralism will always persist, in some form. But even if it were possible to fit all customary law within the ambit of state law, it may not be desirable, because the pluralism in water rights and basis for claims allows for dynamism, for adaptation to varying local circumstances (Berry, 1993; Meinzen-Dick and Pradhan, 2002).

One option that is increasingly used in land tenure reforms is for the state to recognize local authorities, who can set and administer rights within their areas. This builds on both local custom and uses the institutions to back those rights, instead of relying heavily on state apparatus, which is often costly or ineffective, especially in rural areas. Tanner (2002) discusses some of the challenges that this approach faced in Mozambique, particularly difficulties in codifying many different customary systems, protecting the rights of women (who are strongly disadvantaged under customary land law), and guarding against unscrupulous chiefs. To this list of challenges should be added variation in the capacity of local leaders and of communities to manage the resource. Effective management of the resource itself is required to make water rights effective, and if the state does not deliver this, then local leadership and collective action is critical. But such local institutions do not function well in every community; hence devolution of authority over water rights will not work well in all locations, and due attention should be given to local capacity-building, where needed.

Whatever institutional reforms are chosen, the state cannot simply wave a magic legislative wand or issue an administrative order, and expect to automatically change water rights on the ground. Effective changes - from de jure to de facto - require more than changes in the law itself: they need to become widely known, discussed, and even debated. South Africa's water rights reforms exemplify this. There was a prolonged process of public discussion over the Water Act, which not only served to refine the legislation itself, but to ensure that it was discussed and widely known, so that people can appeal to the new laws to claim their rights, and to see that the provisions of the law are implemented. The next step is to build the capacity of implementing institutions, which may require considerable investment of time, training, and other resources, particularly if multistakeholder institutions are to be developed (Seetal 2003).

However, it is not only statutory water rights that can be changed. Customary and even religious law also evolve over time in response to changing environmental conditions, livelihoods, and even changes in other types of law. Thus, a change in state law can stimulate changes in customary law.

The question of how such changes in state or local law will affect the poor deserves particular attention in water rights reform, given the fundamental importance of water. In particular, where state law makes special

provisions for disadvantaged groups, this can provide something to which they can appeal. But this, in turn, requires legal literacy campaigns so that even illiterate rural women will know of any new rights that they are supposed to be accorded.

Before rushing to formalize water rights—which has often involved either nationalization or privatization, it is important to consider the full range of options, including looking for new forms of property rights that build upon strong customary principles. There is an opportunity to build upon widespread customary norms that specify rights to water for basic needs. Here the international discourse and customary law come together in emphasizing water as a basic human right. However, because water rights are meaningless without an institution to back them, serious questions of how much water can be used will need to be addressed, as well as what incentives there will be for anyone to supply it.

True "open access" to water may be desirable (as indicated in much of the local law), but not feasible. Yet water rights reforms should strive to ensure that the basic principle is met: that water for basic livelihood needs will be available for all. Both restraint on use and investment in provision are required. Achieving this may require going beyond conventional measures of regulation or economic incentives, to also appeal to norms and values of sharing and caring for other, as well as for the earth. As Mahatma Gandh reminded us, over 50 years ago: "Earth provides enough to satisfy every man's need, but not every man's greed."

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Notes

1. Although there is considerable talk of "water wars," in fact there is little evidence of international violent conflict over water. Violence over water is more likely at the local level (Ravnborg, 2004).
2. An exception in customary law is where someone has dug a well or developed a source that is considered private, and can bequeath that source to heirs, e.g. under *Maasai* tradition (Potkanski, 1997, cited in Juma and Maganga, 2005).
3. In West Asia and North Africa, herders with large flocks increasingly bring water to their animals, rather than the reverse, but the higher costs of fuel and transport, as well as high poverty rates, make this less of an option in most of Sub-saharan Africa.

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Making water rights administration work

Héctor Garduño

This paper distills guidelines from experiences in Argentina (Mendoza Province), Chile, Mexico, South Africa, Sri Lanka, Uganda and Uruguay in designing and implementing their respective formal water rights administration systems, grouped in guidelines for setting up an enabling environment for implementation, for drafting "implementable" water legislation; for the implementation itself, and for making a water rights administration system a true water resources management tool. The last set refers to the most important challenge, namely "doing the right thing, not just the thing right". It also proposes a dynamic approach to water resources policy, law and regulations drafting, namely the "parallel track approach". Informal/customary systems of water rights are not specifically addressed in the seven case studies summarized herein; assuming – perhaps naively – that in most cases customary practices may be taken into account through stakeholder participation within the fold of formal water resource legislation. Therefore, a fifth set, namely guidelines for addressing plural legislative frameworks through stakeholder participation is also offered.

Keywords: water rights system design and implementation, water rights guidelines, water legislation drafting

Introduction

A system of water rights (permits to abstract and use water resources – Garduño 2003), based on formal water legislation (Caponera 1992 and Nanni *et al* 2003) is often first introduced as a means to reduce interference, avoid counterproductive conflicts and resolve emerging disputes between neighboring users. However, the development of a stable system of water rights has far wider benefits, since it provides a sound foundation for the development and protection of water resources and for the conservation of aquatic ecosystems. Also, certain other steps towards more integrated water resources management can only be effectively tackled when water rights have been adequately defined:

- fostering the participation of water users in water resource management
- implementing demand management programs
- ensuring water availability for new water resources development to address the needs of the poor
- systematic collection of water use charges to promote water use efficiency and to raise revenues for resource management
- possible subsequent trading of water rights to promote more efficient water allocation
- developing conjunctive use of surface water and groundwater resources

Regulation of freshwater abstraction from, and of wastewater disposal into, surface and underground water systems, and of water rights accruing as a result, is a recurrent feature of much modern legislation for the management, development, conservation and use of water resources. Regulating water rights, however, will not *per se* ensure that the relevant abstraction licensing and wastewater disposal permitting materializes. Enacting legislation is one thing, implementing it quite another. It is safe to say that, in fact, implementation tends to be the Achilles' heel of the process of reforming and modernizing water resources legislation.

Timely and effective administration is critical to establishing the credibility of such legislation and to ensuring public support for and compliance with it. Administration of the legislation is equally important to establishing the security of rights to water resources and hence to promoting private-sector investment. This should, however, take place in a context where meaningful protection is provided for basic human and environmental requirements while available water resources get allocated to users in an increasingly competitive environment.

Because of the dynamic complexities of the quality and quantity aspects of the water cycle, the human interventions in it and the many historical, social, ecological, economic and political circumstances that influence the use of water resources, water laws are very complex and success in implementing and enforcing them, not only in developing countries, is extremely difficult to achieve. Probably the most complex challenge water laws pose is the administration of water rights, i.e., the granting of licenses, concessions, permits and other comparable legal titles for the abstraction of water from watercourses, lakes and other expanses of surface waters, and for the extraction of groundwater; and the granting of licenses, permits and other comparable legal instruments for the discharge of waste and wastewater directly or indirectly into a water body or onto the soil. A perhaps more formidable challenge still is monitoring and enforcing the compliance of water users with the law in general and with the terms and conditions of such licenses and permits in particular. The difficulties stem from the complexities mentioned above, but also from the fact that in many cases legislation is drafted with limited regard for the institutional capacity to "absorb" it.

This paper, which mainly summarizes two FAO publications (Garduño, 2001 and Garduño *et al*, 2003) is equally directed at policymakers, lawmakers and government administrators. It has been written in the belief that laws and regulations will stand a serious chance of being implemented and effectively administered if the demanding complexities of the implementation and administration of systems of water rights, and of the associated licensing and permitting legislation are factored into the drafting of the legislation. But sound implementation may not be enough unless water rights administration serves the purpose for which it was established. To this end conclusions are offered as preliminary guidelines for the use of lawmakers and government administrators. The reports cited above include references to other sources.

Seven case studies illustrate this paper. The Mexican case is based on the author's experience as responsible for designing and implementing the water rights administration system as established by the water resources legislation in his own country, updated recently (2003) with one of his successors. The studies on the Republic of South Africa, Sri Lanka and Uganda draw from his experience as FAO consultant (during 1997-1999) on the implementation of water resources licensing legislation in those countries. The studies on Chile, Mendoza Province in Argentina and Uruguay, were prepared in 2003 by key role players in the administration of water rights system in each country.

The complexities mentioned above are further aggravated when plural legislative frameworks (formal and customary) coexist. This is the case in most countries in Africa. Nevertheless, the guidelines offered deal basically with the processes involved in the design and implementation of water rights systems, and in this respect they could be also useful in making the best of existing informal systems. Informal/customary systems of water rights are not specifically addressed in the seven case studies summarized herein; assuming – perhaps naively – that in most cases in the case study countries and perhaps in some African countries customary practices may be taken into account through stakeholder participation within the fold of formal water resource legislation. To this effect, some guidelines dealing with stakeholder participation are also included.

Conceptual framework

This paper deals mainly with the right to abstract and use water, but it must be recognized that the administration of such rights should go hand-in-hand with the administration of wastewater disposal permits and of water-resource fees or levies. Therefore, these three components are first dealt with, followed by a general description of the water rights administration process and of the implementation tools usually required for such administration to be operational.

Components

Water abstraction and use rights

A 'water right' usually constitutes the right to use (but not ownership of) the water itself. Lawyers call this a 'usufructuary right'. A water rights system (Garduño *et al* 2002) should have the following attributes:

- *requirement for effective and beneficial use of water***,** such that water resources cannot be obtained for speculation or let run to waste

- *reasonable security of water use tenure***,** including entitlement to compensation under some (but not all) circumstances when reduced, notwithstanding the requirement for efficient and beneficial use
- *flexibility* to reallocate water**,** to more beneficial social, economic and ecological uses, through periodic review or other mechanisms, rather than allocation in perpetuity.

Water rights are thus normally subject to a series of terms and conditions (Box 1).

Box 1. Terms and conditions usually specified in water abstraction and use rights

Term or condition	Comments
duration of right	allocation flexibility requires some time limitation (say 5-50 years)
point of abstraction and use	these should be specified and may be different
purpose of use	important to distinguish consumptive and non-consumptive use rights
rate of abstraction	specify annual maximum together with any short-term limits
specification of works	details of diversion, storage dam or well
environmental requirements	linked specifications of location/quality of return flow
cost of right (water resource levy)	fee usually paid for holding and/or using right
record of transaction	obligation to declare transfer of right (when permitted)
loss or reduction of right	forfeiture without compensation for non-use or non-compliance
suspension of right	as a penalty or in emergency without compensation
review of right	periodic adjustment with compensation according to supply/demand
renewal of right	facility to apply for continuation before expiration

Source; adapted from Garduño et al 2002

Wastewater disposal permits

These permits usually specify the amount of water a user is allowed to dispose of in a certain surface or groundwater body or onto the soil, subject to complying with a certain wastewater standard or to using a specified wastewater treatment technology. Since water abstraction from a water body may affect its natural pollutant assimilation capacity and discharging wastewater into it may affect its quality, it is important that both abstraction and disposal permits are considered simultaneously and preferably managed by the same agency or at least with close coordination between the water resources and environmental agencies.

Water resource levies

Notwithstanding the fact that most poor users in developing countries cannot afford the full economic cost of the water they use, and that social equity considerations may very well override cost recovery policies, thus making it necessary to introduce targeted subsidies, it is important for water resource managers and users to be aware of the components of such cost. Figure 1 illustrates the case of groundwater (Kemper *et al*, 2004), which is often undervalued. The exploiter of the resource (in effect) receives all the benefits of groundwater use but (at most) pays only part of the costs – usually the recurrent cost of pumping (providing the energy use of water is not subsidized) and the capital cost of well construction, but rarely the external and opportunity costs. This undervaluation often leads to economically inefficient resource use and groundwater excessive exploitation. Conceptually water resource fees or levies should include the resource administration cost as well as the opportunity and external costs.

In some countries also wastewater disposal levies are charged to control pollution; to be effective these charges should make the polluter pay more than is required to treat and dispose of the effluent according to specified standards.

The water rights administration process

"Implementable" legislation is one that the Government is able to administer and enforce, and water users have the ability to comply with. Figure 2 shows how the different actors may interact in the administration of a water rights system. In the particular case of a water use, the most important actor is the water user/ applicant/license holder. But other users in the same river basin or groundwater aquifer who may be affected by that use also play an important role. Stakeholders -even if they are not users of water- may also want to express their opinion

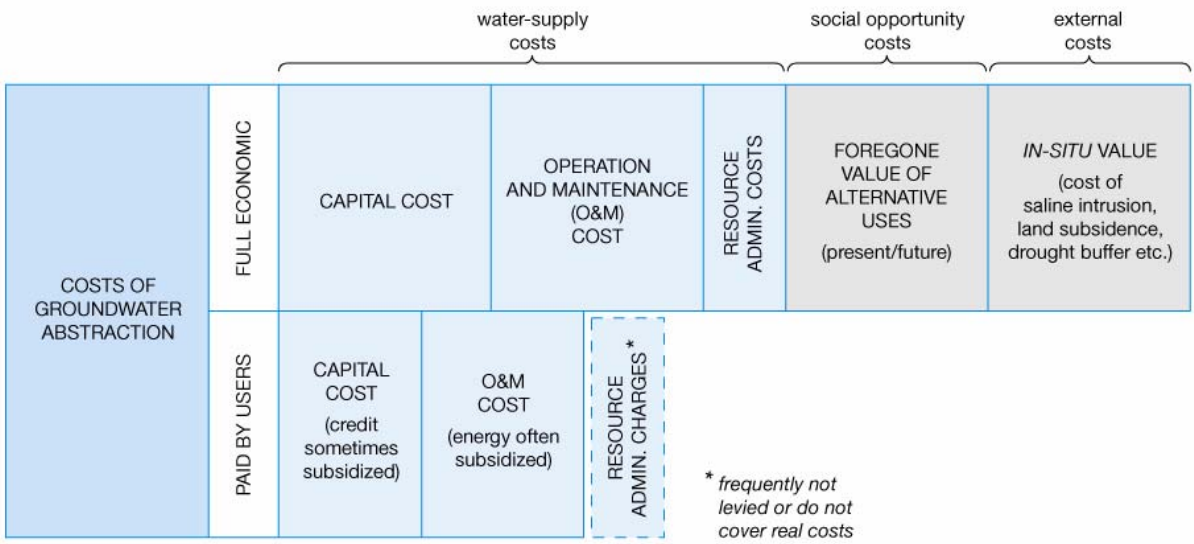


Figure 1. Measuring the costs of groundwater use

Source: Kemper et al 2004

regarding an application for a new water use license or permit, or file a complaint or lawsuit against an existing user, or appeal against the decision of the water authority. The water authority may deny the applicant a license or permit, or it may grant it and register it. Once the applicant is granted a license or permit, he or she becomes a legitimate and lawful user and must abstract water, discharge waste into a receiving water body and pay fees and charges according to the water legislation and the terms and conditions attached to the license or permit. The water authority keeps records and monitors the water users'/license holders' compliance through field inspections and other appropriate means of verification. On a finding of wrongdoing, the water authority will impose a fine on the user/license holder or seek prosecution by the judiciary if a criminal offence has been committed. In addition, the water authority and/or the judiciary may hear appeals from the user/license holder or from affected third parties, lodged against a decision of the water authority.

Implementation tools

When designing a water rights administration system and setting up a time frame for implementation, it is wise to be aware of the tools that may be required to implement it; otherwise an unrealistic system may result. Box 2 shows the usual kinds of implementation tools in a water rights administration system. It is needless to say that these tools should be designed as simple as possible and taking into account the existing capacity and information. For instance, only when enough hydrological data, trained personnel and hardware is available should sophisticated computer models be used for water resource allocation; otherwise simple spreadsheets and international water use indices based on socioeconomic information may be used (see the second guideline for an implementation strategy below). In effect, all these tools can be tailored to the specific situation of a country or region within it, and made as simple as required.

Case studies

Following is a brief summary of the seven case studies which are dealt with extensively in Garduño 2001 and 2003.

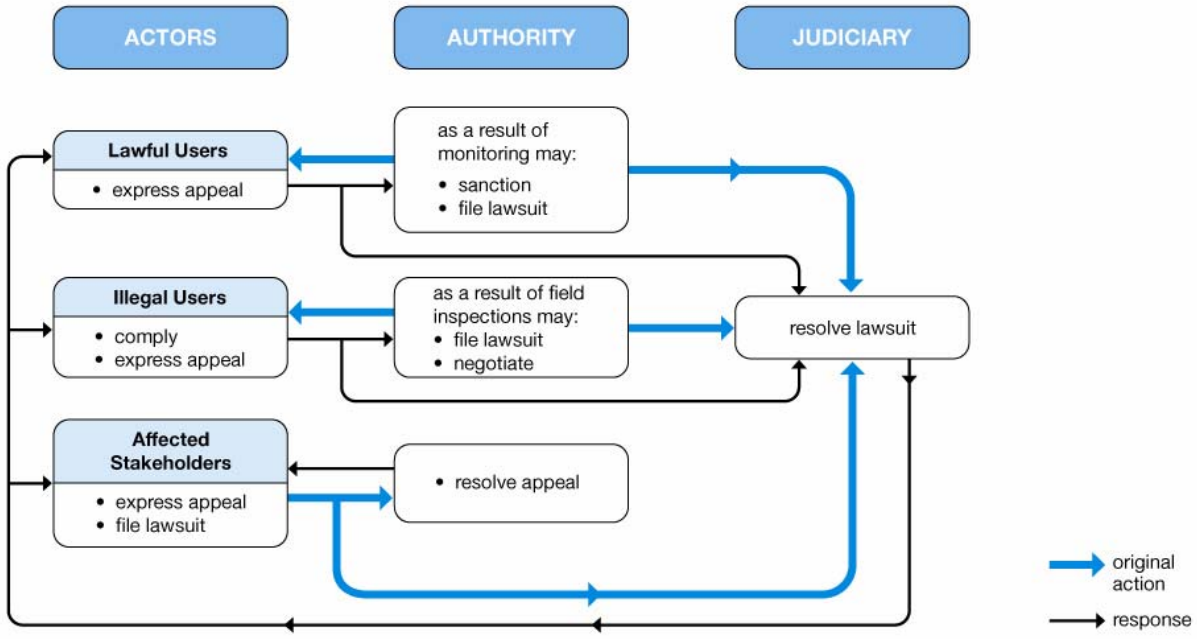


Figure 2. Main interactions in water rights administration

Source: Garduño et al 2002

Box 2. Usual implementation tools for water rights administration

Planning Models
- users and polluters model
- preliminary water quantity and quality balances for defining priority control river basins and aquifers

Guidelines and procedures for the filing, processing, granting and control of water abstraction and wastewater disposal permits
technical
- determination of ecological water requirements
- simple manual procedures and computer models for reviewing permit applications

managerial
- filing and processing applications, approval or refusal
- permit registration and public consultation of the water rights register
- applicant and user manuals
- monitoring of user and polluter compliance after permits have been granted (in this case, besides managerial some technical and legal aspects must also be included

Information system
- library management software to systematically safeguard, retrieve and release all documents involved in each application
- databases and follow-up systems to keep track of applications and permits
- databases and follow-up systems to keep track of users' and polluters' compliance with conditions in their permits and with 'user-pays' and 'polluter-pays' principles

Argentina (Mendoza Province)

The Province of Mendoza has the longest water resources management tradition in Argentina, because limited water availability has faced a continuously growing demand and pollution. The most pressing water quality issues are groundwater salinization, low coverage of industrial effluent treatment albeit 80% of municipal effluents are treated. Recently, wastewater reuse for irrigation of restricted crops has contributed to pollution control and proved to be an additional source of water whose allocation calls for new water rights to be issued.

A number of public and private entities are involved in water resources management, thus creating a complex institutional framework. Separate management for each water use sector has caused duplication of functions, slow decision making and regulation credibility loss leading to non-compliance. Nevertheless, albeit incipient, transfer of some management functions to strong water users associations is bringing users into the fold of the law but these organizations still need to be streamlined, inter-institutional coordination reinforced and river basin management established.

Mendoza has adopted several water resource management principles stemming from the Provincial Constitution that constitute the axis of the legal system. The main ordinance is the 1884 Water Law, which needs to be updated to face new water uses and increasing demand. Wastewater control has been uneven, but it is financially self-sufficient; the system relies on a polluting premises registry which facilitates regular effluent monitoring. The water users and uses registry is being updated through a geographical information system aimed at assessing existing water rights and simulating alternative scenarios in order to develop a long term plan. To sustain the water resource administration users pay a water levy, according to the kind of water use and whether the source is surface water or groundwater. In spite of water levies being low collection is difficult mainly because of the registry being incomplete.

The main improvements envisaged by some local water resource managers are: declaring all waters to be under public dominion, permitting water rights markets, updating the water rights registry, modernizing the administrative structure of the water authority, improving institutional coordination, streamlining application procedures for abstraction and wastewater disposal permit applications, establishing a water demand management program and a volumetric delivery and charging system, and strengthening users participation.

Chile

In this country the various user sectors increasingly demand larger volumes of water, in a context of scarcity, where particularly surface water resources are almost fully allocated to meet current demand. Thus, at the present time, new demands will have to be met with surface water resources from the southern part of the country and with groundwater.

The main institutional feature is that the Water Agency (independently from all water user sectors) is the sole governmental body in charge of water resources monitoring, research and administration (including issuing of water rights). Another important feature is that once Government grants a water permit, water user organizations distribute and manage the resource with no state intervention.

The Chilean water legislation, effective since 1981, with full constitutional support, establishes solid water rights, which are neither tied to land ownership nor to a specific beneficial and effective water use. Moreover, they may be freely transferred; consequently a water rights market has been established. This legal security on the use rights, water markets and the fact that no water resource charge is levied, have been essential for the development of productive projects; nevertheless, it has increased water waste and made speculation with water rights possible. Since the early 90s significant progress on wastewater discharge identification and control through adequate standards has been achieved, but the "polluter-pays principle" has not been implemented. In 1993 the National Congress started discussing draft amendments to overcome the legal impediments to the water rights system.

Mexico

Water resource management is perhaps Mexico's most urgent environmental problem today, and one that impacts heavily on the economy. The country is slightly less than 2 million km^2 in size and the population has quadrupled from 25 million in 1950, to 100 million today. Population growth has occurred nationwide, but has been greater in the semi-arid and arid north, northwest, and central regions, which are precisely the regions with greater economic activity and where the major water shortage problems occur. Half the volume of abstracted groundwater is pumped from overexploited aquifers. In 1975, 32 of a total of 653 aquifers were considered overdrawn; there were 80 by 1985 and 100 by 2002, accounting for over 50 percent of the country's groundwater supply. In contrast, the southeast has abundant water resources but only 23 percent of the population.

A new water law and regulations came into effect in December 1992 and January 1994, respectively (the day after their publication in the Official Gazette) and provided for only a three-year period to register the estimated 300,000 existing users. This period was insufficient, so in 1995, 1996, 2001 and 2002 the President of the Republic issued decrees to extend it and pardon the arrears of water charges owed by those who applied for water abstraction and wastewater discharge permits. Water legislation provided for 5 to 50-year permit duration. However, according to the 1996 decrees, all applicants were issued 10-year permits. This was deemed to be a short enough duration for the Government to be able to rectify a grant when users ask for permit renewal, but long enough to improve information on water availability (taking into account both quantity and quality) and on water uses, in order to make a decision based on adequate studies.

Thanks to the presidential decrees, mass media campaigns and hundreds of meetings with water users, by mid 2003, most users (330,000) had been granted abstraction permits, which were recorded in the Water Rights Public Register. The fact that all applicants were granted permits without carrying out water balance studies was accepted in 1995 as an "ecological price" for obtaining much needed information that had to be paid because in some of the river basins and aquifers where permits were granted, water is scarce. This "ecological price" would make it possible to register all existing users in order to be able to set the stage for sustainable water resources development and management.

Although that consideration continues being valid and to count on a complete Register constitutes an important asset, it is necessary to recognize that many river basins and aquifers were over-allocated, numerous users declared to be using greater volumes to the real ones (and consequently they obtained their legal permits for such amounts) and due to the high speed of the process during the first years, the Register is not as trustworthy as desirable.

Once concluded the formalization process the National Water Commission has put a greater emphasis in streamlining implementation tools; reinforcing order and control mechanisms; as well as granting new fiscal incentives and adjusting water charges aimed at enforcing users' compliance and increasing revenue. The Commission has also launched some measures to ensure that the water rights administration system effectively becomes a water resource management tool.

Water resource levies, both for abstraction and wastewater disposal were introduced in 1989 with a dual purpose: (a) improving water use efficiency, promoting gradual reallocation to more economically efficient uses and preventing pollution, and (b) providing economic resources for water resource development and management. The tariff structure for water abstraction provides for cross subsidies: industry is charged the highest tariff, municipal water utilities an intermediate tariff and irrigation, which was exempted until 2003, now is charged a very low tariff and only for the abstracted volume exceeding the user's entitlement. This charging scheme, along with incentives such as not charging irrigation when users comply with their entitlement, reinvesting in system improvement the levies paid (plus an equivalent amount provided by Federal Government) by municipalities, and exempting industries from their wastewater disposal levy during the time they build their treatment plant, has resulted generally in positive experiences such as promoting water savings in industry as well as a more water resource – conscious geographic industrial location, and construction of numerous wastewater treatment plants. Additionally, the levy revenue has been quite substantial, remaining above 50% of the Commission's total expenditure (for water resources development and management) isince 1989, with a peak 92% in 1993

In April 2004, the water law was substantially amended: the author is of the opinion that implementation will be even more difficult than it already was with the previous version, due to some un-realistic new provisions, such as the mandate to set up river basin agencies all over the country in only 18 months.

South Africa

South Africa depends mainly on surface water resources for most of its urban, industrial and irrigation requirements. In general, surface water resources are highly developed over most of the country. Groundwater, while also extensively utilized, particularly in the rural and more arid areas, is limited due to the geology of the country, much of which is hard rock. Large porous aquifers occur only in a few areas. In the northern parts of

the country both the surface and groundwater resources are nearly fully developed and utilized. Over-exploitation occurs in some localized areas. The reverse applies to the well-watered south-eastern region of the country where there are still significant undeveloped and little-used resources. (DWAF 2004)

South Africa's water sector reform should be seen as part of the dramatic political change that has taken place in the country since 1994. The main objectives of these reforms are the equitable allocation of water resources. In 1995, the Ministry of Water Affairs and Forestry embarked on a process of reviewing South Africa's existing water law, with the objective of developing a new law that reflects the values of the new Constitution and the limits to the country's water resources.

During the preparation of the fourth draft of the National Water Bill, the experience of other countries in preparing a new law was sought, with the assistance of the FAO. One of the main recommendations was to establish an implementation team with the task of anticipating what implementing the Bill, once it became an Act, would require. The close interaction of the drafting and implementation teams led to the detection of possible implementation problems in early drafts and the preparation of a capacity building program well before enactment.

There are at least two important features of the National Water Act that may facilitate implementation. One is that water use permits will be required only in water stressed areas, thus providing for a realistic and gradual approach to the regulation of water resources abstraction. The other is that the Act empowers the Minister to bring different sections into effect at different times. The latter feature has allowed spending more than one year after enactment to carry out the groundwork required for implementation.

The congruence of implementation with the spirit of the Water Act is remarkable. In effect, the 2003 draft National Water Resource Strategy calls for a realistic phased program to establish Catchment Management and compulsory water use licensing, along with an intensive capacity building program to support both actions. One of the issues that remain open to question is whether the water rights administration system has in fact evolved into a strong water resource management tool able to address the political changes advocated 10 years ago.

Sri Lanka

Economic development, population pressure and growing demands for food production, electric power, and adequate water for domestic, industrial and commercial use and sanitation services are placing increasing pressure on water resources. In addition, current uses of water also include maintenance of carrying capacities for mitigation of impacts from effluent discharges from domestic and industrial pollutants. It also serves as a medium for maintenance of an environment for aquatic biota and reproduction of aquatic species associated with wetlands. Projections for the year 2000 show that expected demand far outstrips supply, particularly in the country's dry zone where most of the irrigation schemes are located. The available water resources have been subjected to competing uses without concern to its equitable distribution among users. There is no incentive for conserving water although many are deprived of basic requirements of water in terms of volume and acceptable quality for different purposes. There have been frequent water shortages arising from climatic changes and inefficient systems adopted in water use, in the light of rising economic, social and environmental demands.

The Water Resources Secretariat was leading the modernization of water resources management in Sri Lanka. The following parallel activities were undertaken: (i) drafting and discussing the National Water Resources Policy and the Water Resources Act; (ii) drafting the Water Resources Regulations; and (iii) drafting a user and applicant manual to analyze the legislation drafts from their viewpoint. This approach has been very useful, because the two-way feedback which has resulted has improved the draft legislation. It has also helped in making a timely assessment of the water authority's capacity building requirements.

The Policy has been approved in early 2000. The Water Resources Secretariat has approved an implementation workplan, which includes "pre-enactment" and "post-enactment" activities. The first group of activities includes preparing a first version of "implementation tools" such as guidelines, procedures, information

systems, user manuals and organizational arrangements. These would be tested and improved by simulating implementation on paper. The process would assist in preparing a realistic capacity building program.

The draft Water Act provides for a gradual approach to implementation. This is an asset, which makes inclusion in the post-enactment activities of pilot testing on a few selected catchments and aquifers possible, thus providing the opportunity for further improving the implementation tools before nation-wide and fully-fledged implementation begins.

Uganda

Unlike its neighboring countries, Uganda is fortunate to possess, in general, an abundance of water resources at the national level. However, very large differences are found in its spatial distribution. Surface water is the main source for a broad range of activities and may be divided into the Upper Nile System; and the remaining river basins of Uganda. The Upper Nile system represents a huge water resource and is the basis for a broad range of development activities. Most competition for water occurs in the drier regions of the north-east and south-west. Groundwater resources are presently used for rural water supplies. Aquifers are comparatively low yielding with a limited areal extent and poor hydraulic characteristics. Pumped irrigation is only limited in very restricted areas. Also groundwater is used on a small scale in industrial activities due to the high costs and low yields of wells and boreholes.

The Water Statute was enacted in 1995, that is, the same year the new Constitution was adopted. Such enactment followed the simple and gradual approach to water resources management advocated by the Ugandan Water Action Plan, which was adopted also in 1995. However, the Water Rights Administration Unit was grossly understaffed and this fact made it impossible for the Unit to establish a fruitful dialogue with the draftspersons in charge of preparing the Water Resources Regulations (WRR) and Wastewater Discharge Regulations (WDR), which were issued in 1998. As a result, some contradictions and loopholes, which make implementation difficult, were found in these regulations. For instance, while the WRR provided for one year for existing users to register, the WDR did not provide for a transition period. Also, the draft effluent standard was unrealistic because it did not take into account the laboratory capacity in the country.

Some legislative provisions were drafted to overcome the problems in the regulations mentioned above, as well as a User and Applicant Manual to make legislation easier to understand. It was also recommended to follow the "blue and red area approach" described in the guidelines below. The Government resorted to some provisions to improve the Water Rights Administration Unit staffing. However, it was deemed necessary to complement this unit by external support. Therefore, the capacity building program, including a twinning approach in order to simultaneously train civil servants and national consulting firms, was proposed.

Uruguay

Generally, water users' needs are presently satisfied. Although so far the use of water has not generated great number of conflicts, demand is rapidly increasing and problems regarding the use of water and wastewater disposal could be faced in the future. The National Hydrological Agency is invested with the sufficient authority to manage the water resources independently of all user sectors, but the fact that each water user sector is handled by a different entity, makes water resources management integration difficult and paperwork cumbersome. Water quality aspects, including the issuing of wastewater discharge permits, are handled by a number of other agencies and water pollution status is not well known.

Water users have complied with the Water Code approved in 1978, mainly because they are aware that Government will protect rights in the Public Water Registry. Nevertheless, the registry still is incomplete, mainly regarding wastewater effluents. Currently, priority issues that require to be regulated, such as aquifer management, are being taken care of. Although the Water Code is generally satisfactory, it requires being improved taking advantage of recent experience and technological progress. One of its main assets is being a frame law leaving details to regulations. Its main weakness is that it recognizes both private and public property of the water resource, thus making legal interpretations that favor private against collective interest possible.

Uruguayan specialists have stated that the main aspects where water legislation should be improved are declaring water resources under public dominion and water use rights under private property, strengthening coordination between governmental units managing water quantity and quality and establishing effective procedures for wastewater discharge permitting and control. In October 31, 2004 a constitutional reform was approved, by which all surface water and groundwater, except rainfall, were declared under public dominion. Also, all water permits issued without taking into account the new National Water Supply and Sanitation Policy (such as sustainable water resource management, stakeholder participation, establishment of water use priorities being drinking water the first one, and water supply and sanitation services to be provided only by public agencies) shall be cancelled

First approach to a set of guidelines

The purpose of these guidelines is to draft "implementable" water legislation, in other words, legislation that can be administered and monitored by the Government and complied with by users. The following guidelines stem from experiences in specific countries, but the essence of such experiences has been distilled in this paper in order to arrive at recommendations that can be generally applied. They are grouped in four sets: (i) guidelines for setting up an enabling environment for implementation, (ii) guidelines for drafting "implementable" water legislation, (iii) guidelines for the implementation itself, (iv) guidelines for addressing plural legislative frameworks through stakeholder participation and (v) guidelines for making water rights administration system true water resources management tool.

Guidelines for Setting Up an Enabling Environment for Implementation

1. *There is no universal rule for water rights administration*. Not every country, or even every region within a country, needs to establish a water rights administration system. It depends on how scarce and polluted water is, how much water is required to address the needs of the poor by developing untapped water resources, or how badly reallocation is required. Furthermore, water legislation and implementation tools must be tailored to the specific history, current social, economic and political circumstances and present institutional capacity of each country.
2. *Perfect is the enemy of good*. Laws, regulations and implementation tools do not have to be perfect, they have to work. The simpler they are the easier it is to implement quality control from the outset.
3. *Water legislation should preferably be flexible*. Being impossible to anticipate all possible situations and design a rule to address it, water legislation should consecrate essential principles and be flexible enough to take care of unforeseen event and enable the administrative authority to make ad-hoc regulations when needed.
4. *Governments should assume both development and regulatory roles, and ensure co-ordination between the corresponding agencies*. Water rights may provide a strong link between water resource management and water development and services such as irrigation and water supply, but government must both (i) fully assume its regulator and developer roles, particularly in developing countries where a large percentage of the population still lacks water services, and (ii) ensure co-ordination mechanisms between development and regulating agencies.
5. *Implementation of water rights administration systems cannot be achieved overnight*. The duration of such a process cannot be measured in months. It must be measured in years and in many cases even in decades. This statement is supported by international experience, which shows that the design and implementation of a water rights administration system is neither a simple process nor can it be achieved overnight. The following examples illustrate this. (i) The process to adjudicate surface water rights in the state of Texas, USA (Wurbs 1995) , through detailed procedures including field inspection and determination of each right, which included the participation of the Judiciary, took twenty years, and it relied on public and private organizations with strong capacity. Furthermore, several universities in the state of Texas supported the process. (ii) In Mexico, Congress approved the law on National Waters in December 1992 and it took until 2000 (eight years) to design the implementation tools as well as receive and register applications for water entitlements and for wastewater discharge permits from existing users and wastewater dischargers, following a simplified, user-friendly approach.
6. *Political support at the highest level in a country is a must for successfully implementing water rights administration systems*. Political support is indispensable since strong economic and political interests are usually affected when allocating or reallocating water resources. The following are arguments that

may help in obtaining such support. (i) The main benefit of such systems is that they are the most important tools for integrated water resources management. (ii) They are useful for assessing water balances in river basins and aquifers; setting up water demand management programs; ensuring water resources availability to address the needs of the poor; offering security to investors through a reliable public water rights registry; establishing water charging systems that would make water resources management self-sufficient; and promoting water rights trading after all existing users have been registered.

Guidelines for Drafting "Implementable" Legislation

7. *The adoption of a water policy* is a good starting point before drafting new water legislation or proposing major amendments to existing legislation. It is advisable to draft or update a water policy paper and generate a thorough public debate on it. The policy should include the rationale for amending existing legislation or for drafting new water legislation as well as an outline of the legislative proposals.
8. *Ownership makes things happen*. Government personnel in charge of administering and monitoring the law as well as users should participate by discussing successive drafts of water legislation and as far as possible, drafts of regulations and implementation tools (guidelines, procedures, information systems, organizational arrangements, and user and applicant manuals).
9. *Regulations and implementation tools should be drafted simultaneously*. If this is done, a productive feedback is established between draftspersons and water rights administrators. Furthermore, it is advisable to go one step further and simultaneously draft all the required implementation tools.
10. *Implementation simulation on paper provides valuable inputs to capacity building programs*. Based on the draft legislation and implementation tools, the entire process for granting water and wastewater discharge permits may be pilot tested in selected river basins and aquifers. If the simulation shows insufficient governmental or user capacity, then the legislation should be redrafted, procedures simplified, and capacity-building stressed.
11. *Carry out feasibility and impact regulatory assessments*. It is advisable to test a draft regulatory framework before actually implementing it. That is, carry out a "Regulatory Feasibility Assessment" (RFA) by assessing if the Government would be able to administer and enforce such framework. It is also advisable to carry out a "Regulatory Impact Assessment" (RIA) by assessing how the regulatory framework would affect different sets of users. For instance, Set A of large industries may have the technical and financial means to comply with certain stringent effluent standards, whereas Set B of smaller industries may require more time and probably less stringent standards. The RFA and the RIA could provide inputs in designing capacity-building programs for the Government, the private sector and organized water users.
12. *Water rights administration requires a fine-tuned balance* of regulatory, economic and participatory instruments. Water legislation that includes the three instruments usually provides a better framework for carrying out the job, but no single instrument is ever enough in itself.
13. *Small poor users must be approached differently.* Thresholds for registration and permitting should be realistic and dynamic. Bureaucratic conditions to use water should not be imposed on users under prescribed thresholds, but Government should establish simple mechanisms to keep track of the estimated volume being used in order to introduce controls and make thresholds more stringent when the sheer number of users threats stressing the resource.
14. *Customary rights should be dealt with comprehensively,* either formally recognized or appropriately compensated.
15. *A realistic transition period* should be considered in the law so as to give existing users enough time to comply with it. Enough time is required in order to implement a user-friendly approach so that the Government works with, not against, users. This would enable the water authority personnel to be perceived by users as knowledgeable and helpful people willing to work hand in hand with them in order to assess their water needs and make realistic assessments of the volumes of water users are in fact utilizing, and not as policemen ready to punish users for not complying with the law.
16. *A two-step approach to appeals is commendable*. If the only channel for appeals is the judiciary, it may be overwhelmed by requests that could easily be handled by the water authority. Therefore, the system for the review of administrative decisions in general permitting, it is advisable that the water legislation provide for the appeal function to be carried out by the water authority itself, in the first instance.

Guidelines for an Implementation Strategy

17. *Beware of amendments!* Taking "imperfect" legislation as an excuse for not implementing it may tempt one to promote amendments before actually testing the legislation in practice (and some times ending with more problems than one had intended to solve). Legal reforms should be attempted only after giving implementation a chance and identifying implementation failures. Furthermore, even then no amendment should be promoted unless one is sure the identified shortcomings could be realistically overcome.
18. *A planning approach makes implementation feasible.* The following planning tools should be developed with whatever information is available, in order to obtain results in a three-month to one-year period.
19. A "users and wastewater dischargers model" is useful in preparing a program for registering existing users and wastewater dischargers. The first approach could be a simple spreadsheet with the number of users and a rough estimate for each one of volume of water which is abstracted and of the volume of wastewater discharged and of polluting loads. When enough information becomes available the model may be improved and more sophisticated software utilized.
20. The "red and blue areas approach". Usually when new water legislation is adopted it is difficult to cope with new applications because all existing users have not been registered yet. This is aggravated by the fact that in many cases, information on water quality and quantity is not reliable enough. Therefore it becomes impossible to compute a water balance or a polluting load balance in order to assess the suitability of granting a new water or wastewater discharge permit in a specific aquifer or river basin. A pragmatic approach for a transition period during which existing users would be registered and water quality and quantity information improved, is to classify river basins and aquifers as follows: (i) "Red areas", where because of pollution, scarcity or conflicts among water users, no more new water abstraction and wastewater discharge permits should be granted; (ii) "Blue areas", where due to the availability of enough water and appropriate conditions of receiving bodies, new developers would be welcome, and permits would be automatically granted up to a certain total abstracted volume or polluting load and; (iii) "Yellow" areas, where a study would be required to make a decision. During the transition period all river basins and aquifers in the country would be classified either as red or blue, with no yellow areas for the time being. However an applicant could be asked to bear the cost of carrying out the required detailed studies. Granting short-duration permits could reduce harm to the environment and not hinder development. When the user asks for permit renewal, a decision would be made based on better information.
21. *Functional integration and/or co-ordination are advisable.* The same organizational unit should issue authorizations for all water users, including abstraction and wastewater discharge, in order to contribute to integrated water resources management. Also, it should bring under one roof technical, administrative and fiscal responsibilities, in order to be self-sufficient, offer timely response to user applications and represent a single interface to the user. If this integration is not possible, strong co-ordination between the agencies involved is mandatory.
22. *Monitoring should be approached realistically.* Monitoring of user compliance with the terms and conditions of their water abstraction and wastewater discharge permits is usually the most difficult component of water rights administration, because of lack of institutional capacity and economic resources. Since it would be impossible to monitor every single user, a feasible alternative would be to select a random sample, according to the existing capacity and thoroughly monitor the users in that sample. Transparency in the process is mandatory in order to ensure fair treatment to all users. When wrongdoing is detected, all the weight of the law should be applied and the cases should be widely publicized using the media. As capacity develops, the sample size can be enlarged.
23. *Information and monitoring technology must fit the country's institutional capacity.* The best available "soft" and "hard" technology should be used, but only to the extent permitted by the available institutional capacity at any point in time. Also, financial and bureaucratic restrictions such as bidding procedures, procurement requirements, and feasibility to carry out sound maintenance and keep in stock enough spare parts, should be taken into account. Capacity- building requirements should be anticipated and acted upon so as to train qualified personnel before the new purchased equipment arrives.
24. *Quality control ensures credibility and facilitates conflict resolution. Right from the outset of implementation, quality control should be established for every step. This co*ntrol should help in assessing whether administrative and technical guidelines and procedures are being properly followed, documents properly filed and decisions made which are respectful of due process requirements. This would result in a user-oriented approach and in making documentation readily available for the disposition of appeals.
25. *Water rights trading is an efficient water allocation tool, but must not be promoted before all water users have been granted a title and registered.* A reliable water rights administration system is the pre-requisite

for a water rights market to develop and take hold, lest one runs the risk of making commercial transactions on inexistent water.

26. *Government must approach differently different groups of users* Large users should carry most of the burden of registration and monitoring of their water use, thus freeing Government's scarce resources to keep track of and support the small rural users.

27. *The most important activity for achieving sustainable implementation is capacity-building.* In developing countries strong and capable governments are required to ensure sustainable water resources management and particularly for running a water rights administration system. Therefore, capacity-building of the civil service, including training and keeping implementation tools simple and updated as well as maintaining an enabling working environment in order to retain capable personnel, is indispensable but not enough. Users' capacity must also be enhanced so they will be able to comply with water legislation.

Guidelines for addressing plural legislative frameworks through stakeholder participation.

The following guidelines (Garduño *et al* 2003) although addressed specifically to the case of groundwater management illustrate the need of including stakeholders. Through their participation customary rules should be taken into account to facilitate different types of rights being valid and efficient.

28. *Stakeholder participation in groundwater management is essential* for the following reasons:
    - management decisions (such as reducing water abstraction rights in an excessively exploited aquifer) taken unilaterally by the regulatory agency without due regard to customary rules and social consensus are often impossible to implement
    - it enables essential management activities (such as monitoring, inspection, and fee collection) to be carried out more effectively and economically through cooperative efforts and shared burdens
    - it facilitates the integration and coordination of decisions relating to groundwater resources, land use and waste management

29. *Government has essential roles to play in participatory groundwater management, such as:*
    - making complex groundwater situations understandable; stakeholders will usually then be willing to consider management interventions and to accept advice to be sure that their own ideas are technically and economically sound
    - empowering stakeholders organizations: a patronizing ('officials know best') attitude should be avoided and it must be recognized that stakeholders must be the main actors in the practical management process (including their customary rules) with the government role being mainly to assist in identifying strategic issues and implementation solutions

Guidelines for making water rights administration systems true water resources management tools.

30. The real challenge is not to make a water rights administration system run smoothly, but to really address with it the water resources management issues which called for its establishment. Notwithstanding the importance of designing and implementing a system that runs well and is efficient, the most important challenge is to insert it into the daily activities and relevant decisions in water resource management. To achieve this, it is advisable to keep asking why was the system established in the first place, and assess regularly whether the established management goals are effectively being achieved (such as reducing excessive groundwater abstraction or improving the quality of water in a river). Otherwise, we may be doing "the thing right, but not necessarily the right thing".

The "parallel track approach"

In drafting water policy, law and regulations, it is not unusual to take one step at a time, namely:

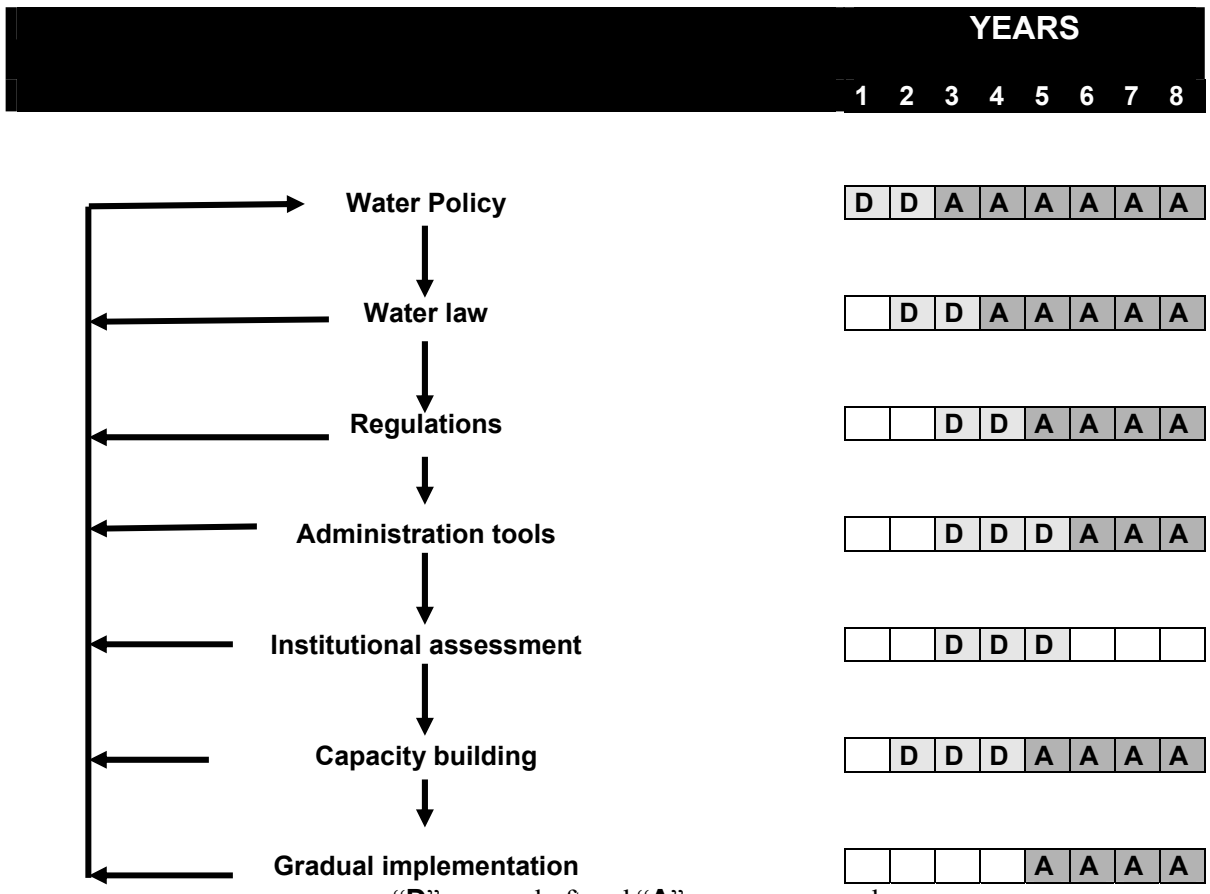
- wait until an official water policy has been drafted, negotiated and approved before producing the first draft water law
- do not even imagine what the regulations will be like before the new water law has been approved and enacted, and so on …

Figure 3 shows firstly we are facing a very lengthy process, which as stated above should be measured in years or probably decades, not in months. Secondly it shows a "parallel track approach", which has the following advantages:

- two-way feedback between drafters and implementers
- assessment of the water authority's capacity to administer and enforce the new legislation, as well as capacity and willingness of the water users to comply with it
- it is cheaper to make mistakes on paper than on the ground
- if a certain goal, regulation or administration tool proves to be unfeasible on paper, they may be modified and/or capacity building programs may be designed and implemented
- once the paperwork has been finished, implementation may proceed on a pilot basis and later cover gradually a whole region or country.

Conclusions

The development of a stable system of water rights has far wider benefits than preventing conflicts among neighboring users, since it provides a sound foundation for the development and protection of water resources and for the conservation of aquatic ecosystems. Also, steps towards more integrated water resources management can only be effectively tackled when water rights have been adequately defined. By the same token, it must be recognized that the administration of such rights should go hand-in-hand with the administration of wastewater disposal permits and of water-resource fees or levies.



"**D**" means draft and "**A**" means approved

Figure 3. The "parallel track approach"

"Implementable" legislation is one that the Government is able to administer and enforce, and water users have the ability to comply with. In the particular case of a water use, the most important actor is the water user/ applicant/license holder. But other users in the same river basin or groundwater aquifer who may be affected by that use also play an important role.

When designing a water rights administration system and setting up a time frame for implementation, it is wise to be aware of the tools that may be required to implement it; otherwise an unrealistic system may result.

The specific conclusions from the summary case studies presented above are:

- In Chile, Argentina (Mendoza) and Uruguay progress in their respective water rights administration systems has gone hand in hand with recent discussions on how to improve their institutional and legal frameworks. By mid 2003, when Garduno *et al* 2003 was edited, the National Congress in Chile was discussing a proposal to amend the Water Code and the Mendoza legislature had received a proposal to transform the Irrigation Department (in effect, the water authority but still with only partial powers) in a fully fledged Water Resources Department. The issue of public versus private ownership of the water resource, was addressed in October 2004 through a constitutional reform promoted by people's direct democracy in Uruguay
- In Mexico the main issue was that water legislation did not provide for enough time to register existing users, and thus the problems caused by an accelerated formalization process. The 2004 amendments to the National Water Law may make implementation even more difficult than it used to be.
- In Uganda, the water regulations which emerged showed some inconsistencies and institutional capacity needed to be strengthened.
- The issue in South Africa was that the first drafts of the National Water Bill did not address implementation needs, but this was overcome by establishing a policy implementation team that worked hand in hand with the drafting team. After six years of coming into effect the challenges for implementation are addressing water equity issues according to the new democratic South Africa's policies with the existing Water Act and alerting which of these issues cannot be solved only through the implementation of water legislation.
- In the case of Sri Lanka, the first draft of the Water Resources Act and of Regulations was written mainly from the Government's perspective, with little regard to the users' needs. Assessing these drafts through the user/applicant perspective introduced a more realistic approach. The Water Policy has been adopted, but the Water Resources Act has not been approved yet.

The overriding conclusions form the proposed guidelines are:

- There is no universal rule for water rights administration. Not every country, or even every region within a country, needs to establish a water rights administration system. It depends on how scarce and polluted water is, how much water is required to address the needs of the poor by developing untapped water resources, or how badly reallocation is required. Furthermore, water legislation and implementation tools must be tailored to the specific history, current social, economic and political circumstances and present institutional capacity of each country.
- The guidelines were developed from experiences in countries with mainly formal water rights systems, but they deal basically with the processes involved in the design and implementation of such systems, and in this respect they could be also useful in making the best of existing informal systems. Customary practices could be taken into account through stakeholder participation within the fold of formal water resource legislation, but governments need to assume their responsibility in mobilizing and sustaining such participation.

Looking into some experiences elsewhere:

- In many African countries (van Koppen, 2004), as in India (Shah 2005), the majority of water users lives in informal agrarian economy and use water without contact with government, therefore imposing a formal water rights systems can be counterproductive and it may be better to enhance existing informal/customary systems. Nevertheless, in many of these countries large commercial agricultural enterprises, industries and large cities merit a formal system in order to provide them with legal certainty on their water rights, but also to protect the rights of the small rural users.

- Large users should carry most of the burden of registration and monitoring of their water use, thus freeing Government's scarce resources to keep track of and support the small rural users; where the number of rural users are unmanageably large, user associations may be registered and individual rights may be managed through customary rules with Government support to establish and sustain such associations..

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Formal law and local water control in the Andean region: a field of fierce contestation

Rutgerd Boelens and Rocio Bustamante

Water access and control rights of peasant and indigenous communities in the Andean countries are under continuous attack. Apart from historical processes of rights encroachment by elites and landlords, currently powerful water actors intervene within communities and territories while often neglecting agreements on local water rights and management rules. Vertical state law and intervention practices, as well as new privatization policies, tend to intensify the problem and generally ignore, discriminate or undermine local normative frameworks. Recognition of and security for the diverse and dynamic local rights and management frameworks is crucial not just for improving rural livelihoods but also for national food security in the Andean countries. The paper outlines the efforts of the action-research, exchange and advocacy program WALIR (Water Law and Indigenous Rights) to address these issues. The water policy and legal context in the Andean region, and some of the key conceptual challenges related to the official recognition of local socio-legal repertoires are briefly discussed. It ends with a reflection on conditions for improving rights recognition of marginalized groups and peasant and indigenous communities, through policy and interactive intervention strategies.

Keywords: Andes, Latin America, irrigation, water law, water rights, positive law, local law

Introduction

For centuries, local and indigenous water rights and rules in the Andean region (including highland parts of Colombia, Venezuela, Ecuador, Peru, Bolivia and Chile) have been largely neglected or discriminated against. Since agriculture for the larger part depends on irrigation within peasant and indigenous water management systems, food security is also compromised. The process of undermining local communities' water access and control rights continues up to today and is not only headed by powerful local, national and international water use actors encroaching local rights; it is also a direct consequence of vertical State law and intervention practices, and the latest privatization policies. However, recognition of and security for the diverse and dynamic local rights and management frameworks is crucial for improving rural livelihoods and even national food security in the Andean countries.

In this paper[1], the challenges of a water rights action-research, exchange and advocacy program are outlined. The program 'Water Law and Indigenous Rights: Towards recognition of local and indigenous rights and management rules in national legislation' (WALIR)[2] aims to contribute to countering the above-mentioned discrimination and injustice. Within a broader international perspective, a central focus of the program is on the Andean region. Therefore, after this introductory section, we address some basic features of the Andean context regarding local water rights, and the water policy and legal arena. In the third section, the action-research program is presented. In the fourth section, we elaborate some of the key conceptual challenges related to the issue of official recognition of local socio-legal repertoires, and question the effectiveness of law-oriented strategies for solving water conflicts and rights issues. In the last section we reflect on some critical issues related to policies for participatory water intervention strategies to sustain local rights systems. The papers intention is not to give definite answers but rather to clarify and illustrate some important questions and dilemmas emerging in the context of the Andean region, and which may have a wider relevance in other regions and continents.

Background on water control in the Andean region

Diversity and legal pluralism in water rights and management

Increasingly academic and policy efforts are trying to understand and reflect upon the socio-legal complexities of local water use and management realities, and the relationship between official water

resources management and the plurality of legal conditions in society (see for example: Benda-Beckmann et al. 1998; Bruns and Meinzen-Dick, 2000; McCay and Jentoft, 1998; Peña, 2004; Roth, 2003; Zwarteveen 1997). Water rights and policy analysis in the Andean region has received similar attention, and a vast body of literature now concentrates on local rights and water management practices (for example: Boelens & Hoogendam, 2002; Bustamante & Vega (forthcoming); Gelles, 2000; Gerbrandy & Hoogendam, 1998; Guillet, 1992; Palacios, 2003; Vera 2004) on the critique of bureaucratic water management, the State legal system and its top-down policies (e.g. Bustamante, 2002; Gelles, 1998; Guevara et al., 2002, 2004; Guillet, 1992; Lynch, 1988; Palacios 2002) and on the problematic impacts of the recent neo-liberal privatization proposals and policies (Bauer 1997, Dourojeanni & Jouravlev 1999; Gentes 2002, 2003; Hendriks 1998, 2004). But notwithstanding the fact that the issue of local water rights 'recognition' may now receive more attention, its conceptual and practical problems are far from resolved and the situation 'in the field' is getting worse every day.

Commonly, legitimate authority in Andean water management is not restricted to only State agencies, nor do legitimate rights and rules refer to only those emanated by State law. Water rights usually exist in conditions of legal pluralism where rules and principles of different origin and legitimization co-exist in the same locality, mutually interacting (Cf. Benda-Beckmann et al. 1998). In order to penetrate deeper into the importance and functioning of water rights, and to better understand the complexity of water management arrangements found in real life situations, it is necessary to analyze water rights as a multi-layered concept (See Benda-Beckmann et al. 1998, Boelens & Doornbos 2001, Roth 2003). Water rights do not refer to water access and use only. The multi-layered character of water rights can be conceptually represented by the 'bundle of rights' concept, involving water use and operational rights as well as management decision-making rights, and showing enormous diversity and divergence from one place to the other (Beccar et al. 2002, Schlager and Ostrom 1992). Different right-holders, therefore, have different rights and powers.

Obviously, local normative systems do not and have never come into being within a social vacuum, nor are they limited to independent development: alongside physical and ecological conditions, their development is interwoven with the past and present history of the cultural, political, economic, technological and institutional foundations of Andean society. They comprise normative frameworks that are locality-specific, displaying enormous variety from one community to the next and from one region to another. In general, these water rights and management norms are the backbone of community systems in the Andes. Local frameworks of rights, obligations and working rules define water distribution, system operation and maintenance, including the basic agreements that define the organizational structure and application of sanctions for infringements (see Box 1).

Box 1. "Uses and Customs" in the Northern Altiplano of Bolivia

Ancoraimes is an *Aymara* municipality in the *Altiplano* region of Bolivia, where the *Turrini Jawira* watershed is situated (4640 m.a.s.l. – 3810 m.a.s.l.). The river flows through the communities (T*urrini Alta, media y baja*) and *Ancoraimes* town until reaching the *Titicaca* lake. Land management in theses communities is still collective but based upon individual (family) holdings and water management constitutes one of the responsibilities of the peasant's union. The rights over the river are linked to the communal territory and the local organization is charged to control that the obligations linked to the usage (initial investment in the infrastructure, work on the maintenance, contribute with money, attend to the meetings, etc.) are fulfilled. However, small water sources as springs and wells are usually considered to be "private" as part of the land being held by families. The water that flows in the river is used mainly for irrigation, watering cattle and small animals, washing, domestic consumption, etc.; but the water of the springs and wells is mostly for domestic use and watering animals. Only the community that is next to the shores of the Titicaca lake has rights for fishing, because they are part of its territorial rights. In the year 2000 this community were part of the mobilizations and blockades organized against the approval of a new Water Law in the country, because according to their perception, it was going to have an affect on their "uses and customs".

Struggles over water rights and benefits therefore involve conflicts about the access to and withdrawal of this extremely powerful resource, as well as about control over its management, and recognition of the respective authorities´ legitimacy. This is a crucial issue in the Andean region (as well as in many other parts of the world), since it is precisely the *authority* of indigenous and peasant organizations that is increasingly being denied, their *water usage rights* that are being cut off, and their *control over decision-making processes* that is being undermined (Boelens 2003).

The erosion of local water rights

Informal local rights systems seem to be on the losing side in an ever more legalistic world (Hoekema 2004) with severe consequences. In most Andean countries, farmer-managed water management and production systems sustain local livelihoods and are the backbone of national food security. Consequently, water access security and the means and authority to manage their water systems are of central importance to peasant and indigenous communities. However, on top of the historically extremely unequal distribution of access to water, indigenous and customary water rights in the Andean countries are increasingly under pressure., Millions of indigenous water users consequently find themselves structurally among the poorest groups of society. They are usually not represented in national and international decision-making water organs.

When indigenous rights and water management practices are *not* simply obstructed by national legislation and intervention policies, positive attention to the subject is negligible. Governments have paid it mere lip service. Most policies and legislation do not take into account the day-to-day realities and specific contexts of indigenous groups. Since the existence and importance of local and indigenous rights regimes is either ignored or poorly recognized by State law, local regulations and solutions in water management tend to be overlooked by official policies and intervention strategies. Moreover, in the Andean countries, the decision-making power of state irrigation institutions is often based on undemocratic principles and unequal representation of local communities.

Strong demographic pressure can lead to the degeneration of natural resources and livelihood systems, and processes of migration, transnationalisation and urbanisation, among others, are leading to profound changes in the agrarian structure. Not infrequently, local water use systems collapse and local forms and cultures of natural resource management are challenged. Newcomers enter the territories of local peasant and indigenous communities, generally claiming a substantive share of existing water resources and often neglecting local rules and agreements. New water policies tend to completely deny the role of local water users, in particular the central role of women in water provision and management. Consequently, women tend to be the ones who suffer the hardest consequences. All this contributes to a situation of increasing inequality, poverty, conflict and ecological destruction.

Box 2. Indigenous groups lose out in the market for water rights in Chile

In 1981, a new water law was enacted in Chile (*Codigo de aguas*) which established a system of market trading in water rights. The law limited collective water rights while emphasising individual ownership, and indigenous communities have subsequently tended to lose access to water. The law benefited the rich, corporate and well-informed (amongst others mining, forestry and energy companies) who have been able to accumulate new water rights. Indigenous groups are located in two main areas of the country. In the northern Andes, powerful mining companies have been able to buy water rights from *Aymara* and *Atacameños* communities who, having effectively sold their future, have in many cases broken down. In the southern Andes, the water rights of indigenous *Mapuche* groups have been affected by expanding plantation forestry and the construction of new large dams. Trying to register their water rights, some communities were told that no further rights could be granted since all the available resources had been allocated. Efforts to restore collective rights are now being made by the State, but at considerable expense to repurchase rights on behalf of indigenous groups.

Adapted from Gentes (2003)

New policies for water management and regulation

As in other parts of the world, new policies for the regulation, intervention and adaptation of water management are being developed in the Andean countries as an answer to 'water crises'. In principle, such policies, which are supposed to encourage decentralization, could be a major step toward strengthening users' organizations by granting them greater decision-making power and security in their water rights, and respecting sufficient autonomy for water management according to their needs and their own potential and solutions in particular contexts. However, in these times of neoliberalisation and State downsizing in the Andean countries, the slogan of participation is often also a facade for the underlying intention to abandon essential public tasks and cut back on public spending in water management (Boelens et al. 2002a). Looking beneath participatory words and promising statements, one must ask whether transfer policies are also a strategy to, with minimal expense and effort, maintain or even strengthen State control over water at the local level.

The negative impacts and lack of functionality in water management policy at the national level with regard to local situations and marginalized groups means that new water policies are heavily contested in the Andean

countries. It is common to see that powerful stakeholders manage to disproportionately influence new regulations and policies, or monopolize water access and control rights. Generally, female water users and indigenous or peasant representatives have been excluded from the negotiation platforms, consciously or not. Also, the effectiveness of top-down ´decentralization´ policies is questioned, especially since this usually involves transfer of tasks but not decision-making powers to lower management levels. Simultaneously, there is the fear that governmental actions to privatize water services and to establish water markets will not be complemented by adequate frameworks or regulatory bodies to protect the collective interests and water rights of local communities (see Box 2). And where new regulations and institutions *have* been implemented recently, they have often been only paperwork, without sufficient backing in terms of realistic strategies, means or capacities for implementation. As a result, virtual or artificial water management bodies have been created. Moreover, these entities can easily supplant local initiatives that aim to co-ordinate efforts among grassroots user organizations and enforce their own water management rules.

As a consequence, apart from the growing claims from indigenous and peasant water management organizations, as well as female water users, for external agencies to invest in and give serious support to their systems, indigenous and peasant groups also demand to take part in the policy-making process. These demands aim to offset their historical exclusion from these political arenas, which has resulted in water policies that are not grounded in an in-depth analysis of real problems and the potentials of the different players in water management. In the last decade, thereby, we see a certain shift from a class-based to class-, gender- and ethnicity-based claims for water access and control rights, especially in countries such as Ecuador and Bolivia (see Box 3). In many regions the traditional struggle for more equal land distribution has been accompanied or replaced by collective claims for more equal water distribution, and for the legitimisation of local authorities and normative frameworks for water management.

Box 3. The power of organisation and numbers

In Ecuador and Bolivia, the countries in South America with the largest indigenous populations, well-organised social movements have been able to be instrumental in national level debates in water reform. In 1996, CONAIE in Ecuador made its own proposal for a new water law based upon a consensus of all membership indigenous and peasant organisations, which included demands on 1) resisting privatisation of water resources and a loss of state control in water allocation, 2) recognition of cultural and social rights, and 3) representation of users, indigenous and peasant organisations within the institutional framework for water management. In 1998, some of these proposals were recognised in constitutional reforms. In Bolivia, indigenous and peasant confederations proposed in 1998 an alternative agenda for water reform to what the then government was offering. This proposal emphasised the social rather than just economic in use of water and community water rights. Following the Cochabamba Water War in April 2000 a new process of water reforms moved towards recognising these concerns and new irrigation bye-laws and drinking water laws in 2004 have started to recognise some of the concerns of indigenous groups.

Adapted from Palacios (2003), Bustamante (2002) and Bustamante and Vega (forthcoming)

Certainly, there have been many attempts to support local water management, both at the level of policy-making and at the level of project intervention. However, due to a lack of understanding of peasants' norms and ways of thinking, the absence of appropriate forms of collaboration and interactive support strategies, and the prevailing power structures, among others, even well-intentioned irrigation, drinking water and watershed management projects have often broken down local normative and technological systems and the peasant and indigenous communities' own ways of organizing around water. In other cases, outside agents, policy-makers and local elites refused to understand these peasant norms, organizational forms and technology, since these local rules and techniques would underscore and legitimize peasants' own authority and local autonomy in establishing the rules of the game. This often runs counter to outside interests.

As a result of the above, the Andean countries are full of examples of the negative organizational and infrastructural impacts of many top-down water programs, and are guided by ineffective or counter-productive water policies and vertical legislative frameworks. Despite the failures of vertical approaches, and notwithstanding the many discussions and the appearance of a tremendous volume of literature on participatory methodologies and approaches, there are very few examples of water management projects in which the objectives and decisions about technical, normative and organizational design and implementation have been based substantially on the involvement, capacities and knowledge of the direct stakeholders – and particularly neglected are the less powerful groups such women, peasants and indigenous water users. Training programs

tend to involve users in the projects of institutions and professionals, rather than involving the latter in the users' projects and reality.

In the Andean countries, the denial of contemporary forms of indigenous water management is also often combined with a glorification of the past. We find a folkloristic attitude towards contemporary indigenous communities. Very common is the use of either romanticized, paternalistic or racist approaches. Policies are oriented towards a non-existing image of 'Indianity', a stereotype; or towards the assimilation and destruction of indigenous water rights systems (Albó 2002, Baud 1997, Boelens et.al., 2004). As a result of the above, many water programs fail to understand the dynamic and plural nature of indigenous rights and management rules (Gerbrandy and Hoogendam 1998, Boelens and Dávila 1998, Guillet 1992, Mitchell and Guillet 1994).

WALIR: an inter-institutional platform for water rights action research and policy debate

Notwithstanding the long tradition of top-down water control policies and official legislation, there appear to be opportunities for customary and indigenous cultures and water rights systems. It can be observed that most Andean countries have accepted international agreements and work towards constitutional recognition of ethnic plurality and multiculturalism (in some cases Ecuador for instance, even '*interculturalidad*'). At a general level 'indigenous rights' are associated with or are considered to be 'human rights'. However, when it comes to materializing such general agreements in practice or in concrete legislative fields, such as water laws and policies, particular local and indigenous forms of water management (especially water *control* rights) tend to be denied, forbidden or undermined (see Box 4 and Bustamante 2002; CONAIE 1996; Gelles and Boelens 2003; Gentes 2002, 2003; Getches 2002; Guevara et al. 2002, 2004; Pacari 1998; Palacios 2002, 2003; Urteaga 1998; Urteaga et al. 2003; WALIR 2002, 2003).

Box 4. Constraints facing indigenous communities in the Andes

- In Peru, the current water law enacted in 1969 does not recognise any specific water rights of peasant and indigenous communities. Attempts to make everybody equal under the term 'users' have eroded the protection of such communities.
- In Chile, neo-liberal inspired privatisation of water resources has led to the decline of collective water management in the northern and southern parts of the country where indigenous groups live and are struggling to retain water rights in competition with powerful corporate interests
- In Bolivia, local groups supported by effective social movements have generally been able to retain water rights. However, a vacuum in laws and institutions at the national level and growing demands for water, place local organizations in continual contestation to maintain water rights. Examples include the recently aborted proposal to export water from southern Bolivia to Chile.
- In Ecuador, since the approval of the 1972 water law, there have been many conflicts to defend indigenous water rights. By demanding detailed and legalistic registration, the law has constrained the dynamics of these water rights.

To help contribute to the resolution of the above mentioned problems of water rights encroachment and lack of recognition of local water control efforts, the WALIR program was formulated. WALIR is an international, inter-institutional endeavour based on action-research, exchange, capacity-building, empowerment and advocacy. This comparative research program builds upon the work of academic researchers and action-researchers in local networks – both indigenous and non-indigenous. It attempts to be a kind of think-tank to critically inform debates on indigenous and customary rights in water legislation and water policy, both to facilitate local action platforms and to influence circles of law- and policy-making. Equitable rights distribution and democratic decision-making and therefore, support for empowerment of discriminated and oppressed sectors, are the major concerns.

In co-ordination and collaboration with existing networks and counterpart-initiatives, WALIR sets out to analyze water rights and customary management modes of indigenous and peasant communities, comparing them with the contents of current national legislation and policy. Thereby, it sheds light on how the first are legally and materially discriminated against and destructed. The aim is to contribute to a process of change that

structurally recognizes indigenous and customary water management rules and rights in national legislation. It also aims to make a concrete contribution to the implementation of better water management policies. As part of its strategy, WALIR plans to contribute to and present concepts, methodologies and contextual proposals and to sensitize decision-makers regarding the changes needed for appropriate legislation and water policies.

The program, therefore, is not just academic but also action-based. While especially the indigenous populations are being confronted with increasing water scarcity and a traditionally strong neglect of their water management rules and rights, the current political climate seems to be changing for the better. However, actual legal changes are still empty of contents, and there is a lack of clear research results and proposals in this area. The program aims to help bridge these gaps, facing the challenge to take into account the dynamics of customary and indigenous rules, without falling into the trap of decontextualizing and 'freezing' such local normative systems. Fundamentally, the WALIR program is directed towards activities and conclusions that facilitate local, national and international platforms and networks of grassroots organizations and policymakers. But the practical and conceptual pitfalls of rights analysis and recognition initiatives are manifold.

Local and positive law: a difficult relationship

Some conceptual challenges of recognition efforts

In order to confront processes of discrimination, subordination and exclusion, local groups often aim for political action with clear, collective, and unified objectives and answers. However, the struggle for formal and legal recognition poses enormous conceptual problems and challenges with important social and strategic consequences. The notion of 'recognition' in contexts of legal pluralism is, by definition, many-faceted and generally ambiguous.

- First of all, recognition of legal pluralism in the analytical sense refers to the theoretical possibility for there to be more than one single normative framework or legal repertoire in one and the same socio-political setting – multiple normative frameworks that interact with each other. It does not establish any moral or juridical hierarchy among the different existing repertoires ("What there might be according to analytical reasoning").
- On a second level, it refers to the empirical existence of normative plurality in a given, particular society, with its concrete social relationships: the analytical recognition or confirmation on an empirical basis – 'what there is' ("What is observed and recognized scientifically in a particular case").
- On a third level, it refers to political, administrative and juridical recognition, generally by the state and its legal framework, that there are multiple legal systems within one single concrete society ("What is legally recognized by the state").
- On a fourth level, the notion of 'recognition of legal pluralism' may be and often is defined as 'what should be'. Here, the issue in question is recognition of the existing normative plurality in a given society according to the political ideology of the observer. For example, it is common to hear in the Andes (with legal plurality in the sense of levels 1 and 2) that "the state does not recognize indigenous normative frameworks or legal plurality", whereas that same state may have institutionalized legal hierarchies and linkages among the country's different socio-legal repertoires (level 3). The political observer and strategist-activist will sometimes reject such 'subordinating' recognition, since it does not fit in with his or her own outlook.

More generally, we can distinguish, then, between the analytical use of the concept (levels 1 and 2) and the juridical-administrative and political-strategic uses (levels 3 and 4). "In an analytical sense, legal pluralistic thinking does not establish a hierarchy (based on the supposedly higher moral values or degrees of legitimacy, effectiveness or appropriateness of a legal framework) among the multiple existing legal frameworks or repertoires. In political terms, however, it is important to recognize that in most countries the existing, official legal structure is fundamentally hierarchical and consequently, in many fields state law may constitute a source of great social power – a fact that does not deny the political power that local socio-legal repertoires may have. Recognizing the existence of this political hierarchy and the emerging properties of state law in particular contexts offers the possibility to devise tools and strategies for social struggle and progressive change. In the discussion about 'recognition' as a way of giving legal pluralism a place in policy-related issues, both the political-strategic and analytical-academic aspects of recognition combine"

(Boelens, Roth and Zwarteveen 2002). See also Benda-Beckmann 1996; Stavenhagen, Rodolfo & Diego Iturralde, eds. 1990; Stavenhagen, Rodolfo 1994.

Collective and unified claims indeed are interesting for grassroots and indigenous movements, but many questions arise in the debates and struggles for 'water rules and rights recognition', for example (Boelens, 2003):

- Do indigenous peoples and their advocates claim recognition of just 'indigenous rights' (with all the conceptual and political-strategic dilemmas of the 'indigenous' concept), or do they also struggle for recognition of the broader repertoires of 'customary' and 'peasant' rights prevailing in the Andes? And what precisely is the difference in concrete empirical cases?
- There are no clear-cut, indigenous socio-legal frameworks, but many dynamic, interacting and overlapping socio-legal repertoires: should indigenous peoples or local water management organizations try to present and legalize *delimited frameworks* of own water rights, rules and regulations? Or should they rather claim the recognition of their water control rights and thereby the *autonomy to develop* those rules, without the need to detail and specify these rules, rights and principles within the official legal framework?
- Or would it be a more appropriate and effective strategy to claim and defend legalization of their water *access rights* – since these are increasingly being taken away from them - and assume that water management and control rights will follow once the material resource basis has been secured?
- Do recognition efforts only focus on the legal recognition of explicit and/or locally formalized indigenous property structures and water rights ('reference rights', often, but not always, written down), or do and should they also consider the complex, dynamic functioning of local laws and rights in day-to-day practice? These 'rights in action' and ´materialized rights´ emerge in actual social relationships and inform actual human behaviour, but are less 'tangible'.
- How to define and delimit the domain of validity of so-called indigenous rights systems, considering the multi-ethnic compositions of most Andean regions and the dynamic properties of local normative frameworks? In terms of exclusive geographical areas, traditional territories, or flexible culture and livelihood domains?
- How to avoid assimilation and subsequent marginalization of local rights frameworks when these are legally recognized? And how to avoid a situation in which only those 'customary' or 'indigenous' principles that fit into State legislation are recognized by the law, and the complex variety of 'disobedient rules' are silenced after legal recognition?
- Indigenous socio-legal repertoires only make sense in their own, dynamic and particular context, while national laws demand stability and continuity: how to avoid 'freezing' of customary and indigenous rights systems in static and universalistic national legislation in which local principles lose their identity and capacity for renewal, making them useless?
- 'Enabling' and 'flexible' legislation might solve the above problem. However, enabling legislation and flexible rights and rules often lack the power to actually defend local and indigenous rights in conflicts with third parties. How to give room and flexibility to diverse local water rights and management systems, while not weakening their position in conflicts with powerful exogenous interest groups?
- And what does such legal flexibility mean for 'internal' inequalities or abuses of power? If, according to the above dilemmas, autonomy of local rule development and enforcement is claimed for (instead of strategies that aim to legalize concrete, delimited sets of indigenous rights and regulations), how to face the existing gender, class and ethnic injustices which also form part of customary and indigenous socio-legal frameworks and practices?

There are no easy and uniform answers to these questions, and analysis and responses must necessarily be contextual and contextualized. A fundamental dilemma of 'recognition' relates to the fact that positive state law by definition is oriented towards generality, where local law addresses particular cases and issues. Often, the two are at odds.

A closely related dilemma involves the effectiveness of legal recognition strategies. Considering peasant and indigenous communities' lack of access to State law and administration, this question comes prominently to the fore: is *legal* recognition indeed the most effective strategy, or would it be better and more effective for

peasant and indigenous communities to defend their own water laws and rights 'in the field'? (see Box 5 for examples)

Box 5. Defending water rights 'in the field'

- In the Ecuadorian Andes, when the Guargualla irrigation system (Chimborazo province) was being built, the Ceceles zone was arbitrarily excluded from the project area. In 1990, the people of Ceceles began their struggle in order to be included in the project and at times they threatened the government to dynamite the system if their needs were not addressed. In 1994, the efforts of the Ceceles people were successful, their zone was finally included in the allocation and distribution of the system after years of intense struggle.
- In Peru, the community of Cabanaconde successfully managed to gain water rights as part of a new irrigation project that passed through their community without providing enough water for them, through a combination of direct action to open a new intake and press releases to differentiate their activities from 'terrorists'. The community collectively faced down police and authorities, arguing their legitimate needs for water.
- The "Water War" in Bolivia (2000), forced the government to suspend the concession contract granted to an international consortium in the city of Cochabamba and to modify much of the recently approved Drinking and Sanitation Service Law. The conflict opened up, and made more participatory, the legal reform process in the water sector.

Adapted from Boelens and Doornbos (2001) and Gelles (2000)

It is not a dichotomous choice, however. Access to state law indeed is limited, but state law cannot be neglected since it certainly has important influence on (the lack of) local opportunities for local water management forms. It is because of this that indigenous and grassroots organizations in the Andean region have fiercely engaged in the legal battle. In this regard it is important to consider here that efforts to gain legal recognition do not *replace* but rather *complement* local struggles 'in-the-field'. On both levels there is political-strategic action to defend water access rights, define water control rights, legitimize local authority and confront powerful discourses.

New directions in the recognition of diversity

As we have mentioned above, during the last decade, there has been a major change in the laws of most Andean countries. In Colombia, Peru, Bolivia, and Ecuador, the constitutions now formally recognize cultural diversity and legal pluralism. These constitutions grant legal validity, to different degrees and in varying breadth, to the indigenous peoples' own jurisdiction, to peasant and indigenous communities' own norms and authorities, and to self-governance within their own territory (cf. Guevara et al. 2002, Palacios 2002). But it is too early to analyze the true direction and depth of penetration of the latest processes of legislative changes. In civil society and among indigenous and peasant groups, such changes have often failed to materialize (Yrigoyen 1998). Communities of irrigators have often been unable to take advantage of the opportunities for self-governance offered by the new constitution's concept of a pluri-cultural, multi-ethnic state. Another key aspect is that constitutional changes have not yet produced changes in developing the laws and regulations that will enable implementation (Assies et al. 1998).

As for our thematic interest in water management, commonly, changes regarding recognition of diversity are not reflected either in the 'powerful' water laws or agrarian laws (Boelens et al 2004). Despite the great importance of the many ways of managing water for local economies and societies, they are still denied. In Bolivia, version 32 of the proposal for a new water law is being discussed (Box 6 and Bustamante 2002).

In Peru, in a similar way, enacting a water law that would respect peasant and indigenous rights and the country's diversity is far from reality. In Chile, the hegemonic sectors with monopolistic water rights have managed to prevent any legal change that would increase social justice, environmental balance and political democracy. In Ecuador, the indigenous movements' federation Confederation of Indigenous Nationalities of Ecuador (CONAIE) , the main representative of the country's millions of indigenous families led a process to formulate a proposal for a new water law, recognizing Ecuador's diversity in peoples, regions and water management institutions (CONAIE 1996). However, resistance by powerful sectors against legal amendments recognizing diversity and actual implementation of more participatory policies is fierce.

Box 6. The legal reform process in Bolivia

Since the 1970's there were many attempts, mainly promoted by international agencies, to change the outdated Water Law (1906) in Bolivia. By 2000 the Parliament started to discuss proposal number 32, but after the conflicts generated in September and October of that year by privatisation of the water company in Cochabamba, the government signed an agreement to stop the process of legal reform in the water sector. However, because of the need to secure investments in drinking water systems, irrigation and hydroelectricity, a participatory process to elaborate new norms was started. This was initiated with the debates about the drinking water bylaws (2001 and 2004) and continued with the irrigation bylaw (approved in May 2004). Likewise, the Inter Institutional Water Council (CONIAG) was created in 2002, and has as its members representatives from the government, social organizations (indigenous, peasants, irrigators, etc.), public universities, and private companies. Its mandate is to promote a process to design a water policy and legislation for the country in a more participatory way.

This last point seems to be key: to what degree do legal changes for 'recognition' and implementation thereof in society have the necessary political and social support? How can these new provisions be reproduced beyond the constitution, in 'strong' legislation (e.g. water law), and in public administration and procedures, and daily water management practice? And to what degree are new legal changes actually responsive to demands for greater local autonomy and self-governance in water management?

Reflections

Critical and balanced support to local water rights systems still faces many obstacles, and remains a challenge. Below we summarise some crucial issues to be tackled relating to the field of water policies for interactive, jointly-devised intervention and support efforts. Legal change is empty without matching change in the way water development and support to local normative frameworks is given shape in the field, in diverse particular contexts. Comparing water management policies and actual intervention projects, we have observed the wide divergence between the discourse on people's participation and actual practice. Reasons have to do with: the adverse socio-political context; unavailability of time and the need for short-term, tangible results; rigid institutional and budgetary planning by donors; and in some cases, users' groups' lack of basic experience with water management. A further key factor is the lack of adequate methods and methodologies and the single-discipline, vertical training of both technical experts and social organizers and action-researchers. Consequently, although an increasing number of exceptions exist, most institutions have not usually been able to adequately address the strong demand of water user communities for interactive support to their use and management systems. Fundamentally, interactive water system or platform support is about the sharing of power – power based on knowledge, economic standing, or social and psychological status. Sharing that power to make and implement decisions goes against the grain of many vested interests.

The same goes for legislative and policy frameworks. While existing policies in the Andean countries are often obsolete, the mono-disciplinary training of young water professionals and future policy-makers makes it even more difficult to work on creative, multi-sector and interdisciplinary solutions and proposals. Issues like legal pluralism in Andean water user communities, and the interaction between socio-legal, technical and organizational domains of water management, make an interdisciplinary focus essential when working on new policy proposals. Although specialization is important, no artificial separation can be made among the disciplines (hydraulics, agronomy, sociology, law, economics) or among the fundamental issues and elements of water management. They are directly inter-related and interact: changes in one water use and management domain directly influence the other domains and the overall system. This conclusion goes beyond so-called multi-disciplinarity. For example, 'dynamic rights reflected in hydraulic works' and 'technologies to materialize water rights' must become subjects for the work of legal and sociological professionals as well as irrigation engineers and technicians. But current practice is far from generally realizing that such a perspective and this remains an important bottleneck and an urgent challenge.

A next crucial point is the fact that development of water use systems and the emergence of management platforms is not a linear process of planning and implementation with pre-calculable, predictable outcomes. Interventions in irrigation, for example, whether 'social' or 'technical', always influence water rights, modify power relationships and gender relationships, and change resource distribution. These relations cannot be planned with organizational prescriptions or by technical and economic formulas. This does not, however,

lend itself to paternalistic aid or an abandonment of planning; it calls for building dynamic strategies, jointly devised with users, including those with the least negotiation power.

In the same way, as a next example, pluralism in systems of rights and authorities simultaneously present in Andean basins cannot be denied by official decrees, the imposition of a single positive normative system, or regulation by the market. This may seem quite appealing to legislators, politicians, intervening projects and outside authorities, but it will never resolve the underlying conflicts. The search for dynamic platforms from which to negotiate, and taking these divergences as starting-points, would seem to offer better opportunities.

Obviously, understanding and facilitating such processes is a complex issue. It requires knowing about local norms, power relations and water use interests. It also requires tact and skill in discussions among the different groups, from users to policy-makers, as well as creativity and professional expertise to prepare and present constructive proposals.

At the local level, organization-building and generation of greater sustainability and social justice in water management, through equitable rules and concrete practices known to all, go hand-in-hand with self-respect, identity, capacity, power and collective action. Not just in general terms, but with specific challenges, consequences and strategies for the field of water management. One of the greatest challenges is to generate creative, pro-active capacity for water management through and within local water organizations: capacity for analysis and (counter) proposals. These activities should materialize at the local level (within and among households, and communities), but also spread to broader arenas. Farther-reaching alliances and networks are indispensable in order to join complementary capacities and forces, to resist imposed norms and to influence both rule-making and rule-implementation, as well as their water access results. Users' alliances do not necessarily consist of peasants or indigenous irrigators only. They can be based on organizational forms integrating multiple interest groups and larger territories, such as entire watersheds, in order to defend local interests, build consensus on rights and co-ordinate activities involving the many different sectors and uses of water.

Conclusion

At the policy level, capacity for critical and interdisciplinary analysis and constructive proposals for change are crucial. Water management development is a socio-political process in which different interest groups meet, face off and negotiate, to include their ideas and interests in organizational, technical and normative designs. These interests are about increasing control over water resources themselves, over decision-making power in system management, over the redistribution of productive resources and/or over the behaviour of the users' group in general. Thus, the *sine qua non* prerequisite, and at the same time the great challenge, is for such negotiation platforms, at the local, regional and national level, to give groups with less social, economic and political power the right to speak up and to vote, to become real co-managers of the water resources, and to avoid the hegemonic rule of dominant groups and institutions. To find the starting-points for strengthening water organizations and platforms, it is fundamental to understand the dynamics of local water management and of peasant and indigenous normative systems, the fundamental motives and mindsets of collective action, the way they are embedded in power and gender relationships, and the creation and reproduction of very specific organizational forms and local identities. A prerequisite for such understanding is to analyze the interaction of local water management with other social, political, technological and normative frameworks and with the different institutions that make up the institutional context in every case.

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Notes

[1] The paper is largely based on the documents "Local Rights and Legal Recognition" by Boelens (2003), and "Water Rights and Watersheds" by Boelens et al. (2002), and Bustamante (2002).

[2] In its initial phase, WALIR has set up an inter-institutional network of institutions, scholars and practitioners of various disciplines and backgrounds, involved in and committed to the above objectives. Preparatory studies conducted so far have focused on current legislation and legal attention to, or neglect and discrimination of, indigenous and customary water rights. The project aims to have an effect beyond this Andean focus, by providing an example and tool for similar action research to be pursued in other regions. Second phase studies of WALIR focus on indigenous water rights in international law and treaties, indigenous identity and water rights, current indigenous water management systems, field case studies, and thematic, complementary research projects (on the relation between "WALIR" and gender, food security, land rights, water policy dialogue methods, among others). Short comparative studies in other countries further complement and strengthen the project and its thematic networks, and lay the foundation for a broader international framework. Next, a number of exchange, dissemination, capacity-building and advocacy activities are implemented, in close collaboration with local, national and international platforms and networks.

International workshop on '*African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa*', 26-28 January 2005, Johannesburg, South Africa

A step by step guide to scale up Community Driven Development

Hans P. Binswanger and Tuu-Van Nguyen

This paper synthesizes the experiences of the authors and other practitioners on how to scale up Community Driven Development (CDD) programs into national CDD programs. The objective of the paper is to assist the reader by providing a step-by-step approach to designing and planning the scale-up of multi-sectoral CDD initiatives. It focuses in particular on the program development phase, in which a program is scaled up to first cover one (or a few) district in its entirety, so that all villages and urban neighborhoods (i.e., all "communities") have access to the program.

Keywords: World Bank, scaling up, community-driven development

Introduction

This paper synthesizes the experiences of the authors and other practitioners on how to scale up Community Driven Development (CDD) programs into national CDD programs. It incorporates the lessons from two global research programs led by the principal author and over a decade and a half of program design and implementation experience. The first research program entitled "Decentralization, Fiscal systems and Rural Development" was carried out between 1993 and 1997 and covered 20 countries. The second research program entitled "Scaling Up of Community Driven Development" was carried out from 2001 to 2004 and covered CDD up scaling experiences in 7 countries. In line with the Africa Region CDD Vision of the World Bank, CDD programs are seen as local development programs consisting of the five following pillars: (i) empowering communities; (ii) empowering local governments; (iii) realigning the center; (iv) improving accountability; and (v) building capacity.

The paper is specifically addressed to program designers and implementers who are looking for practical ways to scale up. It assumes that the reader is well-versed with the principles and application of CDD and already has some experience with CDD programs. It therefore does not question the usefulness of CDD itself, question or evaluate its possible impacts, or present evidence on the usefulness of specific recommended approaches or design tools.

The paper looks only at multisectoral CDD programs for the production of public or semi-public infrastructure services, which are produced by communities with the help of local governments, NGOs, and private sector actors. It does not look at single-sector CDD programs or programs directed solely at empowerment of individual groups through private sector initiatives such as private entrepreneurship programs.

The objective of the paper is to assist the reader by providing a step-by-step approach to designing and planning the scale-up of multi-sectoral CDD initiatives. It focuses in particular on the program development phase, in which a program is scaled up to first cover one (or a few) district in its entirety, so that all villages and urban neighborhoods (i.e., all "communities") have access to the program. In the context of multisectoral programs, communities are usually defined as groups of people with a common residence.[1]

The paper does not present a straightjacket approach. Given the varying governance structures, capacities, and social, economic, political and historical specificities of each country, scaling up and program design must be tailor-made. Therefore, the paper usually presents several options from which to select those most appropriate for the specific country context. Each section of the paper presents key guidelines and/or a menu of options, tools and design elements to address a specific goal.

Moreover, the paper provides in the Annex a comprehensive menu of 68 tools and design elements, which have been found essential or helpful to scaling up by the research teams involved in the Scaling Up CDD Action Research Program. Program design teams can use these lists to enrich the set of options they build

into their program design or to diagnose problems encountered during implementation. The tools and design elements are classified in twelve broad categories: phasing and sequencing; decentralization and local government empowerment; participation and social inclusion; community setup; funding arrangements for the community; institutional setup and program management; training; facilitation; information, education and communication; monitoring and evaluation; community and local government projects; and NGO/Donor harmonization.

The paper begins with a recapitulation of the vision and principles of CDD and its various elements. It then explores the minimum pre-conditions for scaling up, and explains how to kick start the program development phase. The following three sections provide detailed guidance on key considerations to take into account when implementing the program development phase. These include: actors, functions and responsibilities; training, facilitation and participatory planning; and resource flows, resource allocation, and accountability mechanisms. The final two sections explore the scaling up and consolidation phases.

The Vision

Prosperity through local empowerment

CDD is a major component of the broad empowerment agenda pursued by the World Bank and other development partners.[2] Specifically, CDD seeks to put local governments and rural and urban communities in the driver's seat, and give them a new set of powers, rights and obligations. These include:

- the right to be treated as people with capabilities, not objects of pity;
- the power to plan, implement and maintain projects to serve their felt-needs;
- the right to hold politicians and officials accountable;
- the power to command local bureaucrats instead of being supplicants;
- the power to hire, pay and discipline those who provide frontline services;
- the right to a share of central government revenue;
- the power to levy user charges and local taxes;
- the obligation to enable women, ethnic minorities, the poorest and other excluded groups to participate in economic development;
- the obligation to be accountable to local people, not just central governments or donors.

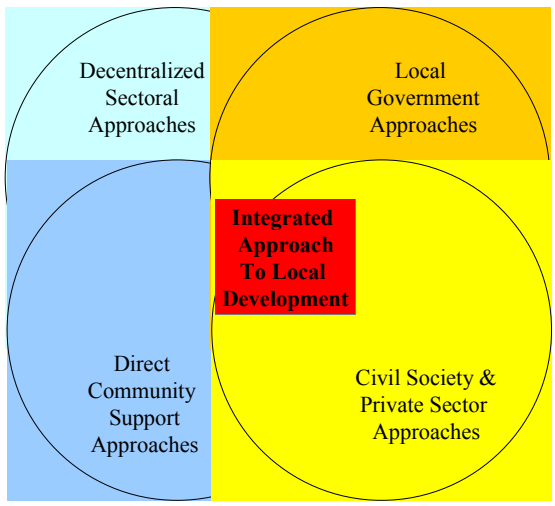

Figure 1. An Integrated Approach to Local Development

Four alternative approaches to local development—decentralized sectoral, local government, civil society/private sector development, and direct community support approaches— that have emerged over the years have come to share the same principles and objectives of local empowerment, beneficiary demand, administrative autonomy, greater downward accountability, and enhanced local capacity. [3] Despite their

similarities, these approaches have not always ensured adequate coordination and integration of their efforts with broader public sector governance and service provision. This has been in great part due to the lack of a unifying conceptual framework, institutional rigidity, and inadequate coordination among line agencies and program implementers.[4]

To overcome these difficulties, close coordination and mutual support is needed on the one hand between communities, civil society and local governments to achieve synergies at the local level, and, on the other, between these three and the policies and structures of the sectors and central Ministries that serve to support (rather than manage) local development efforts. Preferably, initiatives should function within a common budget framework and a simple and flexible Local Development Plan.

Five components

CDD contains five main components: (i) Empowering communities, (ii) Empowering local governments, (iii) Re-aligning the center, (iv) Improving accountability and (v) Building capacity:

Empowering communities
Communities can be organized quickly and productively to diagnose local problems, come up with solutions, lay down priorities, elaborate action plans, and strengthen community organizations and accountability. However, participatory processes will be discredited and atrophy unless communities are empowered with resources and authority. Communities will be truly empowered only if they get untied grants, which enable them to decide their own priorities and hone their decision-making skills.

Empowering local governments
Community empowerment is unsustainable if based on donor-driven program funds. It needs to be embedded in a new or revitalized institutional framework of local government. Administrative and fiscal decentralization must keep pace with political decentralization. Central government staff for frontline services may need to be transferred to lower levels of government. Ultimately, each level of government should also have the administrative machinery to collect local taxes and user charges. The greater the share of local revenue, the more productive local spending is likely to be. Local governments must be assured a constant share of central revenue. In addition, the central government may give earmarked grants for areas which may be neglected by local governments such as combating HIV/AIDS, environmental damage and social exclusion.

Reforming the center
Responding to the needs of the local levels will mean that management and control processes are refashioned to support arms-length relationships between multiple centers of power. Reformers will come up against fears and resistance from civil servants and other powerful groups who believe they will lose from the change. The reform program needs to send the message that decentralization does not mean the withering away of the Center but instead implies a joint venture between different levels of government, each contributing on the basis of its comparative advantage based on the principle of subsidiarity, under which functions are performed at the lowest level effectively carry them out.

Improving accountability
Accountability has traditionally been upwards towards governments and donors. However, the success of a community driven program also depends in large part on downward accountability to users of frontline services and horizontal accountability within communities. Improving accountability therefore involves giving voice to beneficiaries so that service providers, local governments, and central governments may respond to the needs of the local level.

Moreover, as giving voice to local people will enhance participation, greater participation in all projects and programs will improve the voice of local people. Decentralization must hence go all the way to the grassroots. In order to achieve this transparency and responsiveness, CDD should be coordinated by the lowest level of local governments which usually covers no more than a few tens of thousands of people, and where the development actors know both the problems of the local government area as well as each others. Monitoring and evaluation must be a highly participatory process both at the community and local government level.

Developing capacity
Capacity development involves mobilization of latent capacities, facilitation, learning by doing, demand and supply driven training, and technical support. Untied matching grants to communities will help develop their latent capacity for problem solving through learning by doing. Local governments will also develop skills initially through learning by doing, and later through technical assistance. To support this structure, the central government would consequently upgrade its skills for designing, facilitating and supervising large programs, for training local governments and communities, and more broadly for taking on its "white collar" planning, facilitation and regulatory roles.

Principles of Scaling Up CDD

Three principles of scaling up CDD are:

- *Cost effectiveness and fiscal sustainability:* Research shows that this is best achieved by using and further developing existing local institutions, capacities, and people for program management and training; avoiding intermediaries; transferring resources directly to each of the implementing agents and levels; and relying and/or developing community-level technical assistants, such as community health, veterinary or agricultural workers.
- *Co-production of services and infrastructure by different actors and levels:* Scaling up CDD implies the co-production of investments, outputs and services by many different stakeholders at many different levels. Incompatible incentives, differences in values and experience, and the unclear assignment of functions to different co-producers often pose difficulties and impede the development process. Overcoming co-production problems requires (a) fostering a common culture and vision among stakeholders; (b) assigning and describing all program functions unambiguously to different participants based on the principle of subsidiarity; and (c) providing incentives compatible with program objectives.
- *Equal access to information, participation, and democratic decision-making:* Public choice will lead to welfare-enhancing outcomes if all stakeholders have equal access to information and to the decision making process. [5] While this ideal is rarely fulfilled and always under threat, program design and implementation must constantly strive to achieve it. Scaling up therefore requires careful attention to the information gathering and decision making processes at the community and local level, and beyond, as well as a well-designed communications program which can constantly keep all these levels and stakeholders informed. Information, education, and communication (IEC) activities have to meet awareness and learning needs, as also process monitoring needs.

Ensuring minimum conditions

A multisectoral CDD program cannot successfully scale up unless the country meets a certain number of pre-conditions. These include: strong political commitment to local empowerment and decentralization; a well-designed decentralization program geared towards local empowerment; one or several successful and cost-effective community and local government projects; and government and donor willingness to work towards unified disbursement mechanisms. It is therefore important that these elements are already in place or are being put in place at the start of the program.

Strong political commitment

Strong political commitment to local empowerment and to decentralization is vital to scaling up. In many countries, however, the political and social institutions are not conducive, if not directly opposed, to shifting power to the grassroots. Governments are often reluctant to let go of their traditional roles on the basis that they have a comparative advantage in the supply of public works and services, that local empowerment may threaten the current political balance, and that communities will never be able to learn to manage their own projects and resources.

Ways in which the design team can address these issues and start shifting political opinion in favor of local empowerment include:

- *Showcase the successes of CDD and local development*. In most countries, there are already well-documented successful CDD or Local Development approaches which can convince even tough skeptics that empowered communities and local governments can effectively plan, contract, construct, operate and maintain their own projects and services, and manage their own budgets. Where they do not exist, tours by key decision-makers to successful programs outside the country and additional pilots in the country

can fill the gap. Indeed, a major indicator of success in Brazil's North East Rural Development Program and India's Kerala Water Supply Program was the political success of local and regional leaders who had endorsed the approach. Showcases therefore also give rise to local and regional CDD champions who can become instrumental in shifting the political tide.

- *Information campaigns* can sensitize both the general public and government alike. Disseminating the successes of various local empowerment programs through free media (i.e. television and radio) or community radio can generate public demand and pressure, while holding stakeholder fora can confront authorities with the demands and concerns of their beneficiaries. Open communication and regular dialogue can help build confidence, trust and a common vision between a government and its public.

Decentralized structures

A central premise of CDD is that decentralization is the key to scaling up and sustainably fostering participation and resource transfers to communities. While scaling up can begin without waiting for a fully decentralized structure, political, fiscal and administrative decentralization[6] should preferably have begun at program launch, and, if possible, supported by a capacity development program:

- *Willingness to reform the intergovernmental fiscal system*, including transfers and local revenue generation, can ensure that local governments in time receive resources commensurate with their increased responsibilities. In Indonesia, for instance, in light of the tremendous progress of the first two phases of KDP and the growing management needs of their districts, the government recently decided to issue forth new decentralization laws that give the districts control over 40 percent of public spending, and require them to regulate village government to promote village autonomy and empowerment.
- *An existing local government structure, or fairly well defined plans for future local government structure* can provide the basis for local governance planning. In the CDD programs in Mali, Burkina Faso, and Madagascar, and in South Africa's new municipalities, the local government structures allow funds and technical assistance to be routed to communities directly through local governments.
- *The sectors are working on their decentralization visions and plans*. A multi-sector CDD program involves many, if not most sectors of government and the economy. To ensure technical excellence in each of the sectors, while at the same time responding to the needs of the local levels, will require a coordinated effort between local governments and the many sector-specific management and supervision processes. This can only be achieved if sectoral staff, resources and responsibilities are assigned directly to local government offices. In the meantime, deconcentration can be a useful first step to provide some administrative resources to the grassroots level. However, individual deconcentrated sectoral offices will in the long run pose a burden on coordination and management processes, and thus should only be seen as a temporary expedient.

Building on earlier community and/or local government empowerment efforts

Earlier successful and cost-effective community and local government programs or pilots aimed at local development or decentralization such as a Social Fund or local development funds of the United Nations Capital Development Fund (UNCDF), can act as a springboard for the emerging program. Such programs provide readily made structures and processes and a wealth of experience, which can be built upon or coordinated with. Such programs can furthermore be used as demonstration programs. In Mexico, for example, the success of the first Decentralization and Regional Development (DRD I) Program was in large part due to the facts that (i) its design was based on the lessons learned from the previous Integrated Rural Development Programs (PIDER I, II and III), (ii) it then grafted itself onto SOLIDARIDAD, a large, ongoing national poverty reduction initiative; and (iii) it had taken full advantage of the ongoing decentralization process.

Government and donor willingness to use unified disbursement mechanisms

Unified disbursement mechanisms, in which communities and local government face the same requirements and procedures no matter who ultimately finances their expenditures, would significantly simplify resource flows and dramatically reduce learning and transactions costs and co-production difficulties. Unified disbursement mechanisms should become a single national system to transfer resources to communities and local government and ideally include all own government and donor funds. They should allow for coexistence of fungible development funds at local government and community levels for the bulk of resource transfers with small earmarked windows for exceptional needs and circumstances. Building these unified disbursement and accountability mechanisms should be viewed as a component of the reform of government's own

disbursement and accountability systems and embedded in the intergovernmental fiscal transfer system. Disbursement mechanisms are explored in detail in section 7.2.

What to do when decentralization systems are still poorly developed

The level of decentralization varies from country to country. Given different initial conditions, CDD programs can build incrementally from the specific starting point of their individual countries. At this point, however, a design team is likely to encounter difficulties when faced with the uncertain direction of the decentralization process. The best option is to work with stakeholders in the decentralization process to clarify the likely future institutional setup, as was done both in Burkina Faso and Mexico in the preparation of large programs. Based on findings, the design team can then design program mechanisms so that they fit into the emerging institutional structure, and can later be transferred to them. In Niger, for instance, UNCDF set up local development committees at the likely location of future local governments, with the vision that the local development committees could then be merged into the future local government structures.

Getting ready for the program development phase

Where pilots have already succeeded, scaling up is the next logical step. However, this can rarely be done in one big bang at the national level. All the tools and logistics for scaling up should first be developed and tested in one district or province, as in the Borgou pilot in Benin, or in a few districts or provinces, as in the Mexico's DRD or Indonesia Kecamatan Development Program. Such field-testing will quickly identify critical bottlenecks, which may, for example, prevent rapid disbursement, and may require legal or regulatory changes. It will result in a full set of logistics, operational and training manuals, materials and tools which can then be translated into other national languages and extended to and adapted to local conditions in a rollout process that ultimately covers all districts/provinces. Furthermore, the program development phase can provide useful cues as to how the national policy environment should be reformed to support the process. This section describes some of the preparatory steps at the national level to get ready for the program development phase.

The diagnostic phase

The purpose of the diagnostic phase is to answer key questions, which will be confronted by the program designers. The design team will have to develop these lists of key questions. An example of those questions is the following table:

Table 1. Example of key questions to be pursued during the diagnostics phase

The role of the center	Is central government already playing a coordination, rather than implementing role?
The capacity of local governments	To which extent are elected local governments accountable to the public and to CBOs? How credible are local governments on service delivery? Is central government transferring an adequate share of financial resources to local governments? Is central government transferring sectoral staff to local governments? Assuming that local governments have the power to levy taxes, how willing are they to tax their constituencies?
The capacity of communities and civil society	Do the communities already have a culture of self-mobilization and self-help? If yes, in what form? How strong is civil society?
The structure of the sectors	Are sector policies delegating service delivery to local governments?
Other or past programs,	Have past programs tried similar approaches? If yes, what can be learned from them? Are there currently any other CDD-type programs operating in the country to which the program could be grafted or with which it could collaborate?
Poverty levels	Where are the major pockets of poverty where the program should initially targeted or devote more resources?
Accountability systems	How is the accountability structure set up?

Answers to these questions can be found in the following types of analyses, many of which already exist in most countries. A key task, therefore, is to bring together the documents, which contain these analyses, and to complement them as necessary. Key analytical tools and reports would be:

- The *poverty assessment* identifies the major pockets of poverty, and analyzes its major causes at both the national and local levels. This information can provide guidance on areas which the program should initially target.
- The *participatory social assessment* examines village needs and priorities, as well as the socio-cultural, historical and political context of the program. It includes such tools as the stakeholder analysis and Strengths, Weaknesses, Opportunities and Challenges (SWOC) analysis.
- The i*nstitutional analysis* examines the capacity and deficiencies of the various groups that will be involved in the co-production of the program (communities, local governments, sectoral agencies, NGOs, etc.); identifies the institutions (formal and social) on which to build on at the community and local levels; and finally maps out the relationships between these institutions.
- An *analysis of existing planning and budgeting systems* examines the planning and budgeting systems within and between governmental structures and agencies. It also provides information on organizational and decision-making dynamics within government.
- The *fiduciary systems assessment* maps out the intergovernmental financial allocation and transfer systems. It also examines the procurement systems and accountability measures of the various governmental agencies.
- An *inventory of past or ongoing CDD-related programs* indicates where capitalization on, or harmonization with, other programs may be possible, desirable and/or required. Relevant programs may include single-sector CDD programs, Social Funds, local government development programs or funds, or broader decentralization or poverty reduction efforts.

Defining a common vision, objectives, and broad design features of the program

Following the diagnostic phase, the design team should host a national stakeholder workshop to get government and other stakeholders (including other external partners) to agree on what is to be scaled up and how. Issues to be discussed include:

- Major findings from the diagnostic phase
- The vision of the proposed program
- Objectives to be achieved, key components and key design elements of program
- Broad roles of different actors and levels (the details will be developed as part of the development phase itself)
- Institutional homes and lead agencies, at central and local level
- Expected outputs of the development phase such as detailed institutional arrangements, operational and training manuals, scaling up logistics, monitoring and evaluation reports
- Principles and major mechanisms of transparency and accountability system
- Objectives and accountability system of monitoring and evaluation
- Agreement on a detailed development phase
- Key questions to be answered in the development phase
- Expected outputs
- Expected cost, financing sources, and financing arrangements for the *development phase*
- Structure and composition of the *development team* from the lead agency/agencies and required specialists
- Record the outline of the program and agreements reached.

Selecting one or several districts

There is always pressure to cover more than one district, but the capacity to follow closely what is going on in more than one district is often lacking at the central level. Developing the program simultaneously in more than one district is therefore dependent on adequate capacity, and could be done, for example, in a Federation where separate development teams for one district each can be fielded in each state. A district can be selected based on its capacity depending on the complexity of the program to be designed. In Burkina Faso, for instance, the low-capacity Poni province was selected to pilot a relatively simple HIV/AIDS prevention program. The program successfully disbursed small matching grants to newly formed HIV/AIDS committees in 500 villages and urban neighborhoods, and within the span of several months had trained over 2000 program participants

and trainers on how to prepare simple village projects, monitor their outputs, manage financial resources, and on the basics of HIV/AIDS and its prevention. However, this was only possible because of the relative straightforwardness of the project. The approach relied entirely on existing or latent administrative and training capacities, and existing infrastructure within the province.

If one or more components of a program are particularly complex, however, it is preferable to select a district where local actors (i.e., communities, NGOs, and local governments) already have substantial experience with individual components or tasks that are to be scaled up. In contrast to Poni, the Sanmatenga province in Burkina Faso was recently selected as the pilot district for scaling up a multi-sectoral CDD approach to HIV/AIDS care and support. The district has relatively high capacity and would be able to master the complex design issues involved in the program. In urban areas, service delivery by NGOs and specialized community-based organizations (CBOs) was already partially developed. In rural areas, ample capacity existed in the already present structure of HIV/AIDS committees at the provincial, departmental and community level, the provincial and departmental training teams, the strong ability for participatory diagnosis and planning at community level provided by other community-driven projects, and the strong political leadership.

Finally, when selecting several districts, it is always best to select districts that have different capacities and characteristics. Lessons learned from each district may be useful when the time comes to scale up nationally.

Local buy-in for the development phase

Crucial to the success of the development phase is local buy-in. At the onset of the process, it is therefore necessary to hold, together with the lead agency and development team members, a participatory stakeholder workshop in the local area to expose all participating actors to the proposed program and the development phase. The workshop is attended by the program management committee, community leaders, the greater community, and, in particular, the top leader(s) of local government and local representatives of central government who will have to drive the process.

The workshop is a chance to discuss possible local implementation arrangements and mechanisms, as well as the initial list of possible local co-producers. Field visits by local stakeholders and development team to sub-districts and communities familiarize all stakeholders with the local institutional setup, capacities, and already existing local experience and programs on which to build. The program outline is then revised, refined, recorded and fed back to central stakeholders.

Information, education and communication

The communications program is central to promoting transparency and accountability. Information, education, and communication (IEC) activities have to meet awareness and learning needs, as also process monitoring needs. Among other things, the IEC program should aim to empower communities with the ability to self reflect, identify own needs, challenges and resources; extend the voices of the poor for participation in public dialogue; facilitate education and learning about sectoral and multi-sectoral topics for behavior change toward sustainable development and empowerment; facilitate community access to market information, access and values. [7]

Any mode of national media can be used for this purpose. The Malawi Social Action Fund for instance has designed a strategy that communicates messages to all stakeholders throughout the community-project cycle by using radio plays and television dramas. Messages are also broadcast explaining the importance of principles such as accountability, and transparency, and offering instruction on specific technical issues such as procurement and contracting. Where media is restricted, a highly effective way of disseminating information is the local radio, which gives daily information on the ongoing program, and does not pose the literacy-related problems of newsletters.

To meet process monitoring needs, an effective communication plan will also have to focus on the institution of multi-way communication, monitoring, evaluation and feedback channels between co-producing agencies. Bottom up and inter-agency linkages can be created to channel to all the stakeholders any relevant information on program processes, inputs, outputs and outcomes. Only then can deficiencies be corrected, designs adapted, and efficiency and equity be enhanced. Moreover, the information generated and disseminated by these systems is central to enhancing all forms of accountability.

Definition of actors, functions, and responsibilities

CDD needs to be seen as the co-production of outputs by a joint venture of communities, local governments and the central government, with support from the private sector and civil society. The previous section explained how to foster a common vision among stakeholders. This section explores the important tasks of consolidating program content and implementation arrangements, and assigning program functions unambiguously to different participants at each level, and fully describing them.

These tasks are best done at the local level and should preferably involve all the stakeholders, since only they have the detailed knowledge of the present actors, systems, processes and relationships on which the program will need to build. The process will usually involve one or several broad stakeholder workshops, the appointment of sub-committees, sub-committee sessions, and reporting back the results to the workshop plenaries. Such a process need not take more than a week except when specific social or institutional analyses are needed to clarify who can, and should, do what, where and how.

Depending on context, the country and design team may choose from a range of institutional options depending on existing governance systems. Despite variations, however, certain basic structures, as shown in Figure 2, will be needed to meet the management and coordination needs of the emerging program.

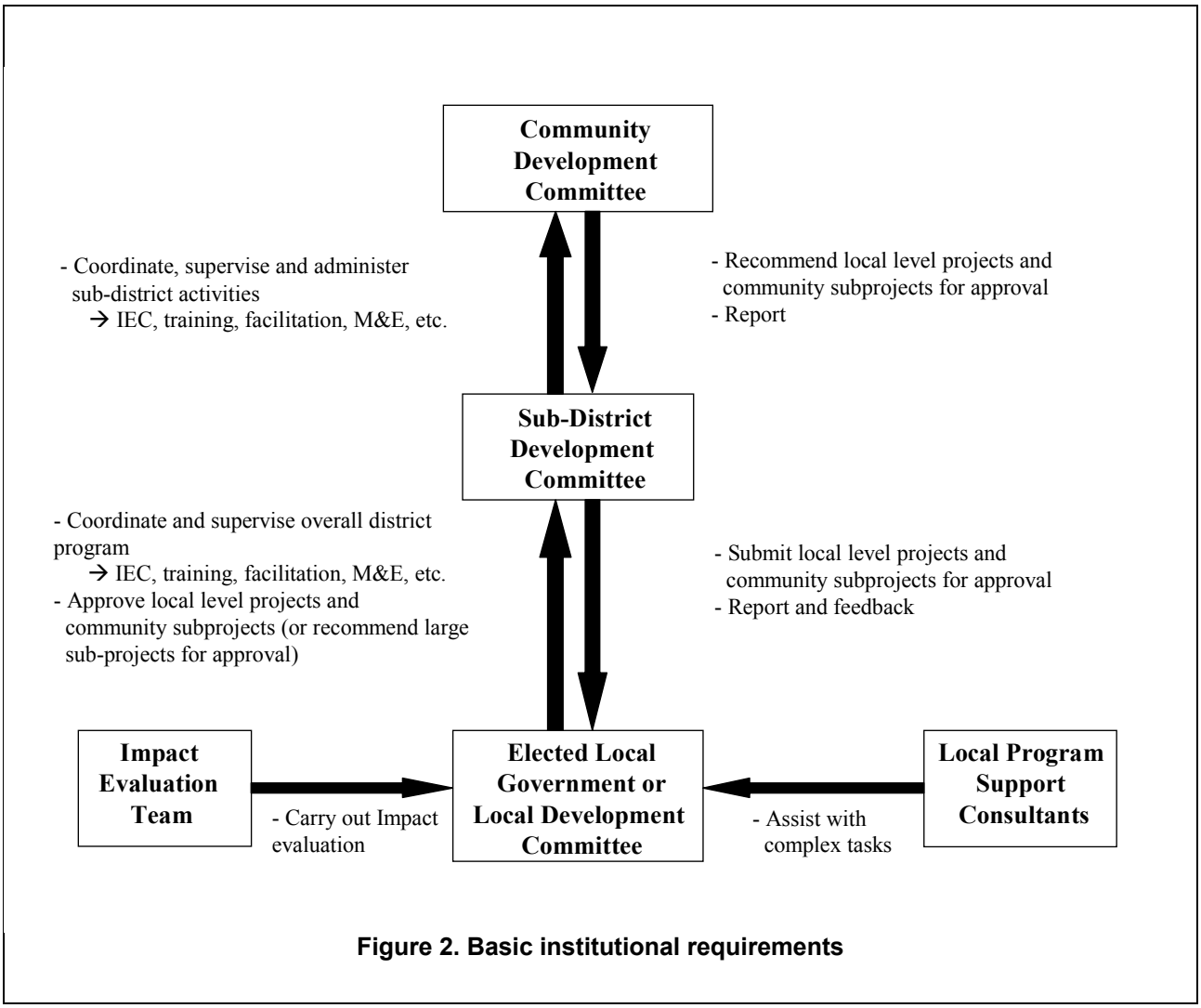

Figure 2. Basic institutional requirements

The community development committee

The community development committee is constituted in a similar manner and has similar functions to the district development committee. However, in contrast to the district development committee, it also has the implementation functions for the community development program and community projects, including managing the money, resource mobilization, contracting, financial control, auditing and reporting.

The committee is usually a legalized entity. It should preferably be elected by the community and its composition should include, but not be limited to, a chairperson, vice chairperson, treasurer, financial manager, and secretary. [8] In order to ensure accountability, reporting on physical and financial progress to the community is regular and made public. Moreover, specific mechanisms are necessary to ensure that membership in the PMC is representative of all groups, including women and other marginalized groups. Such social safeguards are important for guarding against elite capture and social exclusion.

The role of the community development committee is to manage all processes at the community level from participatory appraisal to program implementation, monitoring and evaluation and upward and downward accountability, and to delegate execution responsibility for specific community projects to sub-committees.

The district development committee

The District development committee should have broad representation from local politicians, sub-districts, communities, NGOs, relevant private sector actors, local managers, and technicians of deconcentrated sector agencies. These committees usually have sub-committees, such as for planning, project approval, monitoring and evaluation, financial control, education, health, water, agriculture, HIV/AIDS etc, which are constituted in a similar manner than the main committees.

Where local governments are nonexistent or nonfunctional, countries can start by setting up local development committees at the district level under the leadership of the local representative of the central government, as Cote d'Ivoire has done. These should mimic what would eventually emerge when local governments are formally constituted. Once a local government is elected, the development committee would be assimilated into the new local government structure and would include elected councilors

Therefore, options for the local development committee include:

- A subcommittee of the local elected council within local government with added members from civil society, the communities, sub-districts, and technical agencies
- Where there is not yet a local elected council, it could be a committee created by a central government agent such as the prefect or high commissioner, or by a law or decree of the ministry of local government

The role of the district development committee is to coordinate the local development and community-driven development program, including: the initial and subsequent information campaign and IEC program; coordination and supervision of the training, facilitation, and community and local planning process; coordination and integration of development plans of sub-districts; approval of sub-district and district level projects, recommendation for approval at higher level of large district projects; final no-objection or approval of community projects and projects of NGOs or local sector offices; recommending measures for local resource mobilitzation (from local revenues, cost recoveries, and other sources); monitoring and evaluation of the local development program and the performance of the different implementers; and reporting to the local and central authorities and the population at large.

Final approval of plans at local and community levels, and of projects or sets of projects can be a function of one of several entities, including: the development committee itself, an elected council, or for large local projects, a higher level authority such as the ministry of local development, a social fund, or other program or project unit. Disbursement orders are then given by the respective chief financial officer or treasurer, with checks signed by the person or persons designated in the operational manual or financial regulations.

Given the large number of communities in a district, evaluation and approval of the community annual programs or community projects should be delegated to the sub-district development committee. Another option is for the sub-district committee to vet and improve the proposals and submit them as a package for final

approval or non-objection to an approval committee of the district development committee. Still another option is for small projects to be approved at the sub-district level while larger ones are approved at the district level.

The district development committee is also responsible for designing and carrying out the district level IEC plan. Community radio can be used to communicate key messages to all stakeholders, convene meetings in an area where mail and telephones are weak, and serve as a two-way information device. Sri Lanka's community radio for instance has a panel of resource-persons whom listeners can phone in for a wide range of information and answers to problems. Where they do not exist, community radios can be set up at low cost with community contributions and district sponsorship. Other IEC options include community theater groups, or information dissemination during customary community gatherings.

Finally, the district development committee is responsible for monitoring and evaluation at the district level, and for reporting upwards to central government, downwards to communities and horizontally to other districts. Participatory monitoring and evaluation by communities can significantly reduce the progress monitoring functions of the district development committee and should therefore be made an integral part of the district M&E system. Regular reports in easily understandable form and expressed in local languages are needed to disseminate information on program progress and financial information and are integrated in the district IEC strategy.

The sub-district development committee

A local development committee cannot be expected to coordinate and supervise a local and community-driven development programs in districts, which have more than 300 to 500 communities, and further decentralization to the sub-district level is almost always needed. Such committees have similar functions and compositions to the district development committee, but the precise division of responsibility between the two levels should be part of the detailed definition of roles and functions.

Local program development support consultants

A district Development committee will not have the capacity to simultaneously provide day to day support to the entire local program development process and manage the process of assembling and revising the operational and training manuals and other tools, translate them into local languages and produce them in sufficient quantities, develop the detailed logistics, monitoring and document the progress of the program development phase, and ensure proper monitoring and evaluation and report writing. The local development team therefore needs to be supported by a small team of professionals with high-level skills in program development, writing of training manuals and operational manuals, participatory processes, and M&E.

It is therefore advisable hire a small team of *local program support consultants* to assist the local development committee and central development team throughout the program development process. Since these consultants are to support the development committee, rather than become the program designers themselves, it is important to clarify that they are in a support function to the local development council, and should not try to do the councils' development work. Clear terms of reference for such a team can prevent this from occuring. The TOR should be developed by a sub-committee of the local development council and approved by the local development council and the development team.

Particularly important functions to be included are:

- Assembling operational procedures, manuals, and tools from existing programs and approaches and integrate them into a single set of operational and training manuals and tools, and developing those components which do not already exist
- Continuously revising these materials in light of experience
- Assist the district in the development of its IEC strategy and tools
- Assisting the secretary and/or staff of the development committee(s) prepare the sessions and reports of the development committee(s)
- Reporting on the progress of the development program at regular intervals
- Assisting in the design and implementation of the monitoring and evaluation program, processes, tools and reports

Impact evaluation specialists

Impact evaluation of the pilot is critical in order to justify its subsequent expansion to national levels. It requires a good baseline of communities and households as well as subsequent surveys. The impact of the program is evaluated by comparing the changes that occurred with the communities and households which participate in the program and a set of comparator communities and individuals which do not. The evaluation is best done on a sub-sample of communities and/or sub-districts, which need to be randomly chosen. Control groups with no program interventions ("without treatment communities") are ideally located within the same district, but this is often politically difficult, because the communities/sub-districts that are left out will protest. In such cases the "without treatment communities" need to be located in neighboring districts, with some matching of the selected villages to observed characteristics "with treatment" villages.

Conducting impact evaluation is a research task. Often what is sought is not only the impact of the CDD program as a whole, but also of particular ways of implementing it, such as performance based allocation of resources, or the relative impact of training and facilitation versus the additional financial resources. To ensure objectivity, a separate group of *impact evaluation specialists* should be hired to conduct the impact evaluation. The researchers need to be coordinated closely with the design of the pilot, and with its monitoring and evaluation system. Coordination responsibility rests with the district development committee assisted by the program development consultants.

Training, facilitation, and participatory planning

Developing communities' ability to plan and map out their own development is the heart of a CDD program and requires that adequate training and intensive facilitation are provided throughout the planning process. However, in a district-level program seeking to reach three to five hundred communities, these activities will likely be tremendously costly. The following provides ways in which to minimize the costs of a large training and facilitation component, then explores the main issues involved in participatory planning at the community, sub-district and district levels.

Training and facilitation requirements at the community level

CDD requires training in a number of skills, including participatory assessment and planning, setting up or strengthening the community-development committee and its sub-committees, procurement and financial management, planning and community project preparation, auditing, participatory monitoring and evaluation. In addition training in technical skills will have to be provided for all but the simplest infrastructure community projects.

Within each community training will have to include between 4 to 8 people to ensure that members of different gender and age groups, minority groups, as well as community technical specialists receive training. If a district has three hundred communities, for example, this would mean the training of 1200 to 2400 people. Training also has to be provided to all other program participants who are engaged in any of the co-production tasks of the program, i.e. sub-district and district development committees, staff and volunteers from participating NGOs and sector agencies, and district and sub-district administrators.

Participatory planning (and monitoring) processes at all levels must be properly facilitated by outside trainers and facilitators. Facilitation will typically also be needed during the formation or election of village committees, community project preparation, and initial participatory evaluation to ensure social inclusion and adequate participation. Unlike training, the facilitation has to be done separately in each community or sub-district and district development committee.

Cost-Minimizing logistics for training and facilitation

If in each community four members are to be trained, and the district, for example, covers 400 communities in 10 sub-districts, the total mandatory training effort will exceed 2000 people. In addition to the community members, training would have to be provided to development committee members at the sub-district and district levels, and to specialized facilitators and service providers from the private sector, NGOs and line agencies. Training such large numbers separately within each community, and hiring professional trainers and facilitators for these activities is likely to be prohibitively expensive, irrespective of whether the trainers and facilitators come from the private sector, NGOs or government agencies.

Cost-effective training therefore can be organized in training camps at the district and sub-district levels. In the HIV/AIDS prevention program in Burkina Faso the villagers (one woman, one man, one male and one female youth) are assembled at the sub-district level for two week-long training workshops in which the elements of the project cycle and financial management are covered, as well as basic knowledge of HIV/AIDS and its prevention. A district team of trainers is formed and based at district headquarters. The district team trains, and then supervises, sub-district training teams, and supply training to surrounding communities from the sub-district or local market town. As in the Burkina Faso HIV/AIDS program, the program can also adopt the principle that no program participant should travel on a route other than the usual one to the market or local sub-district center, which sharply reduces the transport logistics and costs.

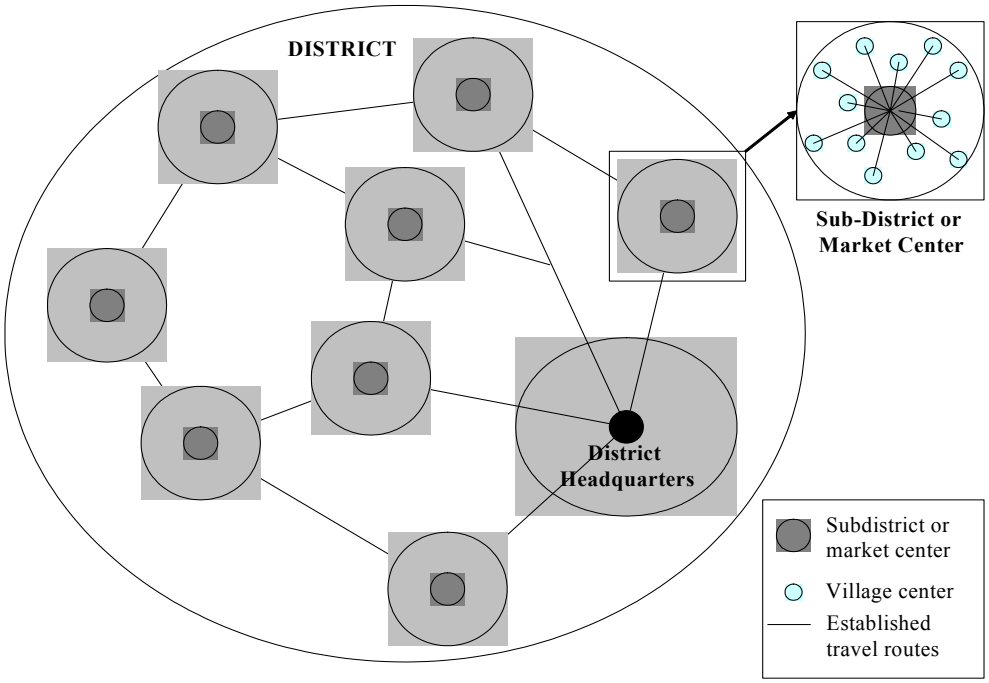

Figure 3.

The sub-district training teams are mobilized, selected and supervised by the district or sub-district development committees. They manage the training and teach, and mobilize local specialists for specialized training (nurses, doctors, agricultural extension agents, etc.). During program development they continuously revise and improve the training curriculum, sessions, materials and the training manuals. They are paid only for the days they work or receive training. Subsequent to the training, they can also be sent to villagers to facilitate program and community project development, either on a supply-driven basis, or at the request of communities for help. They are reactivated whenever a new training or facilitation needs arise.

To further reduce costs, sub-district training teams can be formed by mobilizing latent local capacities, i.e. by recruiting qualified local volunteers, such as retired people, educated spouses, educated youth, and village elders, who may previously have been teachers, health practitioners, agricultural extension workers, etc. Thus composed, four to six trainers can manage a sub-district training program of workshops, to be attended by four or six people per village.

An alternative or complementary approach is to organize specialized training and facilitation via a community-to-community extension approach, which relies and strengthens latent community capacities and therefore produces additional cost savings. The process begins with training program or a participatory planning exercise

facilitated by professional facilitators (hired from NGOs, government or the private sector) in a pre-selected lead community. Three to five representatives from neighboring communities are invited to participate, with a view to train them and the lead community to become trainers and/or facilitators. In addition to their participation in the exercise, extra formal training in specialized subject matters or facilitation can be provided for these representatives. The newly trained trainers/facilitators then return to their villages, occasionally accompanied by members of the lead community, to facilitate the participatory planning process and training of the population there.

Capacities to facilitate community processes can be significantly expanded at a very low cost by training some of the sub-district training committee members to become community facilitators. The training can be incorporated into the district Training of Trainers modules described above. These locally resident community facilitators can then be used to provide mandatory facilitation, or facilitation on demand by the communities, and be paid per diems for the days worked.

To avoid protracted negotiations about per diems with volunteer trainers and facilitators, per diems should be uniform, irrespective of the qualifications of the trainer or facilitator. They should be covering the costs of the facilitators and a bit of pocket money, rather than being important sources of income for the volunteers. Typically per diems allow trainers to feed themselves in little eateries, or to buy groceries and cook themselves.

Specialized training and facilitation for specific sub-sector community projects should primarily be demand-driven, based on the development plans of the communities. For that communities should be able to spend part of the money they receive to finance, or co-finance these services. The precise source and logistics of providing these services needs to be worked out locally by the respective sectors, in coordination with the district development council. Some district-level projects can be used to finance some of the basic costs of NGOs, private firms, or local sector offices of the government.

Participatory planning at the community level

The core outcome of the community planning process has to be the annual plan and budget, which is part of an outline of a longer term three to five year development program for the community. Requiring carefully written development plans at the community level in English or French leads to the domination of the planning process by the external consultants which will inevitably hired to produce the reports. In the Burkina Faso CDD program it led to a consultant industry consuming over two million dollars of the funds of the PNGT second phase program. Yet these documents were rarely used at the community level, and generated few added investments beyond the program

Intensive facilitation will be needed throughout the participatory planning process, in particular to ensure that all community members, including women and minorities, are given a fair chance to participate, thereby avoiding elite capture. A facilitator should spend at least half of that time in the village, either continuously, or in repeated visits.

Participatory planning at the sub-district and district levels

The most important output of planning at the district level is the annual district development budget -- and sub-district budgets if the sub-districts have their own budget rather than execute projects under the supervision and financial control of the district. The annual budget needs to be embedded in a clear understanding of the district priorities or plan (and sub-district priorities) for the next three to five years. International experience on planning at the district level is also clear. In the Mozambique Decentralized Finance and Planning Program, which builds on a pilot program of UNCDF in Mampula Province, the District Development Plans required the active participation of sub district administrative staff and communities. In fact, the government developed a set of guidelines on participation in district planning which promote the establishment of “local consultative councils” where community representatives and local administrations debate and approve priorities for the DDP and its consequent annual investment plans.

In many instances, however, too much effort and cost is required to prepare a three to five year plan for each of the sub-districts, which are often based on similar community plans, and then integrate them into a district plan. Attempts are also often made to integrate the multi-year district plans into regional, provincial or national three to five year plans. Attempts for such bottom up, medium term planning processes have systematically failed all

over the world. Requiring carefully documented and well written up three to five year plans leads to planning processes dominated by consultants, and to documents which will rarely be used for future decision making, which inevitably will take place in the annual budget decisions. Moreover, such attempts tend to delay or block the final approval of the plans, and they also delay the preparation and approval of the much needed and far simpler annual budgets for the district and all the lower levels. Yet a vision of what should be done over the next three to five years is important to anchor the annual budgets and reduce conflict over priorities. This can often be done in simple terms as agreed upon lists of priority projects.

The key lesson is simplicity. Report writing should focus primarily on core outputs, both in the form of simple documents in local language, and wall charts which can easily be understood and made widely available to the district and sub-district stakeholders.

Resource flows, resource allocation, and accountability mechanisms

Direct financing to communities

Central to the success of the program is that the fiduciary arrangements channel funds directly into the hands of communities. The funds should preferably be untied and provide an open menu of options, except for a negative list of what the money may not be used for. Earmarking should only be used in exceptional circumstances, where gaps in knowledge or stigma prevent allocation of resources to important national priorities, such as HIV/AIDS. The menu and negative list should have been designed in close consultation with stakeholders and experts.

Funding is typically accompanied by a set of rules and corresponding training that (i) ensure wide local participation; (ii) promote transparency and accountability; (iii) prevent fraud and misuse; (iv) avoid elite capture and social exclusion; and (v) ensure that the community can manage and maintain the asset after community-project completion through local resource generation mechanisms. Disbursements can be in tranches based on statements of expenditures. Verification of the proper use of the money is the primary responsibility of a communities' finance and audit committees, and the general assembly of community members. Auditing hundreds or thousands of small community accounts is not cost-effective. It should hence be part of the monitoring and evaluation plan, and carried out on a random sample basis. Audits should include the financial records, the decision-making processes, and the quality of the output produced.

For fiduciary and disbursement purposes, a "community project" can either be an annual community budget comprising several community projects, or individual community-projects. The first option is much more empowering, especially if it is combined with disbursement against the budget in two, or, maximum, three tranches.

To generate savings in fiscal costs, and improve ownership and accountability at the community level, communities should be asked contribute a predetermined minimum share of the cost of each of their projects. Whether in cash, labor or materials, such community contributions may constitute between 10% and 40% of total community-project cost. In very poor areas, the contribution may be entirely in labor and materials. In relatively more affluent areas, communities may prefer the cash option. Flexibility in this mix should be built into each matching grant.

The minimum co-financing requirement can also be used to incorporate national priorities into the program. In Mexico, for example, many municipalities started to build basketball courts, an eligible expense, but not high on the national set of priorities. The co-financing requirement for these community-projects was increased significantly and most municipalities shifted resources to other projects. Eventually a co-financing matrix set different co-financing requirements for different project types and adjusted them to the marginality of the municipality. These are ways to reflect national priorities without prohibition of certain projects or earmarking of funds, leaving greater autonomy and empowerment to the local decision making processes.

In certain cases, the laws or regulations of national governments may not allow direct disbursement to communities. Often, these laws state that money can only be transferred to legalized entities. Generally, however, legalization of the community group is a simple procedure, which only involves registering the

committee with the relevant government authority. In Ethiopea, for instance, a law was passed so that the minutes of the meeting reporting the formation of a community development committee are sufficient for gaining legal status and becoming eligible to receive public funds. Simple mechanisms can thus be found to assist this process.[9] If procedures are more complex, a short to medium term solution is to state in the Development Credit Agreement (DCA) that any community created for the purpose of the project is considered legal if it meets certain simple requirements. In the long term, however, governments will need to remove its own legal barriers to direct funding, so that the structure and approach can be sustained beyond the life of a specific donor-funded program.

Options for the allocation of funds to the different levels.

The basic two options for allocating resources to communities, sub-districts and districts are the following: Allocations could be based on proposals submitted from each of these levels to higher levels. Or they could be based on norms, i.e. be an entitlement of each level, as in the Burkina Faso CDD program, where a community's allocation is set at three dollars per capita.

In a large-scale program where there will eventually be thousands of community projects, there are several disadvantages to proposal-driven allocations. Communities and sub-districts will be tempted to submit proposals, the aggregate of which vastly exceeds available resources. The proposals then have to be sent back for cutting them down, inevitably leading to disappointment and disillusionment. Moreover, without a clear initial envelope, planning at each of these levels is much more complicated and may take on the characteristics of producing wish lists. The clear allocation of a norm forces choices to be made quickly at each of the levels. Norms can be based simply on the number of people, as in the case of Burkina Faso, or they can be based on more complex formulas, taking into account the degree of marginality of the community or district, and other factors. Bolivia's Rural Communities Development program for instance allocated funding to 100 municipalities selected on the basis of poverty, development potential and institutional capacity. On the other hand resources for productive investments were made available nationwide and allocated on the basis of proposals received.

Norms can also be used to allocate the small management budgets for the sub-district development committees and the training committees. These committees need small amounts of money for their functioning, and if they are not provided, the program quickly slows down, and key people initially mobilized turn away.

Increases in annual budgets or norms of communities, sub-districts and districts can be based on performance of each of these units, compared to agreed upon performance benchmarks. Lack of performance should lead to a constant or declining budget and fraud should lead to exclusion of the community from the program for one or several years. Zambia's Social Fund for instance created a graduation scheme setting positive and negative incentives in line with a set of pre-determined performance benchmarks. Under the scheme, no District Council is penalized for a wrong choice of projects to encourage learning-by-doing.

There are of course projects at the sub-district or district level, such as service provision by specialized entities, facilitation, etc., which cannot be based on simple population or membership norms, and in which a proposal-driven allocation process is inevitable.

Options for managing and disbursing the financial resources to the district, sub-district and community levels

Widely used options include:

- *A single district budget and development fund.* This model has been widely developed by UNCDF pilot projects in many countries. In the Mozambique Decentralized Finance and Planning Program, based on a pilot financed by UNCDF, the Government is establishing institutions and mechanisms to support districts in developing plans which are multi-sectoral and require alignment with the various sector directorates at sub-national levels to ensure that recurrent costs and sector standards are accommodated. The plans are the basis for allocating money to the district development fund and for mobilizing additional funds through the governments budgeting process as well as from other possible partners, including donors, NGOs and communities themselves. [10] Projects in the district development plan are executed by the district administration itself, and/or delegated to sub-districts, NGOs, the private sector,

and communities. The district budget then determines how much each community or sub-district benefits from the fund.

- *A district development fund with a special window for communities, or separate district and community development funds*. The advantage of having separate community or sub-district funds or windows is that it better ensures empowerment and learning by doing at these lower levels than a process which maintains all the allocation power at the district level. The disadvantage is that sequencing and economy of scale considerations are more difficult to accommodate than in a single, fully fungible, budget at the district levels. In Rwanda for instance, the government adopted an anti-poverty strategy to empower local government to provide economic and social services to local communities, while at the same time empowering communities to demand such services from their local governments. Thus, its Decentralization and Community Development Program supports direct funding of community community-projects following a bottom-up planning process which involves communities throughout the project cycle. However, financial management and funding for larger district-level projects will be done separately by the district administrations, with considerable institutional and capacity building at local levels.[11] As discussed above, allocation to the communities from the community window or fund could be based on proposals from these levels, or they could be based on ex ante allocation to each community and/or sub-district based on a formula. Other rules can also be devised to ensure an equitable allocation of resources. Mexico's DRD for example adopted the principle that at least half of the resources had to be used for rural communities within a municipality, rather than the central municipal town, and that it should preferably target the poorest communities. Local governments can be encouraged to contribute to the community window or the separate community fund, and thereby help co-finance the community projects. As result, funding for community projects would comprise of the joint contributions of central government, local government, the community, and donors, with a progressively decreasing role for donor funding to achieve long run fiscal sustainability of the program.
- *Channeling financial resources for communities through a special fiduciary agency, such as a Social Fund.* The Social Funds of the early 1990s widely used these options, and at the same time maintained all the functions of identification of beneficiary communities, facilitation and technical support, project approval, disbursement, supervision, and monitoring and evaluation. Increasingly the Social Funds have transferred the corrdination, identification, approval, supervision and some of the monitoring and evaluation functions to district development councils, as in the case of the Zambia and Malawi Social Funds. Today these Social Funds concentrate on program development and supervision, they assure the financial flows and ensure other the fiduciary functions, they monitor and evaluate, and they report government, donors and other stakeholders. In many cases, however, they still write the checks to the communities, after being given disbursement orders from the district development committees. So the power of approval and initiating disbursements is entirely transferred to the local level, while the actual check writing and reporting functions are centralized, *thus separating decision making about the resources from the actual resource flows*. This is an appropriate division of labor in environments where financial management capacities at the local government are limited and corruption at that level is rampant. Given economies of scale in these financial transfer and other fiduciary functions, this may also be an appropriate long term division of labor, and the "Social Funds" or similar specialized fiduciary agents could become permanent features of the intergovernmental fiscal system.
- *Channeling money through NGOs:* This approach was popular in the early 1990s, but has shown to have severe limitations. First of all the approach has tended to be very costly, increasing transactions costs, and therefore the pass-through rate of financial resources allocated to the program to communities. Second it tended to disempower communities, as usually the NGOs exercised to tight control over the resources. Third, NGOs rarely had the capacity to scale programs up to district or national coverage. Finally it eliminated the coordination functions of local government.

Monitoring and evaluation

A sound Monitoring and Evaluation (M&E) system has four broad components: participatory M and E by communities and users for implementation monitoring; financial and accounting systems for financial monitoring; Management Information System (MIS) for progress monitoring; and impact evaluation.

The M&E system should be simple and capitalize on existing systems. Pushing for standardization can also contribute to the consolidation of information at the local, national and donor levels. Implementing these improvements in M&E would require a small task force that would provide support to ministries and agencies

and contribute to strengthen national capacity. In order to be close to operations, this task force should consist of a network of monitoring and evaluation specialists spread out horizontally in the various sectors and vertically across the administrative levels down to the communities.

At the local level, M&E is the responsibility of the District Local Development Committee, the Sub-District Development Committee and the Community Development Committee. Programs frequently assign a special sub-committee, sometimes called the audit committee for this specific task. The audit committee is composed of either Local Program Support Consultants or government specialists whose role is to ensure that the system is properly designed, functions from the beginning, and is capable of producing regular outputs for consideration by the Local Development Committee, the Central Design Team and relevant government authorities.

From development phase to national scaling up

Once the program is running properly in one or a few districts, the operational manual, training materials, costs elements, monitoring and evaluation reports, initial impact evaluation results and other relevant instruments need to be properly reviewed, integrated and presented. These tools can all be reviewed and subject to final revisions at a national stakeholder workshop, which can also be used to consolidate the political will among the national government and external donors to scale up the program to national levels. The materials can then be translated into the major national languages. The materials are an essential input into the planning of the national scale up.

The planning process involves the preparation of detailed budgets, and a financing plan involving all possible sources of funds: national government, local government, communities and external donors. Financing norms and the pace of scaling up may have to be adjusted to fit the available financing to which the different partners are willing to commit. Budgeting and financing options include:

- Folding in similar ongoing programs into the new program. Similar programs may be financed nationally or from donors. Candidate programs should already participate in the participatory review of the PDP
- Allocating additional tax bases to local governments and communities which can be used for co-financing of the program
- Allocation existing national revenues and donor funds to the program via the intergovernmental fiscal system
- Raising additional taxes or donor resources for funding any likely shortfalls

It will also be important for all participating stakeholders to identify gaps in the national and local institutional framework and remaining bureaucratic hurdles, and to define time-bound plans to overcome them. Issues to be discussed may include the development of functioning local and sub-district governments, further alignment of sectors with the national decentralization framework and community empowerment, strengthening of the central institutions in charge of decentralization and local governments, further simplifying procedures seen as causing delays or bottlenecks, and addressing weaknesses in national statistical systems and PRSP monitoring.

Based on the experience in the planning phase, the national system for managing the program also has to be designed in detail, including in particular the central program office and its subsidiary branches, their capacities, terms of reference, and staffing.

Planners will also need to consider phasing. There may have to be two or three phases to reach national coverage, depending on the number of districts in the country, and the number of districts covered in each phase. Phasing options include:

- Focus first on the larger districts with better capacity, allowing a program to quickly increase the population reached. In Burkina Faso, the HIV/AIDS program's 13 lead provinces (out of a total of 45 provinces) covered more than half of the population.
- Select a range of districts with different sizes and capacity levels, allowing fine tuning of operational approaches and manuals to different situations

As in the case of individual districts, scaling up across districts, states or provinces will also require a detailed planning which pays attention to the costs of managing the program. Cost elements during the planning phase

and further opportunities to reduce them need to be carefully reviewed. Cost-minimizing approaches involve the same principles of minimizing travel costs, and mobilizing existing structures to manage the program rather than developing new ones or hiring special staff and consultants to do the job. Option for managing the large scale training needs of district program managers include workshops at the national level, the setting up of lead districts within which the neighboring districts can participate in the roll out in a learning by doing mode, and the use of district to district extension of the approach, or a combination of these approaches

At this time the implementation of the national communication strategy becomes critical.
The national monitoring and evaluation system and the impact evaluation program need to be put in place to ensure regular and speedy feedback during the scaling up phase. Similarly, a national IEC strategy will be needed to ensure national access to program information. Learning by doing never stops, therefore operational manuals and training materials should not be regarded as static for all time to come, but subject to at least annual revisions to build in the lessons from the scaling up phase.

Depending on the results of further social analyses, it may also be necessary to adapt design to special district conditions. Considerations that may arise include, for instance, inclusion of marginalized or stigmatized communities such as tribal groups which may require special facilitation, or sub-districts or communities with particularly pronounced social stratification or even conflict for which the central design team may have to provide special assistance to these areas.

The final step is a program launch workshop in which representatives from all the key co-producers and from the next batch of lead districts should participate.

Consolidation

After each phase of scaling up, a similar review as well as further refinements and adaptations to the institutional frameworks need to be carried out as after the initial program development phase. The consolidation phase should gradually shift the program from basic infrastructure and services to economic development and social protection. It should also focus on the concomitant development of the fiscal base of local governments and communities. With the basic structure in place, emphasis and resources can also go towards deepening accountability mechanisms, improving technical and organizational capability, and expanding targeted programs to tackle issues that communities may have neglected. Furthermore, the focus of CDD may typically have been on rural areas, but urban areas should be covered in the consolidation stage if not earlier.

Finally, as these elements are progressively being put in place, the program should work towards reducing donor dependence of the program and the ultimate exit of foreign donors. This can be achieved by increasing reliance at local and community levels on locally raised resources, while remembering the limitations of the poorest and most needy areas; by developing or strengthening the use of poverty formulas in the allocation of central government and donor funds; by developing the borrowing capacities of larger local governments; by fully integrating the non-local funding into the intergovernmental system; and by refocus donor finance on other programs, or phase it out altogether.

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Notes

[1] In single sector programs and in specific projects within villages and urban areas, communities are often defined as a group of people with a common interest, such as a parents' association or a water user association.
[2] For more information, see: The World Bank. Empowerment and Poverty Reduction: A Sourcebook. Washington, D.C., June 2002
[3] The World Bank, Local Development Discussion Paper, June 2004, Washington D.C.
[4] The World Bank, Local Development Discussion Paper, June 2004, Washington D.C.
[5] Aiyar S. and Binswanger H., Scaling Up CDD: Theoretical Underpinnings and -Program Design Implications, 2003
[6] *Political decentralization*: Local governments are characterized by (i) democratic political representation of local constituencies and (ii) a mandate to respond to local needs within devolved or assigned powers.
Fiscal decentralization: Local governments are (i) being granted a reliable, adequate share of central revenue and (ii) given the authority to levy, keep and manage taxes.
Administrative decentralization: (i) Administrative responsibilities are being delegated to local governments and (ii) central government sectoral functionaries are being transferred to local governments.
[7] Mozammel, M and Schechter, G.; *Strategic Communication for Community Driven Development: A Practical Guide for Project Managers and Communication Practitioners*; The World Bank. Feb. 2004.
[8] De Silva, Samantha. Taking the Lead: A Handbook on Direct Financing of Community Subprojects. 2002
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[11] ibid.

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Water in rural communities

Jacomina P. de Regt

This note focuses on how the community driven development approach is applied to this problem of getting water to rural communities. A recent review of World Bank water supply projects by OED shows that local community involvement in decision-making about services and in implementing and managing those services is linked to greater beneficiary satisfaction with services, and thus a greater willingness to pay. The Bank's experience with watershed management has similar findings. Significant involvement by local stakeholders correlates with better replicability and sustainability in outcomes and impacts. A lesser degree of participation is associated with a lower likelihood of sustainability.

Keywords: World Bank, water, community driven development

Introduction

This note focuses on how the community driven development approach is applied to this problem of getting water to rural communities. A recent review of World Bank water supply projects by OED shows that local community involvement in decision-making about services and in implementing and managing those services is linked to greater beneficiary satisfaction with services, and thus a greater willingness to pay. The Bank's experience with watershed management has similar findings. Significant involvement by local stakeholders correlates with better replicability and sustainability in outcomes and impacts. A lesser degree of participation—e.g., only providing materials and labor—is associated with a lower likelihood of sustainability.

However, it is important to note that water is a complex issue that involves multiple stakeholders from the community level to the international level, so community driven approaches are not the only model to use in all circumstances. The roles and responsibilities of each stakeholder will vary depending on the nature of the water service being delivered and on the level of water availability and scarcity in the area. Similarly, community driven development is an approach to development, not a model. The entry point, sequencing, and rules of the game established by the approach vary according to the nature of the society in which work is taking place. Understanding the complexities of both community driven approach and the nature of water services is important to understanding how community water and CDD fit into the broader water picture.

The importance of water

One billion people have no access to clean potable water and nearly 2 billion people have no access to sanitation. Over 5 million deaths per year are contributed to water related diseases according to WHO estimates, so better water management can certainly contribute to the health MDGs. Additionally, forty percent of the world's food supply comes from irrigated agriculture, and that percentage will increase as populations grow and arable land resources decrease. Agriculture is the single largest user of fresh water on the planet and it is also the largest economic activity of the rural poor. With 75 percent of the world's poor living in rural areas and relying on agriculture for at least part of their income, improved water management for agriculture can improve the livelihoods of a great proportion of the impoverished.

Learning from the past

The experience of development organizations and industrial countries exemplify the complexity of achieving success and ultimately achieving scale in water services.

The period from 1981 to 1990 was officially deemed International Drinking Water Supply & Sanitation Decade (IDWSSD), during which an estimated $133.9 billion dollars was invested worldwide. Approximately 1.6 billion people were served with safe water and close to 750 million with adequate excreta disposal facilities. At the end of the decade—according to WHO estimates—1 billion people still lacked access to safe water and 2

billion lacked sanitation services. Moreover, only about 25% of the $133.9 billion went to rural areas, where 75% of the poor in developing countries reside.

According to some experts, the IDWSSD did not achieve its intended goals because it was largely supply-driven and did not respond to demand, and it did not focus on sustainability. Evidence gathered from India toward the end of the IDWSSD showed that while many rural systems had been installed, maintenance of those systems was either assigned to overburdened state agencies, to local governments will little technical and financial capacity, or not assigned at all. The government estimated that "inattention to maintenance [cut] the useful life of water supply systems in rural areas by 50 to 75 percent." The same survey found that "only about one-half of the villagers ostensibly served by handpumps were actually using them."[1]

Additionally, the global initiative was not able to overcome the weaker voice in policymaking that has plagued rural populations due to their poverty, their distance from policymakers, and their wide dispersion across a large area, which inhibits them coming together as a unified lobby.[2]

The experience of industrial countries provides interesting lessons on programs that have worked and good intentions that had unintended results. The Ruhrverband (the Ruhr Water Association founded in 1913 in Germany) is an example of an institutional arrangement that included all stakeholders in decision-making—communities, districts, public and private sector; charged fees and levies to cover its costs; and treated water as an economic resource by weighing the costs and benefits of proposed actions. Its management principle was essentially the rule of subsidiarity — assigning responsibility for managing water infrastructure to the lowest appropriate level—i.e., Ruhrverband managing trunk infrastructure and municipalities managing feeder infrastructure. This model was successful and was gradually adopted by neighboring jurisdictions. France applied the principles of the model, but included a much larger role for the private sector, which better suited the country's situation. Through the rest of the century, as environmental issues grew in prominence in Europe and the European Union formed, new uniform standards were applied across Europe. Germany and the UK have adhered most closely to these uniform standards — The UK privatizing all water services and Germany remaining largely public. In both systems, costs have risen, the public has been distanced from the providers, and consumer dissatisfaction has grown.

A similar trend has happened in the U.S. where federal environmental standards for water were legislated and handed down to local jurisdictions. Dissatisfaction at the local level eventually led to a court case where the federal requirements were deemed to be "wasteful, unrealistic and unworkable". To find a workable model, the federal government commissioned a study, which recommended developing institutions for stakeholder involvement and considering the costs and benefits of actions within each local context.[3]

The experience the IDWSSD and of the industrial countries has shown the importance of local and client involvement in the determination of what services are delivered and how they are managed. This principle is firmly embedded in both the community driven approach generally and in the principles guiding the water sector. Today donors, development agencies, and developing countries and NGOs have achieved a high degree consensus on how to manage water resources; however the nature of water services and community driven development lead to additional complexities in the implementation of reforms.

Water services

Supplying water to communities is not a simple issue. It is important to note that water services are not limited to rural water supply and sanitation. There are actually numerous competing interests for water—drinking, sanitation, irrigation, energy, and navigation. Communities have a significant role to play in managing and even the delivery of water services, but the complexity and cost of the issue requires new roles for government, civil society, the private sector, and donors as well.

Water supply and sanitation (WSS) is almost always discussed together, which belies the fact that it takes two different sets of institutional arrangements to effectively deliver the services. In rural areas, water supply is more of a communal good, whereas sanitation is handled more as a private good at the individual household level. Additionally, WSS alone is not sufficient to get the health impacts needed by so many communities. Hygiene education links the two services into a health-benefiting package for communities, but it also leads to the complexity of projects and the need for a longer-term presence during implementation. The experience of

the Bank and other donors has shown that a community driven development—referred to as the demand responsive approach—results in more equitable and efficient management and a greater likelihood that water points will be maintained, user fees will be collected, and the water resource will be sustainable.

Agriculture is still the primary economic activity undertaken by rural people, and it's also the largest user of freshwater resources in the world—comprising 70 percent of freshwater withdrawals in 2000. In water scarce areas the need to balance agriculture and drinking water can be severe. The Bank's strategy for irrigation and drainage (I&D) emphasizes the need to manage irrigation water more efficiently to limit waste of a scarce resource. Based on experience—which shows increased efficiency and sustainability of infrastructure—the strategy calls for empowering communities (water user associations) and realigning the government to better manage the resource.

Beyond CDD, in both rural water supply and sanitation and irrigation, additional issues such as technical quality, supply chains for parts to maintain water points, concessions for service providers in some instances, and land and water rights are equally important to successful interventions that can be scaled up to a national program.

A watershed is a coherent geographical unit covering the whole area from which water drains into a river, from its source to its mouth. *Watershed management* is concerned with sustainable development based on the use of all the natural resources of a watershed. Regardless of the chosen micro-level investment—drinking water borewells, schools, health centers, roads—using watershed management principles to plan investments forces communities and government to incorporate conservation practices for maintaining natural vegetative cover to help control erosion, thus reducing downstream sedimentation and flooding and regulating stream flow.[4] Effective planning by using watershed management principles helps stakeholders evaluate the potential and limitations of these land resources and to resolve conflicting issues that arise during their exploitation. Since most decisions about how to use natural resources are taken at the community level, empowering communities to manage these resources in a watershed is a critical element of success. A recent review of watershed management programs showed that the most successful ones empowered communities to make decisions about the use of resources and to manage the resources themselves. However, given that a watershed usually covers multiple local jurisdictions and requires knowledge from a variety of technical areas, linking with decentralized government systems and technical line ministries is critical for overall management success.

International basin management addresses the need to manage water resources across national boundaries; the critical interaction necessary between national governments that share a primary water source—such as the Nile River Basin, Lake Victoria, the Baltic Sea and others.

As the Finance, Private Sector, and Infrastructure Group of the Bank pointed out in their strategy for Africa:

> All countries in sub-Saharan Africa share at least one international river basin, leading to growing interdependence between states. As future improvements and expansions to WSS services are planned, the water resources context will become increasingly important.[5]

This situation is not unique to Africa. In fact, "the United Nations estimates that two-thirds of the world's population will face severe shortages of freshwater by 2025."[6] The experiences of the Global Environment Facility provide insight on how to link local actions to global frameworks for cooperation on water resources.

Community Driven Development

As stated above, CDD is an approach to development, and it is one of many that donors and countries will use to manage water services. The experience of the Bank and other donors has shown that there is no one-way to use the CDD approach. The examples discussed later in this case illustrate the number of entry points and institutional arrangements that can be used and facilitated by donors and countries. With this being the case, it is impossible and unadvised to have a blueprint. Rather, practitioners can draw on a set of general principles learned from experience and apply them within the specific local context.

Box 1. Community Driven Development principles

1. Empower communities: participatory decision making, resources and authority to implement, PME;
2. Empower local governments: fiscal and administrative decentralization;
3. Re-align service delivery of central government: policy and enabling environment; information to communities for decision making;
4. Ensure transparency and accountability at all levels; and
5. Make it a learning by doing process and build capacity along the way.
6. Commit to long-term reform for the institutional development to take hold and be sustainable.

At the heart of CDD is the need to *empower communities* to take charge of their own development. Tools such as participatory decision-making, participatory monitoring and evaluation can be used to bring community views into decision-making. Experience has shown that when development interventions align to the priorities of a community, the sense of ownership increases, as does the likelihood that a community will work to maintain the results, thereby increasing the chance of sustainability. CDD also advocates *empowering local government*. To build sustainable institutional arrangements, the CDD approach must ultimately link with the system of governance and be accepted by the government as an integral part of their system. Introducing communities and decentralized local government as active stakeholders in service delivery makes it critical to *realign the role of the central government and line ministries* to set policies and regulations, provide oversight of the system, and provide technical information and assistance as needed. The new institutional arrangements implied by the CDD approach require trust among the stakeholders in the new system, along with mechanisms for *ensuring accountability and transparency*. CDD works to increase reliable flows of information down to the community and up to the national government. It fosters civic engagement—through tools and mechanisms like:

- social audit of the district assemblies common fund in Ghana;
- community audit of public resources in the Malawi Social Action Fund;
- the proposed Performance Tracking Facility in a Local Government reform program in Ethiopia;
- community based monitoring of the Poverty Fund in Uganda.

At the heart of the CDD approach is fostering a *learning by doing* system for the beneficiaries and practitioners of development throughout the project intervention and beyond. A CDD project must have an intensive monitoring system that collects a range of information and feeds it back to all the stakeholders in a timely manner so adjustments can be made to correct mistakes and understand and repeat successes. Finally, countries, communities, and donors need to understand that this kind of systemic reform takes time. They need to *commit to a long-term and sustained* presence to embed the reforms into the system.

Practitioners and policymakers need to remember that community driven development is not a one-size-fits-all model. Rather, its an approach based on some shared principles that can and should vary depending on the context in which it is applied—working directly with communities, with line ministries, with NGOs, with local elected government, with the private sector. The combination of stakeholders, their roles and responsibilities, and sequence that they are brought into the project is determined by the country and local context. The principles of inclusion and ownership; capacity building; intensive monitoring, learning, and communication; and long-term commitment to the reform process play an obvious role in whether community driven development is successful or scalable.

The examples discussed in the next section illustrate how the goals of the water sector and the principles of community driven development can be combined to achieve effective programs with positive impacts for rural communities. These programs have also been scaled up to the national level or are in the process of scaling up. The following section summarizes the lessons from these experiences that should be considered by other programs that wish to reach a national or international scale.

What is working

The Bank is currently applying the lessons of the past to a new generation of water projects. Results from initial projects were good, and the follow-on programs are building on the successes and lessons of their predecessors.

Rural Water Supply and Sanitation in India: the Impact of Swajal[7]

Ongoing rural water supply and sanitation projects have been very successful in India, especially in their demonstration that the community-driven, demand-responsive approach works. The Bank-assisted Uttar Pradesh Rural Water Supply & Environmental Sanitation project (Swajal) has been acknowledged nationally and internationally as a best-practice example in implementing a community-driven approach.

Uttar Pradesh has a population of 160 million, with about 80 percent living in rural areas. It is one of the poorest states in India and the two project areas selected, the Hills and Bundhelkhand, are the most water-scarce in the state. The two areas feature vastly different levels of social capital, which allowed for comparison of impacts based on the initial level of social capital development.

The existing system for delivering rural water service operated through UP Jal Nigam (UPJN), a highly-centralized, excessively-staffed public sector organization. UPJN's top-down approach rarely takes consumer preferences into account. There is no capital cost recovery, and operation and maintenance (O&M) costs are rarely collected. Poor O&M is a major problem, with about one-third of schemes non-functional at any one time.

Swajal is testing the demand-responsive approach in collaboration with NGOs as an alternative service delivery mechanism that will strengthen the capacity of rural communities to plan, implement and maintain their water supply and sanitation schemes. In this arrangement, the project management unit (PMU)—an autonomous agency facilitates, coordinates and monitors activities. NGOs provide an integrated package of engineering and community development support to the project villages and serve as a link between communities and the PMU. Village Water Supply and Sanitation Committees plan, implement and manage the water and sanitation schemes.

The Swajal project is delivering sustainable health and hygiene benefits to the rural population by improving water supply and environmental sanitation services; and promoting the long-term sustainability of the rural water supply and sanitation sector by helping government of UP identify and implement an appropriate policy framework and strategic plan. The ultimate goal is to scale-up service delivery.

When Swajal began, it essentially bypassed the sector line ministry and local governments (PRIs) and when straight to communities. The first option was not seriously considered because the UPJN did not have the experience or capacity to implement a community-driven, demand-responsive approach in rural water supply (RWS). The second option was taken more seriously because the PRIs in rural areas were set up to manage all rural development activities. This option was finally ruled out because it was felt that the PRIs in UP, despite being elected bodies, did not yet have the capacity and inclination to facilitate a demand-responsive approach.

The project has reached 1206 villages since it began in 1996, 1112 of the village water supply committees are still functioning and over 90% of water infrastructure in the villages is well maintained. More importantly the success of Swajal has influenced the GOI sector reform agenda, and as of 2002 the reforms are being implemented at some scale in 63 districts in 26 states in India targeted to cover a population of 70 million. The government of India has set aside about $400 million for the sector reform program.

New RWSS projects in Karnataka and Kerala include a central role for rural local governments (called Panchayat Raj Institutions—PRIs), and aim at providing PRIs and community organizations authority and control over decisions and resources, the direct responsibility to manage internal and external resources, and the ability to make allocation decisions. These should make allocations more responsive to the poor, lead to more sustainable outcomes, and increase the power of poor communities to negotiate. The participatory evaluation methods of sustainability monitoring using the village immersion process that was pioneered in Karnataka has become an integral part of the borrower's implementation supervision.

Given India's vast RWSS needs, scaling-up is important. Joint sector work and dialogue with GOI have helped in influencing government policies and in moving towards a common approach, irrespective of funding source. GoI launched its own Sector Reform Pilot Project in 2000, following the same reform principles. This covers 64 districts in 26 states covering 70 million people, with total commitments of about US$400 million. 20% of the total GoI funds provided to the states for RWSS are allocated for implementation using the reform

approach. One state viz., Maharashtra has taken a policy decision to implement the reform approach statewide; and a project is under preparation for proposed Bank support.

Further scaling-up is necessary and various options are being pursued/explored: (i) continued demonstration of the decentralized service delivery model in more states; (ii) encouraging statewide implementation of the reform approach in selected states, irrespective of funding source; (iii) building GoI/States/PRIs' capacity to manage reforms; (iv) possibly Bank-GoI co-financing to further reforms; (v) partnerships with other development partners who are active in the sector e.g., DANIDA, Dutch, DFID, KfW, UNICEF, and Water and Sanitation Program (WSP).

Ghana community water & sanitation

In the early 1990's the Government of Ghana created the National Community Water and Sanitation Strategy and Action Plan (CWSP), the product of a national policy reform to which all donors signed. The first Ghana Community Water Supply & Sanitation project was intended to support the reform program and complement the existing activities of the central government water authority, which would focus on building larger systems.

The program evolved out of a set of national workshops on improving water supply and sanitation in Ghana. These workshops, which involved stakeholders from all sectors of society, produced a strategy and action plan for reorganizing the development of rural water supply and sanitation (the CWSP). It used the community-driven, demand responsive approach where rural communities identified their needs and the level of services they could manage and for which they were willing to pay. The new institutional arrangements included all levels of government, NGOs, communities, and the private sector to provide and co-manage services.

In terms of impacts, the rural water supply program more than achieved its physical targets. Beyond that, it increased the capacity of NGOs, so that they could provide technical assistance for water supply. It also built capacity of small entrepreneurs to supply equipment for the infrastructure. The increased competition, created in response to increased demand from communities, led to a 50 percent reduction in the price of boreholes. The project also made specific achievements in gender representation with women comprising 50% of water and sanitation committees (WATSANs). In addition, the WATSANs began diversifying into other areas – such as environmental services.

The follow-on project is helping the government scale up the approach to a national program. Progress began slowly with the first 18 months spent working with the government agencies and communities to learn and accept their new functions in the reformed system. Now two years into implementation, the project has taken off and is working simultaneously in 1000 rural communities. The program is also piloting community contracts (currently the local government contracts) based on lessons learned at a World Bank international conference on CDD held in April 2002. District level agencies manage the program and now handle most of the procurement for infrastructure – now decentralized from the national level, and many districts are now supporting the operating costs for water supply themselves.

Irrigation rehabilitation in Albania

While Ghana shows how government reform programs create the conditions for using the CDD approach, Albania shows how learning from success on the ground can influence reform at the national level. Albania is currently the poorest country in Europe. As 50% of its GDP relies on agriculture, much of which is irrigated, effective and efficiently managed irrigation systems are necessary for economic growth. This is especially true, given the limited land resources available for agriculture, and the unreliability of rainfall. The Albania Irrigation Project reflects principles advocated globally by water professionals—bringing in the local level by working with water user associations and realigning the roles and responsibilities of various stakeholders to make a more efficient system.

The project is an irrigation modernization program that deals with reforming institutions by changing the roles of governments, users and private sector: communities operate and maintain the irrigation and drainage systems at the farm through secondary network level; governments invest mainly in headwork infrastructure, provide regulation and emergency assistance; and the local private sector is contracted to do the work on most of the activities.

The program began when the World Bank sponsored a study tour of Albanian officials to Turkey to see Turkey's reformed irrigation management program. This experience convinced the Albanian government to try the approach for its own system. Senior Albanian government officials helped introduce the reform by disseminating the concept of WUAs to farmers.

The first step was to establish trust between farmers and the project, by first rehabilitating canals and then gradually empowering farmers. Water Users' Associations (WUAs) were started on a pilot basis; however, once there were 'results on the ground,' they were provided with the autonomy to determine irrigation charges themselves and to manage O&M at the farm and then secondary canal level. Over time WUAs have taken on increased responsibility, so that they now manage primary networks—through federations of WUAs.

The impacts of the project reinforce the findings of the water sector—increasing the community role in managing water resources leads to better investment performance, cost recovery, and increased efficiency. The first irrigation and drainage rehabilitation project (1994), had as objective to (a) help emerging small private farms to increase agricultural production through rehabilitation of critical irrigation and drainage facilities; and (b) ensure the long-term sustainability of irrigation through the introduction of participatory irrigation management.

By 1998, the irrigation intensity had increased from 20 percent in 1993 to 60 percent. The scope of WUA responsibility far exceeded what was planned. More than 200 water user associations (WUAs) had been established over an area of 100,000 hectares involving 50,000 families, and 42 secondary irrigation canals covering about 98,000 hectares had been transferred to these WUAs. The WUAs collected funds from members for operation and maintenance of the secondary canals. Staff numbers in the public water enterprises were reduced within the project by 40 percent and 6 federation of WUAs (FWUAs) had been established to manage irrigation canals.

Before the approval of the second project in April of 1999, the progress was satisfactory, with 65 percent of the total irrigation and drainage area rehabilitated two years ahead of schedule, on budget, with satisfactory quality, using national, private engineers, contractors and supervisors. A follow-up investment project is now under implementation that aims to strengthen WUAs and establish a national legal framework for them. The government is also reforming the Water Code based on this experience.

Community water in a multi-sector setting: Northeast Brazil

Northeast Brazil is the largest pocket of poverty in Latin America. It has a rural population of 16 million, with 7.5 million people living on less than US$1/day. The need for social, infrastructure, and economic services is considerable.

The Rural Poverty Alleviation Program was actually 8 projects in 8 states of NE Brazil, which resulted from reformulating a program that was not working. It drew on the lessons from a small, successful community-driven component in the previous project. This is an example of a fully multi-sector CDD project, where communities propose subprojects and manage the implementation process and subproject funds.

Based on evaluations, 77% of the subprojects were for infrastructure --- including rural water supply and small-scale irrigation. To date, communities in NE Brazil have implemented over 50,000 subprojects, and the results are impressive: 7,000 communities have water systems that they operate and maintain; 600,000 families now have access to good quality water; and the cultivated area has increased by 85,000 hectares.There were also efficiency gains to the government from water subprojects. For instance, the CDD approach proved to be 30-40% cheaper than traditional models, which freed government funds for other priorities. There were also US$39 m./year saved by not having to use water trucks to supply families with drinking water in this dry region; and US$42 m./year saved from improved health and time savings.

Communities have diversified into a wide variety of activities, including income-generating endeavors. Some have even begun exporting goods to Europe. They are organizing to leverage funds from other sources – state, federal, and other donors. Some have even graduated from the program and now access private credit.

Over 1000 municipalities have adopted the participatory approaches used by the program. State and Federal programs are now adopting the approach as well. The next generation of projects has expanded to 10 states. This has been one of the Bank's learning projects, with many groups from other countries visiting to see how the project works.

The project showed how the CDD approach can be affective for delivering water services. It also illustrates the multiplier impacts that these services can have. Two lessons from this project are that involving local government contributes to improved institutional reform. Also, in terms of community water projects, the management units have recognized the need to coordinate water management at a higher level, to make sure that the cumulative affect of community projects doesn't damage the availability of water.

The next project illustrates the complexity of water services and the need for community and government cooperation even better.

Eastern Anatolia Watershed Rehabilitation in Turkey

The Eastern Anatolia Watershed Rehabilitation Project illustrates how the rule of subsidiarity can apply as activities move up the water resource chain. The project sought to restore sustainable land-use management to degraded watersheds in three provinces of the Upper Euphrates River Basin; and increase the incomes of the local population living in these areas, which are among the poorest in Turkey. To do this it had to help restore sustainable range, forest and farming activities, reduce soil degradation, erosion and sedimentation in reservoirs.

A major component of the project focused on the need for institutional and behavioral changes among communities and government. It promoted inter-sectoral agency cooperation at the provincial level (agriculture, forestry and small-scale irrigation); and the local population was involved in creating watershed rehabilitation programs.

The project has reached about 400,000 people living in over 50 watersheds. Integrated management plans were prepared including improved management and cultivation of fodder, reforestation, soil conservation, improved arable farming and fruit farming, construction of ponds for supplementary irrigation, bee-keeping, and gully protection.

The project has strong support at both local and national levels. After a successful beginning, the approach was extended to six more provinces in southern and southeastern Turkey and will now be adopted in up to 20 more provinces in a follow-up operation. This is just over 1/3 of the country's 80 provinces. The project has benefited from a high degree of local commitment (it increased local empowerment). It improved opportunity and access to resources through targeted interventions, was cost-effective and could be maintained despite a difficult macro-economic environment. A natural resources and poverty reduction project using a similar participatory approach is under preparation in Armenia, and the follow-up project under preparation for the Turkish Black Sea and Mediterranean region will also support nutrient reduction programs.

The project was modest in its initial objectives and this may also have contributed to its success. The design was flexible and the menu interventions could be adapted as new technologies were developed and to suit changing socio-economic circumstances and variations in geography and ecosystems. Experience also shows, however, that a long-term commitment by government and donors to interventions of this type is necessary, as has occurred in Turkey.

International Basins: the Nile Basin

What does a village water user group in Tanzania have in common with a farmer's group in Lower Egypt? Both communities—although separated by 6700 kilometers—compete for drinking water, sanitation, irrigation, drainage, energy, navigation, and environmental services from the Nile river basin. The Nile is world's longest river, with 10 riparian countries competing for its resources. Half of those countries are among the world's ten poorest: Burundi, DRC, Egypt, Ethiopia, Eritrea (observer of NBI), Kenya, Rwanda, Sudan, Tanzania, and Uganda. The river basin is home to about 160 million people, while the total population of the riparian countries is around 300 million, and population is expected to double by 2025.

This situation presents the potential for scarcity and hardship. However, the 10 countries have turned it into an opportunity for 'win-win' gains in energy availability through power interconnection; food production; transportation; trade and industrial development; and environmental conservation. In 1997, they formed the Nile Basin Initiative where, for the first time, all riparian countries are working together to establish a legal and institutional framework for sharing water resources equitably.

There are two sub-programs being formulated: the Basin-wide program is the Shared Vision Program (SVP) that will build trust, capacity and an enabling environment for investment; and the sub-basin investment programs include Eastern Nile Strategic Action Program (ENSAP) and Nile Equatorial Lakes Strategic Action Program (NELSAP).

Donors are organized in the International Consortium for Cooperation on the Nile, chaired by the World Bank, but it is important to note that the donors are *facilitators* in this initiative. It is driven by the countries.

Since the primary interaction with natural resources—such as, water—happens locally—on the farm, in the household, etc. —community subprojects that promote sustainable resource management and build the capacity of communities and local authorities to plan their resource use can be an invaluable contribution to the larger water management continuum within the Nile Basin.

Cooperation on water resources management might also serve as a catalyst for greater regional integration, both economic and political, with benefits far exceeding those derived from the river itself.

What it takes

These experiences and many others with CDD and community water services provide great learning opportunities as governments and international organizations work to achieve the millennium development goals.

Water specialists and CDD specialists have been examining results from past efforts and applying lessons learned to create new approaches to solving difficulties in getting efficient, effective water services to rural communities. The result is that we know what to do, and we know that there is no blueprint for doing it. Success is formulated by a mixture of investment, policy and institutional reform; capacity building and learning that will vary with each country and even with each region within a country. This section breaks down the CDD principles and Rio/Dublin principles into specific "ingredients" for a successful community driven water program.

- *Ensure client ownership of the process.* Whether or not water or community empowerment is used in Bank programs should be determined in the stated goals of the government—through the PRSP or CAS, for instance. To use the community driven approach requires powerful political champions to support the legislative and bureaucratic changes that CDD entails. At the community level, it is important to include community groups early in the project design, so they have a sense of ownership of the development process.
- *Adapt program design to local conditions.* It is impossible to achieve sustainable outcomes and impacts if the communities do not see the result of a program – water pump, irrigation canal, or other - as useful. *Rural Water Projects: Lessons from OED Evaluations* (March 2000) stresses that "great care must be taken to base projects on local practices and traditions rather than internationally generalized models that specify how villages ought to behave."
- *Shift from top-down to bottom-up, demand-responsive approach.* Studies and reviews of water supply and sanitation, irrigation, and watershed management have shown that community involvement in the design and management of water systems leads to greater satisfaction with the water service and greater sustainability of the service.
- *Involve multiple stakeholders to co-manage programs and services.* The high cost of scaling up suggests a continued sharing of costs; no one entity can shoulder the cost burden of providing water services to rural communities. Rather, pursuing a co-management model that involves a mixture of private and public funds from local, national, and international sources can diffuse the cost burden and make water supply more stable—not linked to just one source. . Currently developing country governments,

communities, and the domestic private sector cover 64% of the cost of supplying water services globally on average, while donors contribute 12%. A similar distribution of costs is likely to continue.

- *Support an enabling government policy environment for delivering water to the community.* The enabling policy environment should support the institutional arrangements and resource management necessary for good investment, operation, and maintenance of water services. First, the legal environment should allow entities like community groups, local NGOs, and local government to be effectively involved in management of local water sources. This may require popular participation, legal reform, decentralization reform, and the reform of intergovernmental fiscal systems, among other actions. Similarly, the private sector—local and international—should have the freedom to operate in the country, which could require changes to the legal and regulatory environment affecting investment. Second, the policy and regulations governing water resources should reflect good management practices—on user fees, tariffs, water rights, etc.—and provide guidance on attainable and maintainable technical standards to ensure quality services to all.
- *Link water and its management up the resource chain and the chain of government.* Commonly referred to as the rule of subsidiarity, both community driven development and water professionals advocate managing resources (e.g., water) at the lowest appropriate level. Therefore, water user associations may manage and maintain a community water pump or a section of an irrigation system. Local government may maintain or collect fees for a group of communities or farm systems in its jurisdiction. Decentralized subnational government may monitor water usage and arbitrate on water conflicts within its jurisdiction. The national government may set water policy and an operating framework for the country as a whole, in addition to negotiating with other national governments that compete for a water source—such as in the Nile river basin.
- *Approaching monitoring & evaluation as a management and learning tool*. The Bank and its donor partners are focusing more on the need for effective monitoring and evaluation systems to measure progress toward corporate and the Millennium Development Goals, as well as to measure project and policy results in order to guide needed changes. M&E is coming to be seen as a management and learning tool that allows all project stakeholders to be flexible and quickly improve as problems arise. Many projects are focusing on appropriate benchmarking to accurately measure the impacts of operations on physical targets and outcome goals. It is critical to spread the monitoring system to all levels—donor, country, subnational government, and communities using participatory M&E techniques.
- *Focus on capacity building of all stakeholders.* When the Bank began using the community driven approach, most projects focused on the need for capacity at the local level. This often meant a mismatch of expectations and practices between communities and government officials, especially line ministries. The CDD approach means a realignment of the duties from the local to the national level; it does not mean that governments take a hands-off attitude.
- *Plan for a long-term presence.* As stated earlier, while the CDD approach to get water to communities is effective, it is not a short-term approach. Developing and strengthening institutions and organizations is a long-term process that can fail if due attention is not given over the long run. Audits of Bank projects have found few community groups enduring beyond the life of projects when support to organizational capacity ended with the delivery of water service with the completion date of the investment project.
- *Harmonize approaches between the Bank, other donors, and NGOs.* One of the biggest challenges for Bank projects using the CDD approach is to coordinate their activities with other donors and NGOs. Too often, each actor has its own analysis tools, rules for participation, flow of funds, etc., which results in a burdensome and confusing process for communities and local governments. One quick solution is to have each donor or NGO focus on a different geographic area within a country, but that still does not present a clear process for the government to adopt and institutionalize. Harmonization efforts between donors, NGOs, and governments must be seriously addressed.

Conclusions: actions for success

Using the community driven approach to reach specific sector objectives requires a new approach to development that is different from the exclusive focus on government as provider. Achieving sustainability and scale in the community driven approach requires; however, new actions from donors and developing countries; otherwise it will not be sustainable.

For policymakers

- Act as political champions for reform. There will be resistence to change. "No matter how inefficient systems may be, there are always those who benefit from these inefficiencies and who therefore oppose change."[8]
- Combine decentralization of responsibility with decentralization of fiscal resources, so local jurisdictions can feasibly carry out their role.
- Realign incentive structures that reinforce inefficient actions by sector staff and governments.
- Pass legislation that allows communities, NGOs, local government, and the private sector participate equitably in the new service delivery system.
- Policymakers should promote new innovative management approaches and fully adopt the management systems that are best for their country.
- Plan for prolonged effort and gradual change – reform and results will not happen overnight.
- Line ministry staff need training in participatory approaches and demand oriented service provision.
- Empower implementing agencies to coordinate donor activities in a particular sector and/or region. Try to avoid duplication efforts, conflicting approaches, and the administrative burden of too many processes.
- Do not expect immediate results in institutional reform. The community driven approach can represent a rather radical change from the status quo. This is a process that takes time.
- Insist on the creation, and operation, of effective monitoring and evaluation systems, and adjust policy programs based on what is learned in these systems.

For Donors and the Bank

- Allow the client—national to community level— to take the lead establishing the reformed system. If there is no sense of ownership at the local level, sustainability is at risk.
- Harmonize approaches to working with communities and local governments so as not to duplicate efforts or create an administrative burden on the clients. Facilitate the country's leadership in setting fair "rules of the game" and be flexible enough to work within reasonable rules.
- Include working with local governments and line ministries as part of the long-term vision of a community driven program. Bypassing the government with parallel structures can drain any existing capacity from the system and is antithetical to scaling up. The country – the government – must adopt the CDD principles and make them part of their system in order to achieve scale.
- Provide mechanisms and incentives to work across sectors —streamlining operations through mechanisms like multi-sectoral funding windows, instead of supporting separate sectoral programs that can lead to confusion among beneficiaries.
- Build the capacity and understanding of client countries through training, study tours, and effective communication.
- Facilitate capacity building of staff to learn new ways of doing business – emphasize training, documenting experiences and lessons, and formal and informal knowledge exchange across regional and sectoral boundaries within the organization.
- Emphasize the importance of exchanging information and knowledge between organizations to enhance the learning by doing nature of this approach.
- Plan beyond the typical project timespan. Three of the cases discussed above —Albania, Ghana, and Turkey—all discuss projects in sets of two. The typical life of a World Bank project, and that of other donors, is not long enough to achieve sustainable institutions. In the Bank, APLs are being used more often to stretch the intervention to work at the pace of communities and governments.

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Community-based principles for negotiating water rights: some conjectures on assumptions and priorities

Bryan Bruns

Increasing policy support for community-based natural resources management and institutional redesign has been followed by questioning of the feasibility, risks, and results of such approaches. The application of participatory approaches for improving basin-scale water governance would benefit from reconsideration in light of critical analysis of community-based natural resources management and institutional design principles for common-property resource management. Problems of pervasive politics and contextual contingency indicate the need for revising assumptions and expectations. A community perspective on the application of institutional design principles suggests distinct priorities from current policies for improving basin water allocation. Measures to support community involvement in basin water governance, such as legislative reform, legal empowerment, networking, advocacy, participatory planning, technical advice, and facilitation, may be more effective if fitted to community priorities in negotiating rights to water.

Key words: water rights, water allocation institutions, river basin governance, integrated water resources management, community-based natural resources management, institutional design principles

Introduction

As governments and other organizations seek to improve the management of natural resources, participatory and community-based approaches have promised valuable advantages, and so have received increasing support in the policies of national and international agencies. However, experience and analysis indicate that the application of such approaches also faces serious problems and limitations.[1] This paper looks at the relevance of community-based approaches to water rights negotiation in light of critical analysis of community-based natural resources management and institutional design principles for common-property resources. It goes beyond the usual focus on the application of participatory approaches by government agencies in individual communities to suggest some practical implications of a community-oriented perspective on basin-scale water governance.

Rights to water may be negotiated in many contexts,[2] not just within communities, but also between communities and others sharing rivers, aquifers, and other common-pool water resources. Government assistance to develop irrigation and water supply systems may require agreements about how much water will be abstracted, as well as how access to enhanced supplies will be allocated. As competition for water rises along rivers, water users may take part in devising rules for how scarce water will be shared. If government agencies seek to formalize water rights, then quantities and conditions in permits may be negotiated. One source of water to supply the demands of growing cities is by reaching agreements for voluntary transfers from irrigators.

From the perspective of rural communities, negotiating agreements about rights to water may be a necessary condition for aid to improve water supplies for farms and homes. More likely though, is the need to defend access to water against threats from competing users. Drought intensifies conflicts, stimulating short-term and long-term efforts to modify rules and procedures regulating rights to water. Bureaucratic programs, such as basin planning or registration of water rights, may create risks that access will be impaired or lost unless water users act effectively to protect themselves. Legislative changes may imperil the legal status of community water rights. Various strategies may be open to communities,[3] including direct action to acquire more water and restrict others' access; litigating in court; participating in planning and other formal administrative procedures; lobbying to advocate their case to the public and politicians; and trying to reach agreements with other water users and with water management agencies. All these strategies are part of negotiating rules about who gets water.

Organization of the paper

Community-based approaches to natural resources management offer important advantages in the development of basin and sub-basin-scale water allocation institutions, but problems of politics and history should be expected to constrain and complicate their implementation, as outlined in the next section of this paper. In the third section, application of a community perspective to institutional design principles suggests distinct priorities for negotiating water rights. The impact of measures to support communities will depend on how they fit with local circumstances and priorities, as discussed in the fourth section of the paper. The final section of the paper summarizes conjectures about community dynamics and priorities in securing access to water.

Advantages and limitations of community-based approaches

Top-down approaches, emphasizing centralized government authority and control, often encounter limited effectiveness in managing water and other natural resources. There is now increased acceptance and support, for community-based approaches to natural resources management and conservation, at least in policy aspirations, but such approaches are also subject to growing critical scrutiny.[4] Efforts to strengthen community roles and devolve responsibilities to local bodies may be combined or conflated with deconcentration within government agencies.[5] Community-based approaches may be valued for their own sake, as ways to conserve and promote local cooperation and self-governance. Community-based approaches may also be pursued for practical reasons, as an instrument to achieve goals such as increasing equity or water productivity, or simply shifting costs away from government. Many of the advantages of community-based approaches potentially apply in situations where water rights are negotiated as part of basin water management:

- Water users possess detailed local knowledge about how they use water, their needs, and the possible consequences of changes. Community-based approaches cultivate channels through which this information can be considered in making decisions.
- Collective action to manage water weaves water users together in webs of relationships. These relationships build social capital of trust and shared understanding that facilitates cooperation.
- As part of their daily activities, it is often easy for water users to observe whether neighbours are fulfilling their commitments and obligations in using water. They can monitor and detect nearby violations with relatively little time and effort.
- Communities can selectively apply sanctions unavailable through formal institutions. The threat of being shamed or of losing one's reputation as respected and trustworthy may compel compliance. Water users possess strong incentives and willingness to struggle for their access to water.
- Community-based approaches may be able resolve many conflicts at a local level, by those most concerned, with little cost or complication. Such subsidiarity, customized to local circumstances, reduces the transaction costs of coordinating resource use and implementing agreements.
- Involving communities in decisions builds legitimacy and support, reducing risks of rejection and resistance. Participation realizes principles of democracy and empowerment.
- Water management may become more effective when it utilizes the capabilities of users, not just as individuals, but also as communities linked by ongoing relationship, with shared views and common interests that facilitate cooperation.

Community-based approaches have sometimes been advocated and applied with inadequate attention to the variety of people involved in using and managing resources in local areas, and the intricate arrangements through which they compete and cooperate. Simplistic stereotypes of isolated, small, stable, and homogeneous groups sharing the same interests and traditional norms for preserving local resources often fit poorly with the complexity of how diverse local and external actors struggle to make and break rules about exploiting and replenishing resources that may be mobile and interconnect broad areas.[6] The conditions and limitations of community-based approaches need to be considered along with their advantages. Critiques of community-based natural resources management concentrate on core themes of conflict and contextual contingency, or, in simpler terms, politics and history.

Conflict

The concept of community itself is problematic, presuming local solidarity and cooperation that may well be absent or achieved only through substantial effort. Romanticism and ideological aspirations risk obscuring recognition of the tensions, strife, and flaws that characterize collective action past and present. Thus, for example, accounts portraying Balinese subaks and other irrigation communities as highly cohesive encourage exaggerated assumptions about what exists or may be feasible for water user associations.[7] Access to water and other resources is politically contested, so "management" is not a neutral technical exercise in optimizing water productivity, but also an arena for continuing struggle among competing claimants.

Heterogeneity

Assumptions of homogenous actors are invalid, with gender, age, wealth, and other distinctions differentiating communities. Within an irrigation system, head-enders have different interests and options than tail-enders. Theoretical and empirical analysis indicate that heterogeneity may impede or facilitate collective action,[8] but diverse situations of different actors inevitably shape perceptions and actions.

Asymmetry

Differences in knowledge, wealth, and power often (but not always) place communities at a disadvantage in negotiating with outsiders. They often have little room for manoeuvre. If an opportunity exists to negotiate, they may have few alternatives for maintaining or improving their access to resources, leaving them in a weak bargaining position.[9]

Inequity[10]

What helps people who are generally poor by national standards does not necessarily do much for those who are poorest within communities. Within communities, community-based approaches tend to reproduce or even worsen inequalities, although specific targeting measures may help to provide more benefits for those who are poorer. A degree of control by local elites, although not necessarily "capture," is almost inevitable.[11] Poor people, women, ethnic minorities, youths and elderly, and others who are not part of local elites may be left out, neglecting their views and concerns. Biased decisions may reinforce and worsen inequities in access to resources.

Incentives

Participation imposes substantial transactions costs, particularly for the poor, and may not be worthwhile for participants, not just due to problems in organizing collective action but also due to the risks of manipulated and meaningless participation, and policies that transfer responsibility without authority. Furthermore, the incentives of leaders and of ordinary resources users are not necessarily consistent with conservation and sustainable use. In practice, transfer to local control may be almost as prone to biased access and neglect of longer-term sustainability as state control, unless adequately offset by local and external regulation to promote broader societal interests such as legal equality, social equity, and environmental conservation.[12] Rather than simplistic state withdrawal for full local control, the need may be to find an institutional mix that better combines community, market, and state action, as in forms of coproduction, co-management, or regulated autonomy.[13]

Context

The complexity of local resource characteristics, social relationships, external linkages, and other circumstances conditions the impact of interventions, making them prone to fail unless customized to context.[14] Uniform implementation and outcomes are unlikely. Attempts to impose solutions from outside often founder, because they fit poorly with local resource characteristics and institutions,[15] and are resisted as inappropriate and illegitimate. Existing institutional arrangements shape perceptions and the potential for modifying or replacing rules, so that paths for change depend on past and present perceptions and practices that are not easily altered. Institutional rearrangements that occur under exceptional conditions such as outstanding local leaders, strongly integrated communities, abundant funding, and skilled advice are hard to replicate, and prone to revert when the unusual conditions disappear.[16]

These and other factors constrain the applicability of community-based approaches, to natural resources management in general and water allocation in particular. Community-based approaches are not a panacea;

they do not offer a way to escape politics, bypass elites, or safely shortcut to social justice. However, the thrust of most critiques is not to say that community-based management is impossible, but rather to challenge invalid assumptions, oversimplified implementation, and unrealistic expectations. Revised assumptions, based on more realistic expectations, may contribute to developing better approaches.

Applying institutional design principles

An important source of ideas about community-based natural resource management comes from research on community management of common-pool resources such as forests, fisheries, rangeland, and irrigation systems. Proposed principles of institutional design[17] synthesized findings from analysis of long-enduring institutions managing common-property resources, and are summarized in the first column of Table 1. The principles identify means to overcome the "tragedy of the [unmanaged] commons"[18] where individual self-seeking behaviour would lead to degradation and congestion, unless regulated through suitable institutional arrangements. While specific local rules for using a particular resource vary widely, the design principles proposed some general characteristics. Institutions were "crafted" consciously or unconsciously, primarily by resource users acting as insiders, through deliberate design, imitation, trial-and-error learning, improvisation, and other processes. Many of the cases examined by students of common property have been small communities, apparently managing resources through relatively autonomous self-governance, often analytically treated as relatively homogeneous and isolated from external political and economic forces. The principles emphasize "long-enduring" institutions, able to recover from shocks and adapt to changing conditions, especially since there may be no stable ecological equilibrium, nor a "one best way" to manage a resource.[19]

Further analysis has highlighted differentiation within communities, interactions with external social and economic forces, and implications of resources and livelihood strategies that extend beyond small localities.[20] The capacity of government intervention to disrupt local institutions for managing common property resources has been extensively documented, but less has been learned about ways that states can support and sustain local management.[21] Attempts to apply the principles of institutional design to prescriptively determine how institutions for river basin water allocation *must* be designed may fit badly with the complexity of local history and politics.[22] Institutional change may be less a process of careful and deliberate craftsmanship, and more a messy process of institutional *bricolage*, improvisational recombination of available arrangements.[23] Thus, applications on institutional design principles need to take into account the influence of including politics, history and the improvisational and contested ways in which institutions are modified (which may not necessarily draw on a deep folk or scientific knowledge).

Nevertheless, within an appropriately adapted approach, institutional design principles still offer a useful way to outline some of the challenges that face stakeholders concerned with governing shared water resources. While institutional design principles are insufficient by themselves to devise solutions, they provide a framework for analyzing some of the challenges facing communities seeking to negotiate rights to water in contexts of competition with other communities and significant state influence on water governance. Based on experience and analysis of common property resource management in general and water allocation in particular, some preliminary ideas can be proposed about priorities for communities negotiating rights to water.

Table 2. Institutional design principles, issues, and conjectures on community priorities

Principle	Issues	Community priorities
1. Clearly Defined Boundaries The boundaries of the resource system (e.g., irrigation system or fishery) and the individuals or households with rights to harvest resource units are clearly defined	Basins offer clear boundaries, but: Shortages are uncertain and concentrated in particular times and places Administrative boundaries, livelihood activities & other linkages crosscut basins	Coalitions for problemsheds

Principle	Issues	Community priorities
2. Proportional Equivalence between Benefits and Costs Rules specifying the amount of resource products that a user is allocated are related to local conditions and to rules requiring labor, materials, and/or money inputs.	Competing claims to water Infrastructure subsidies distort linkages between receiving water and paying costs	Local water allocation practices accommodated
3. Collective-Choice Arrangements Most individuals affected by harvesting and protection rules are included in the group who can modify these rules.	Representation is required Platforms may be biased, manipulated or lack authority	Representation in decisions, in multiple forums, especially during crises
4. Accountable Monitoring Monitors, who actively audit bio-physical conditions and user behavior, are at least partially accountable to the users and/or are the users themselves.	Agency accountability weak Information technologies make more information available, but generate information overload Complex factors affect water availability	Local and scientific expertise to demystify information
5. Graduated Sanctions Users who violate rules-in-use are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other users, from officials accountable to these users, or from both.	Lack of relationships between distant users impedes trust and informal sanctions Formal sanctions hard to apply	Recourse if rights infringed
6. Low-cost Conflict-Resolution Mechanisms Users and their officials have rapid access to low-cost, local arenas to resolve conflict among users or between users and officials	Courts problematic for resolving water conflicts	Efficient mediation, backed by government authority
7. Minimal Recognition of Rights to Organize The rights of users to devise their own institutions are not challenged by external governmental authorities, and users have long-term tenure rights to the resource	National legal frameworks ignore or disrupt customary water rights and organizations Insecure tenure	Customary water rights recognized
8. Nested Enterprises (For resources that are parts of larger systems) Appropriation, provision, monitoring, enforcement, conflict resolution, and governance activities are organized in multiple layers of nested enterprises.	Participation is costly Multiple government units and agencies	Community autonomy Strategic alliances

Sources: The first column repeats "design principles derived from studies of long-enduring institutions for governing sustainable resources," as presented in Andries, Jannsen and Ostrom 2003, which are based on Ostrom (1990: 90). For column two, see the paper, and also Cleaver and Franks 2003 and Ravnborg 2003.

Clearly defined boundaries

Watersheds delimit catchments within which streams merge to form rivers, delineating sub-basins and basins that appear to clearly define boundaries for water management. As water becomes scarcer in a basin, and augmentation of supplies becomes more difficult, the scope of interaction and competition between users increases, increasing the need for and potential benefits from coordination among those sharing a common resource. However, a series of other factors blur the clarity of basin boundaries.[24] Shortages become severe at particular times and places, affecting different water users differently. Administrative jurisdictions such as districts and provinces crosscut basins. Resource users engage in activities inside and outside of basins. Land-

use changes that affect water flows engage different sets of people and agencies. Health agencies have responsibilities regarding about water quality, while environmental agencies and groups pursue their agendas. Groundwater basins overlap surface basins. Irrigators steering water around hillsides and cities reaching out to augment their water supplies shift water between different sub-basins and basins. The physical linkages within a basin offer a foundation for management, but social and economic linkages follow different patterns, raising the transaction costs of coordination. Conceptual frameworks for integrated water resources management (IWRM)[25] offer the appealing prospect of coordinating solutions to many of these complexities but may presume or be interpreted to require ambitious projects for design and implementation of elaborate new institutional arrangements. From a community perspective, if negotiation is costly, it may be most important to engage those most affected by and involved in causing a particular problem. Thus, the most relevant scope may cover a *problemshed,*[26] rather than necessarily including an entire river basin or comprehensively integrating water resources management. Rather than clearly defined boundaries and complete membership, the immediate challenge from a community perspective may be to form an effective coalition among a fuzzy set of people with widely differing stakes in a problemshed.

Proportionality between costs and benefits

Within communities, access to shared water infrastructure for household or irrigation use is almost always linked to obligations to contribute to investment or at least maintenance. However, subsidies for major water infrastructure encourage expectations of receiving benefits without paying costs. Users are likely to oppose formalization of water rights if it is seen as primarily a pretext to impose new charges. Few governments have enough political power to establish themselves as waterlords extracting marginal cost prices for water. Shifting to volumetric water allocation of surface water offers theoretical benefits, and practical problems in measurement and control that grow larger as the volumes involved get smaller. From a community perspective, arrangements that accommodate existing local practices, such as proportional sharing of shortages and measurement by time rather than volume, are likely to be preferable.

Collective-choice arrangements

The scale of basins prevents direct participation of all stakeholders, but representation risks reinforcing biases.[27] The danger that participatory platforms[28] are co-opted, manipulated, and lack meaningful decisionmaking power makes it wiser to take a selective and strategic approach to participation, deciding whether or how to "come to the table," and retaining options to work through multiple forums.[29] Representation is most crucial during crises, such as drought, when modifications in water allocation rules receive lots of attention.

Accountable monitoring

Communities lack information about conditions elsewhere in a basin. Agencies with monopoly control over infrastructure may escape accountability, and tend to develop information systems that serve their internal purposes. Advances in information technology promise abundant information, and accompanying problems of information overload and difficulty in understanding the complex impact of land-use changes, return flows and other factors on streamflows. Local and outside experts can help demystify knowledge, improving the capacity of communities to make and monitor agreements.

Graduated sanctions and conflict resolution mechanisms

Rights mean little unless there are ways to enforce them when they are infringed. Lack of social ties between distant communities limits the influence of sanctions based on reputation and repeated interaction, as does the asymmetry of water flowing downhill. A framework of government authority can enable strangers to contract credible commitments,[30] and this can include agreements about government-recognized water rights. However, legal proceedings that are prolonged, costly, hard to enforce, or construed in ways that fit poorly with the practical needs of water management make courts problematic for resolving conflicts, although they may offer useful bargaining leverage.[31] If effective conflict resolution mechanisms and sanctions are absent, then problems such as unchecked upstream abstraction and mining of aquifers may be inevitable.[32] Conditions in many basins mean that having any form of effective recourse is a higher priority for communities than minimizing transaction costs or carefully calibrating sanctions. In the absence of effective alternatives, mediation by government authorities plays a central role in dealing with disputes over water.

Rights to organize

Formalization of water user associations in government-driven projects sometimes does more to disrupt than to sustain local collective action in irrigation.[33] Constitutional and legislative provisions asserting government

sovereignty over natural resources, including water, are often construed to ignore or deny community rights, although advocates can develop other legal interpretations that support community-based property rights, (including both common and individual rights derived from community rights).[34] Legal mechanisms are available by which customary rights can be recognized, with legal standing, without requiring formal registration. Thus, for communities, finding ways to assert customary community rights is likely to be more important than registration of a government-prescribed organization or formalization of water rights.

Nested organizations

The logical structure of basins, sub-basins, and localities invites multiple layers of organization, but makes no guarantee that such a hierarchy will be effective, worthwhile or even feasible.[35] Water rights systems may be more successful if they avoid government micromanagement of water allocation within communities.[36] Legal frameworks can enable formation of special districts, with the necessary authority to manage water and mobilize funds, while leaving it up to water users initiate polycentric organizations on scales that fit their needs and capabilities.[37] Even if local government jurisdictions mismatch hydraulic boundaries, it may be hard to put new or modified rules into practice without their support. From a community perspective, local autonomy and external alliances are likely to be more important than establishing elaborately nested organizations.

If principles for institutional design are interpreted as necessary conditions for coordinating water use within basins, then the limiting and complicating conditions outlined above might be enough to simply conclude that participatory governance will be impossible. Even if institutional design principles are interpreted more modestly, as desirable conditions that favour good management, they still highlight the many challenges facing basin water management. In most cases, especially in the short-term, it is unlikely that all or even many of the principles will be completely fulfilled. The question then becomes not one of prescriptively designing an ideal institution, but of what communities, agencies, and other actors in water governance, improvising institutional design as insiders, can accomplish under the conditions that actually prevail.

Aiding community negotiation

Water users who want to negotiate water rights may choose various means to pursue their interests. They may study relevant statutes and regulations, and gather other information on their own about water problems and potential solutions. They may organize themselves, working through existing local organizations or forming new organizations or coalitions. They may share experiences and coordinate with other groups, through informal contacts and more structured activities such as conferences or workshops. They may participate in planning activities related to water allocation. They may advocate their interests through the media or by directly lobbying politicians and agency officials. They may establish forums covering broader areas such as a basin or sub-basin and develop such organizations to provide effective platforms for negotiation. Complementing the means available to water users are various measures available to improve community participation in basin governance.

Legislative reform

Legal frameworks empower if they recognize rights of existing user communities and enable legal recourse if rights are harmed. Obtaining legal status for user organizations may be useful in providing legal standing to sue in court or to participate in administrative hearings. More generally, transparency, accountability, and other characteristics of the rule of law in good governance provide conditions that enable stakeholders to act more effectively to protect their interests. From a community perspective, one major problem is that legislative reforms take a long time. Stronger rights to resources may be very valuable over the long term, not just for encouraging investment but the variety of ways they can help people secure and improve their livelihoods.[38] Passage of new legislation requires constructing political coalitions, institutional bargaining that is often contingent on propitious circumstances, which may be more a matter of luck than planning. If reforms are enacted, they may make a big difference, or not. Even after legislation is passed, implementing regulations are often needed. Government agencies may or may not be active about applying what has been put into law. If ambiguities or conflicts exist with other legislation, then legal rulings or amendments may be needed. However, even with carefully-drafted legislation, if courts are unable or unwilling to enforce legislation then regulation of social and environmental externalities is difficult.[39] For communities, minor modifications of

existing regulations and long-term rights to resources may be more important than the medium-term legislative reforms that attract much attention from researchers, policy analysts, and reformers.

Legal empowerment

Legal aid, legal education, and related approaches, sometimes referred to as legal literacy or legal empowerment, cover a range of activities to improve the capacity of people to understand and use legal systems.[40] This includes opportunities for creative use and reinterpretation of existing national and international law. While conventional "rule of law" efforts to develop good governance tend to focus on government officials, legal empowerment approaches emphasize improving the capacity of communities to know and use the law. Local people who develop some expertise can play crucial roles as paralegals. Legal aid may be provided by non-government organizations, law schools, and government programs.[41] Habits, concepts, and prejudices sometimes lead disputants to behave in ways that may not be conducive to reaching agreement. Specific techniques, such as interest-based negotiation, and assistance, from facilitators or mediators, may play a valuable role.

For communities whose water rights are under immediate threat, legal empowerment measures offer some of the most promising opportunities. A first challenge is to enable communities to be able to link with sources of assistance. Media publicity and networking, for example through civic organizations, should be able to play a key role. The second challenge, and likely the main constraint, is the availability of resources, such as funds and skilled lawyers. Governments may not be particularly enthusiastic about providing resources to those who want to challenge government actions. Legal empowerment requires detailed work on the ground, much less exciting and much more prone to failure than advocacy. In practice, it requires lots of compromise, deciding which struggles to prioritize, which goals seem achievable, working with government officials, and seeing what can be done within the constraints of an existing system. What may be most relevant for communities is to have knowledgeable local people and outside counsellors who know the existing legal framework, and what bases it may offer for communities for securing water rights.

Networking

Networking between communities cross-fertilizes experiences and coordinates joint efforts. As discussed earlier, one of the main challenges for water management is the scale of conflicts that can extend across broad areas. Local people may be able to make use of existing linkages with other areas, through relatives and friends living elsewhere, formal organizations, political contacts, and other contacts. Outsiders may be in a good position to foster linkages between distant groups with few existing connections. An outside organization may be able to convene a workshop, seminar, or other activity that brings people together across a basin or sub-basin. However, networking for its own sake risks dissipating time and energy on prolonged discussion. Reforms that offer a voice in consultation processes, but not genuine power, e.g. representation on advisory basin committees, may be useful, or may consume effort out of proportion to outcomes, especially if they require high costs in time and money to congregate dispersed networks of participants. Networks might be most useful when engaged for specific objectives such as sharing solutions and lobbying government agencies and legislatures.

Advocacy

Advocacy draws attention to community concerns, concepts, and roles in managing water. Outside groups may help make advocacy more effective by providing links with reporters, forums to discuss issues and strengthening capability to prepare and deliver messages. If access can be obtained to media or decisionmakers, then advocacy may be able to mobilize allies and reframe issues in ways that favour community concerns. Advocates may play influential roles in policy debates at the national and international level. Advocates concerned about adverse impacts on communities have had successes in blocking passage of new water laws in countries such as Thailand, Sri Lanka, Peru, and Ecuador.[42] In the case of Indonesia's recent water law, key provisions regarding water rights were revised in hopes of better protecting poor farmers' access to water, in response to concerns of NGOs, academics, and some parliamentarians. However, communities themselves cannot earn a living from advocacy, and rather than endless ideological struggle are likely to prefer pragmatic engagement that expands meaningful opportunities. Time scales for local advocacy may differ from those of organizations that would like to aid them. On the one hand, communities want pragmatic solutions to immediate problems, and so may have less interest in medium-term struggle for policy reform and intricate

basin planning. On the other hand, communities may pursue in their efforts over decades or even centuries outliving opponents, overcoming temporary setbacks, and applying patient persistence to achieve their local objectives.[43]

Participatory planning

Opportunities can be opened for stakeholders to take part in preventing and resolving problems, increasing input from stakeholders, promoting dialogue, facilitating joint problem solving, and structuring processes through which decisions can be made jointly with user representatives. For water rights, this may apply across a range of activities from managing a particular crisis, seasonal planning for water allocation during periods of scarcity to long-term basin planning. A participation audit could assist an agency to assess the ways it allows and support participation, and whether stronger, more empowering participation may provide greater incentives for stakeholders. Stakeholders may not know about opportunities for participation, and even when they know, may be sceptical about what potential there is for genuine influence. Signs of credibility, such as participation of senior agency staff and honesty about how final decisions will be made may provide important signals. Methods for reducing the transaction cost of participation, particularly the time required, can make a difference, for example providing information, accepting input and engaging in dialogue through multiple forms, rather than restricting interaction to stylized approaches such as conventional public hearings. Many efforts labelled as participation or decentralization fail to convey genuine power, while others that do transfer power, money, and other resources fail to consider the risks of local abuse, inequities, overexploitation of resources and other problems. A key question is "who decides?" Empowerment is far more meaningful if both sides must agree, or when decisions are delegated, authority transferred, or local institutions enabled to make decisions on their own, while governments and civil society also act to provide appropriate regulatory checks and balances.

Technical advice

Training enriches skills, such as in techniques for negotiation and dispute resolution. Technical advice provides relevant information. Lack of technical information is often a key constraint. For example, technical analysis can help to clarify how much water is available and how it is being used. This may help correct misconceptions and focus attention more precisely on feasible solutions. Participatory rural appraisal, participatory geographic information systems, scenario models and related methods offer a variety of techniques for blending local and outside knowledge, in ways that can be relatively fruitful and efficient in terms of local people's time. Information technologies such as remote sensing, databases, modelling, e-mail, and websites are reducing the costs of monitoring, but still face limitation including limited funding for acquiring data, scientific uncertainty, and information overload for those who want to use such data. Information is useless if it seems irrelevant, incomprehensible, or confusing. Most people are busy with their lives and are not interested in becoming technical experts. Specific studies, focused on problems perceived as important and framed in ways that reflect community concerns are much more likely to be worthwhile than more academic and general research. For a community, an attractive option may be to have their own expert, to have the resources to at least partially offset the weight of expertise that government agencies can mobilize.

Platforms

Facilitation assists formation of forums or platforms for negotiation. Availability of particular forums or platforms[44] can make negotiation possible, providing focused arenas within which problems can be discussed, alternatives considered, and agreements formulated. This may occur as part of other activities, as discussed earlier in terms of participatory planning, or through establishment of special-purpose organizations, such as alliances of concerned groups, basin committees or water councils. Groups can be brought together to discuss issues and consider establishing arrangements for cooperation. Facilitators may help to convene stakeholders and strengthen organizations. However, ostensibly neutral processes convening stakeholders to create consensus based on shared information and improved communication risk perpetuating and worsening existing differentials in power, wealth, and status. Outsiders intending to preferentially aid particular groups, e.g. poor people, women, ethnic minorities, or other disadvantages groups may want to take a careful and strategic approach to the development of platforms, as may communities themselves.[45] Such a strategic approach may involve selective alliances, controlling release of information about community conditions and objectives, waging struggles in multiple forums, and pragmatic compromises conceived of as only temporary concessions during continuing contests over rights and resources.

Concluding conjectures

Critical analysis of community-based natural resources management and institutional design principles provides a basis for proposing some tentative ideas, as working hypotheses or prior conjectures,[46] about how communities may be expected to act to secure rights to water. Such conjectures would need further adjustment to apply to specific cases where communities are involved in basin water governance, but may offer a useful starting point for discussion, research, or practical application. Accurate assumptions and realistic expectations about community priorities could reduce the risks of waste, disruption, and disappointment due to inappropriate interventions.

Critiques of community-based natural resources management and institutional design principles clarify some of the challenges and constraints to interventions intended to influence change in water allocation institutions. The scale of competition over water makes negotiation of credible commitments contingent on government sanctions. Coalitions and compromises to forge cooperation among heterogeneous users may reflect and amplify differences due to wealth, power, gender, ethnicity, and other characteristics, unless there are particular conditions and arrangements that promote equity. Political contests over claims to water, budgets, and related resources often impel participatory reforms more towards allowing voice in agency decisions than towards partnership or authoritative empowerment for communities.

Principles for institutional design are more relevant if suitably adapted to the context of community perceptions and practical priorities. Communities may be more concerned about *problemsheds* than clearly defined catchments, *protecting local practices* more than precise proportionality of rights, costs, and benefits, *representation during crises* more than participation in deliberative platforms, *effective recourse* to redress harm to rights more than carefully calibrated sanctions, *administrative mediation* more than consensus or courts, *recognition of customary rights* more than formal registration; and local *autonomy and strategic coalitions* with local governments and other allies more than elaboration of nested hydraulic enterprises.

A community perspective on water governance suggests that the dynamics of community collective action to secure water rights are likely to be:

- Primarily *defensive*, concerned with protecting against threats to existing claims,
- Constructed of heterogeneous *coalitions*, within and between communities,
- Employing *mixed strategies* using multiple claims and forums, and
- *Opportunistically* improvised in response to particular crises.

Therefore, interventions aimed at optimizing and reallocating water use, assuming shared interests, attempting to monopolize water allocation decisions in a single forum, and pursuing comprehensive, anticipatory planning, i.e. ambitious projects for basin master planning, and integrated water resource management, may fit poorly with the dynamics of community collective action, and so be prone to being ignored, resisted, and rejected. More modest institutional modifications, better fitted to the dynamics of community collective action, that help secure rights and resolve urgent crises, may meet greater success.

Interventions in basin governance intended to support community-based natural resources management and strengthen local organizations may have better prospects if carefully fitted to the contours of institutional landscapes and oriented towards promising pathways for institutional transformation. From a community perspective, short-term *regulatory adjustments* that solve immediate problems, and long-term *rights to resources*, may be more important than medium-term reforms to build basin management organizations. Targeted training for local *paralegals* and access to *legal aid* may do more to make laws effective than extensive broadcasts, brochures, and lectures. Facilitating a few *strategic links* to outside groups and agencies may do much more for community capacity than intensive internal organizational development. Lobbying in opposition to changes that threaten to further disadvantage people may be helpful, but advocacy that pragmatically engages meaningful opportunities for people to sustainably improve their lives may do even more for them. Participatory planning that honestly promises influence over decisions creates credibility, but *empowerment* that establishes partnerships, delegates decisions, transfers authority, or enables autonomy, within appropriate regulatory checks and balances, may do even more to improve basin resource governance.

Information technologies are expanding availability of information, but to make abundant information useful communities need access to *appropriate expertise* to apply knowledge to serve their objectives. Platforms may facilitate formation of acceptable agreements, but be only part of developing a *portfolio of community strategies* to negotiate rights to water.

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Notes

[1] See, for example, Agrawal and Clark 2001, Knox and Meinzen-Dick 2001, Young 2001, Ribot 2002, Agrawal 2003, Mosse 2003, Cleaver and Franks 2003. Sengupta 2004, Shah 2005, Mansuri and Rao 2005
[2] Bruns and Meinzen-Dick 2000, 2001.
[3] Danvers compares strategies of litigation, participation in project planning, and negotiation used by three American Indian groups in New Mexico, noting the tendency of strategies to converge.
[4] See, among others, Agrawal and Gibson 2001 for a review of community-based conservation, Agrawal 2003 for a recent review of research on common-pool resource management, and Mansuri and Rao 2005for a recent synthesis of peer-reviewed studies of community-based and community-driven development and related approaches.
[5] Knox and Meinzen-Dick 2001, Mosse 2003, Ribot 2003
[6] Agrawal and Gibson 2001
[7] For a nuanced empirical and theoretical discussion of conflicts in Balinese subaks see Spiertz 2000.
[8] Mansuri and Rao 2005, see also Olson 1971.
[9] Fisher and Ury (1991) define power in negotiation operationally in terms of the "best alternative to a negotiated agreement" (BATNA), the outcome available if agreement is not reached.
[10] Mansuri and Rao 2005
[11] Mansuri and Rao (2005) note that elite control may be almost inevitable. Like most of the literature, the notion of "capture" is used in a rather unexamined way. Capture is assumed to be undesirable and detrimental, and not clearly distinguished from other forms of local political support or "buy-in." There literature does not apply insights from the study of regulated industries that capture by regulated interests may be a less important phenomenon than the tendency of new institutions to pursue their bureaucratic interests in expanding budget, staff, and authority ("turf). Analysis of elite roles would also benefit from more attention to competition between elites and "circulation of elites."
[12] Ribot 2001.
[13] For coproduction, see Ostrom 1997 and Lam 1997. Berkes (1994) discusses co-management. For a review of various ladders, levels and spectra of participation, including regulated autonomy, see Bruns 2003.
[14] Mansuri and Rao 2005.
[15] For institutional "fit," see Young 2002.
[16] Shah 2005, see also Bruns 1992.
[17] E. Ostrom 1990.
[18] Hardin's 1998 commentary corrected his earlier (1968) article to clarify that the tragedy is a problem for "unmanaged" commons, those without institutional arrangements (state or community) to regulate access.
[19] Ostrom 1999, Anderies, Janssen, and Ostrom 2003.
[20] Agrawal 2003.
[21] Sengupta 2004.
[22] Cleaver and Franks 2003. Ravnborg 2003 (Cited with permission).
[23] Cleaver and Franks (2003) cf Levi-Strauss' original discussion of bricolage (1966 [1962]) available at http://varenne.tc.columbia.edu/bib/info/levstcld066savamind.html.

[24] For example, see Cleaver and Franks 2003.
[25] Agarwal et al. 2000 and Rodgers and Hall 2000 describe IWRM.
[26] Halaele and Knesse 1973
[27] Wester 2003
[28] Steins and Edwards 1998. Boelens et al. 2002.
[29] Edmunds and Wollenberg 2001 critique the neutrality and inclusiveness of forums. For challenges in transferring meaningful authority over irrigation management see Vermillion 2001 and Bruns 2003. "Shopping" among forums need not require choosing only one, instead a disputant may employ a portfolio (or basket) of forums.
[30] North 1990.
[31] See, for example, Sengupta 2002.
[32] See Shah 2005, Shah et al. 2001.
[33] Bruns 1992, Mosse 2003, Shah 2004
[34] Lynch 1998
[35] Ravnborg 2003.
[36] Guillet 1998.
[37] Blomquist 1992. For polycentric governance, see V. Ostrom 1997. Applications to water resources include E. Ostrom 1990, 1992, Blomquist 1992 and Tan-Kim-Yong et al. 2005.
[38] de Soto 2000.
[39] Bauer 2004.
[40] Lynch 1998, Harwell and Lynch 2002.
[41] See, for example, NNMLS 2000.
[42] Gunatilake and Gopalakrishnan 2002, Trawick 2003, Bauer 2004:146.
[43] Maass and Anderson 1978.
[44] Steins and Edwards 1998, Boelens 2002.
[45] Edmunds and Wollenberg 2001
[46] The ideas developed informally here are roughly analogous to Bayesian priors in statistics, identifying the most likely expectation of outcomes based on the best currently available knowledge. In particular, rather than naively expecting an equal (or even pro-poor) per capita distribution of benefits, it seems more likely to expect that outcomes will reproduce existing distributions of power and benefits (or skew them even more). The more interesting question is to what extent outcomes can be affected by specific measures for targeting, empowerment, advocacy, etc.

International workshop on '*African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa*', 26-28 January 2005, Johannesburg, South Africa

Managing the River Njoro Watershed, Kenya: Conflicting laws, policies, and community priorities

Francis K. Lelo, Wanjiku Chiuri, and Marion W. Jenkins

This paper reports on an experimental process underway in the River Njoro Watershed in Kenya to engage riparian communities, other local stakeholders, and government policy-makers in a dialogue to develop a riparian management plan. The process is part of the Sustainable Management of Watersheds Project (SUMAWA-CRSP), a multidisciplinary applied research effort established in 2002. The River Njoro's riparian zone is a common pool resource that supports critical downstream watershed services and provides valued resources to its poorer communities. However, its survival is threatened by the incompatibility between communal regulatory mechanisms, tribal norms and mechanisms of statutory enforcement, and between national laws and institutional arrangements in Kenya. The ensuing free access lawless mentality has lead to resource degradation and subsequent decline in riparian services such as water quality and flood protection. A contributing cause is the absence of any institutional structure to harmonize conflicting government laws and policies on land, water, and forest resources on the ground.

Keywords: riparian zone, watershed management, laws and policies, natural resource use, Kenya

Introduction

The River Njoro Watershed provides an on-going case study of the ecological degradation of the riparian zone that occurs when government policies and laws conflict with local people's traditions and cultural practices. Typical of the semi-arid basins in the Rift Valley of Kenya, this watershed has been undergoing a new phase of rapid land use change in the uplands portion of the watershed, and continued significant growth in both rural and urban populations and associated economic activities. Considerable negative environmental impacts are occurring, in particular to the quality and quantity of river water (Shivoga et al. 2002). Increased erosion, nutrient and sediment loadings, and human and animal pollution, along with damage to the integrity of the riparian corridor and changes in the hydrologic regime of the river have been observed.

In 2002 a multidisciplinary international applied research effort was established in response to water management concerns in the River Njoro Watershed and other regional watersheds in Kenya. The Sustainable Management of Watersheds Collaborative Research Support Project (SUMAWA-CRSP) brings together Kenyan and US scientists and engineers, and Kenyan public agency staff to demonstrate improved and integrated management of water and environmental resources in the Njoro Watershed through local stakeholder participation and action supported by scientific information and analyses. Its objective is to with stakeholders in order to reverse negative trends and enhance the integrity and sustainability of water and environmental resources in the Njoro watershed, while also addressing critical poverty issues. In the first phase of public participation, a bottom-up approach has been used to engage local riparian communities in a participatory problem analysis and solution opportunity appraisal process. An emerging priority for action has been the protection and management of the riparian zone. The community problem analyses revealed how a free access mentality has developed in regards to the riparian zone. This state of affairs can be traced in part to the lack of enforcement of long-standing riparian conservation rules and confusion arising from more recent conflicting government land, forest, and water laws and policies. As a consequence, riparian degradation along the river has increased the risks of downstream flooding and contributed to declining water quality. Emerging from the analysis is a need for an institutional structure to bring together government agencies that make and implement laws and policies on land, water, and forest resources to harmonize conflicting regulations on the ground. The future well-being of the riparian zone will be closely linked to how well cooperation can be established between

national and regional policy-makers, on the-one-hand, and local community leaders on the other to define a coherent management framework and enforcement mechanisms.

SUMAWA is now tackling this challenge in the second phase of the public participation process through a series of tiered workshops to set up a structure for government-community dialogue and cooperation. The preliminary findings from the on-going research in the River Njoro Watershed point to the need to develop strategies through this dialogue process that restore and enhance the integrity of the riparian zone, while at the same time meeting the aspirations of different population groups residing along the river.

Background

The River Njoro is located in Nakuru District in the centre of Rift Valley Province in Kenya. The river is approximately 60 kilometers (km) in length. It emanates from the eastern slopes of the Mau Escarpment at about 3000 meters and terminates in Lake Nakuru at about 1750 meters (Figure 1). The watershed, of about 280 km squared, has over 300,000 people and includes the urban centers of Njoro Town (~ 30,000) and much of Nakuru Municipality (~240,000). On its journey from its source in the Eastern Mau Escarpment, the river cuts across several land uses and communities with diverse cultural orientations. The Njoro Watershed constitutes a critical water source for Lake Nakuru, a large shallow saline lake designated a Ramsar wetlands site of international importance. During the last 20 years the region has undergone rapid land use change and population growth with associated negative impacts to the water resources, public health, the local economy and livelihood systems.

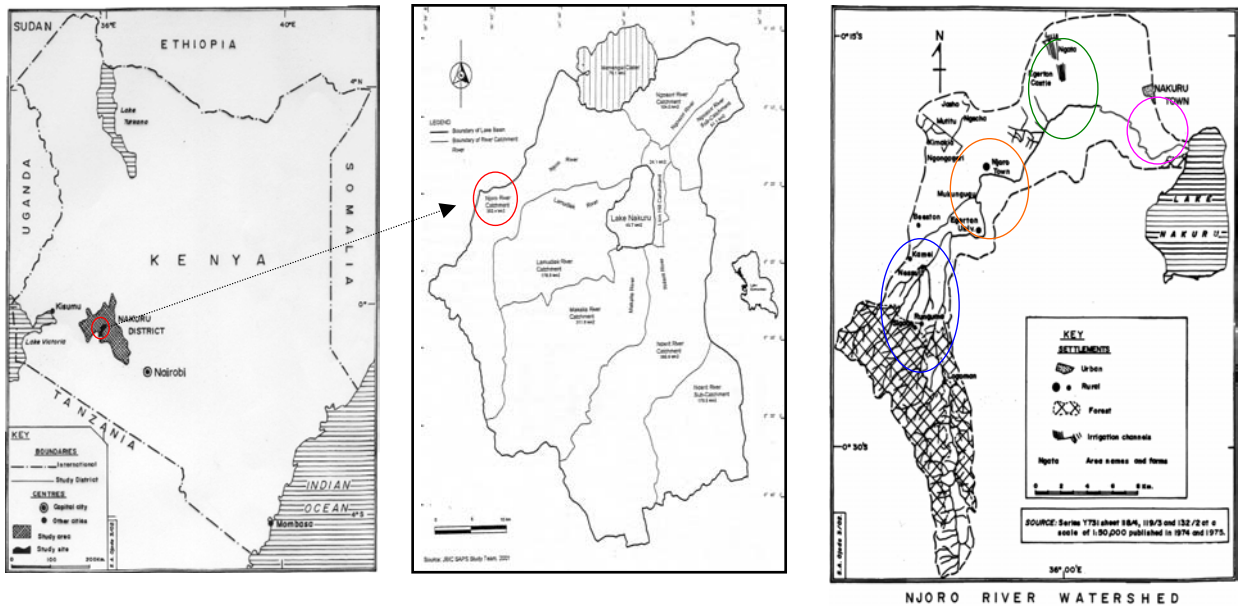

Figure 1. Location of River Njoro Watershed in Nakuru District (a), in Lake Nakuru Basin (b), and communities in the watershed (c): Nessuit – blue, Njoro Town – orange, Ngata –Green, Baruti – pink

At least four land uses are significant, which have a bearing on the riparian vegetation. Starting at the top of the watershed, the upper zone is predominantly forested with indigenous plant species. This opens to new settlements on recently felled plantation forests, characterized by temporary structures and small scale subsistence farms (Photograph 1). This landscape is still littered with tree stumps. Most of the new settlers were originally pastoralists but are now practicing agro-pastoralists. In addition to farming, they are using

cleared forest areas for livestock, mainly cattle, sheep and donkeys. This gives way to a third zone, of older and more permanently settled small and large-scale farms. Besides subsistence farming, these farmers also keep dairy animals and grow wheat as a cash crop. Smaller farms are interspersed with a few remaining large scale farms from the colonial era, including Egerton University's commercial farm. Urban centers are the fourth type of land use, mainly in the middle and lower zone, including Egerton University Campus, Njoro Township, and large parts of Nakuru Municipality. These zones consist of more densely populated settlements, industries, commercial activity, and the accompanying concentrated waste disposal problems. At the end of the watershed is Lake Nakuru National Park (LNNP) which encloses Lake Nakuru. The park is Kenya's second most internationally visited wildlife park, due in part to Lake Nakuru's unique bird population. In addition to the birds, other wild animals abound and their presence is dependent on the continued flow of the River Njoro.

Source: Miller (2002)

Photograph 1. New settlement next to indigenous forest in the upper River Njoro Watershed, Kenya.

Statutory versus community resource management

Riparian zone definitions and enforcement

In Kenya, rivers are public resources and accessible to anybody at anytime. The Land Act (Cap 307, section 13 and 3) states that the riparian zone, including the vegetation which grows along the river, is government property (Jackson 1988). The official size of the strip of government-owned riparian land is marred in confusion. It is not standard and varies according to the width of the river, according to a non-conventional calculation whereby the riparian area on each side of the river is to be set equal to two times the width of the river. By law the two pieces of land on both sides of the river, referred to as the riparian zone, are to be left intact. However, in most cases due to the enormity of the task of definition and enforcement, management of the riparian zone is left to the interpretation of the individuals owning land adjacent to the river. In practice, this leads to many land owners clearing the vegetation and using the land right up to the edge of the river. Whereas the law is clear about the conservation of riparian vegetation, its interpretation and lack of enforcement leaves room for individuals to flout it. The enforcement of riparian zone conservation is solely the responsibility of government agents, represented by local chiefs, the water bailiff, local agricultural and water officers, foresters and more recently environment officers. As these officers cannot be everywhere all the time along the river, the fate of riparian resources lies ultimately with the local communities.

Pluralistic customary and stakeholder views on resource management

The communities living along River Njoro belong to different ethnic groups and therefore have different cultural backgrounds. They also have different histories of settlement in the watershed. Starting at the top, in the upper indigenous forested zone are Ogiek, who are traditionally hunters and gatherers but have recently begun to settle the land adjacent to forests. Newly arrived and settled Kalenjin groups are mixing with Ogiek in the upper two zones. These give way to mixture of older Kikuyu and Kalenjin residents. In the lower zone and before entering the lake are mixed groups of people from different parts of Kenya, some living in urban centers and owning farms along the River Njoro. Most of them came in the first wave of rural settlement prompted by the post-independence land reform starting in mid-1960. Each of these groups has diverse livelihood interests and activities and a different historical attachment to the land. Some are more interested in pastoralism, while others are a mixture of agriculture and livestock, while others have predominantly urban lifestyles. Other stakeholders such as Kenya Wildlife Service, World Wide Fund for Nature, Tourist Lodge owners etc. are interested in nature conservation and have little interest in what goes on outside the boundaries of Lake Nakuru National Park except as it affects the health of the park's wildlife. However in all these cases, either directly or indirectly, they depend on the natural resource base, in particular, on water and riparian resources in the public domain in the River Njoro watershed. Each of these stakeholders applies their own cultural values and experiences in the way they view River Njoro water and riparian resources.

Source: Krupnik (2003)

Photograph 2. Riparian destruction along the upper River Njoro, Kenya

Resource conservation in conflict with customary traditions

Kenya's nature conservation areas are modeled on American system. In American parks one is not permitted to take anything away or leave anything behind inside the park. This contrasts with the African conservation ethic. In traditional African culture there was no demarcation or separation of people from nature; nature and people were one and the same. Thus, local people complain when they are stopped from grazing their livestock inside nature conservation areas, and prohibited from entering these facilities on foot. The facilities are said to be too dangerous, and yet not long ago grandparents used to walk barefooted in the same places. Nature conservation areas have become the preserve of the tourists and the minority middle class who can afford gate fees and own cars. This has not helped, but fueled the local people's negative attitudes towards protected areas in general, including forests and riparian resources. This attitude is attested by the fact that those who cut down trees and destroy facilities in protected areas live safely and securely among their fellow villagers, where nobody is willing to give adverse evidence against them. It is as if a silent protest has been declared. To most local people, government conservation regulations are oppressive.

Many sections of the riparian areas of the River Njoro are devoid of vegetation (Photograph 2). Farmers adjacent to the river and outsiders cut down trees and overgraze the area, as they claim the resources are free for all. They do this because they know that enforcing authorities (chiefs and government staff) are too over stretched to note what is happening or fail to follow-through with sanctions. The conflict over the use of riparian resources in River Njoro provides a microcosm of the land management crisis facing Kenya: a case of the existence of laws that are not supported by local people and their institutions.

The British colonial systems protected the forests and riparian zones through coercion. Forest guards and chiefs were given authority to punish those who encroached. Since independence, the same colonial rules and enforcement structures exist but in the background of self governance, while the guards and chiefs no longer have express authority to punish offenders. In the midst of this confusion, the government is equally to blame for giving mixed signals to the communities living adjustment to forests and riparian zones. Whereas it is the government policy to protect these zones, starting in the early 1990s, large sections of protected national forest areas were declassified and allocated to private individuals and groups for political expedience.

Correcting the wrong

Initial results from the Sustainable Management of Watersheds Project

The SUMAWA-CRSP project has started working with stakeholders in the Njoro Watershed, from the agro-pastoralists in the upper part of the watershed; the large scale and small scale farmers, and town dwellers and Egerton University in the middle; and manufacturers and slum dwellers in Nakuru town suburb, on a variety of water and environmental resource management issues in the Njoro watershed with attention to critical poverty issues. The first stage of the research activities focused on identifying and understanding the perceptions, problems and priorities of the different riparian communities in relation to surface water and conditions in the riparian corridor (Jenkins et al. 2004). Tables 1 and 2 summarize results from the Participatory Rural Appraisal (PRA) assessments in four communities along the River Njoro.

Riparian resource use patterns in the Njoro Watershed

Table 1 documents the involvement of different groups and communities in water and riparian zone resource use and decision-making. The findings indicate that women have key responsibility and decision-making roles for domestic water supply from the river and firewood collection along the banks, men for livestock watering and grazing decisions (esp. large livestock such as cattle), and small-scale irrigation, and young men for water extraction, fodder collection, sand and other resource extraction activities from within the riparian zone for cash sales or hired work. Men and women both are involved in timber/wood gathering for house building, and in maize cultivation decisions, while men alone are involved in wheat cultivation. All of these resource extraction activities occur within the riparian zone and often provide critical livelihood strategies for very poor households.

The assessment information shows that exploitation of water, river bed materials, and vegetation in the riparian zone (medicinal herbs, firewood and fodder) by people from outside each community is significant, especially in the middle and lower parts of the watershed. This confirms the understanding that a river is a free access resource (Photograph 3). In the absence of any recognized institutional framework for managing such a resource it is conceivable that in the long run it could lead to Garren Hardin's (1968) tragedy of the commons scenario. This fate seems to be have already befallen River Njoro Riparian resources in critical parts of the watershed, and threatens the newly opened upper catchment settlement areas.

When River Njoro dried up in 1984 the locals assumed it to be a rare case and that the situation would revert to normal. However, since then the river has become increasingly seasonal and flashy, and at times fails to reach Lake Nakuru. Studies suggest a possible correlation between rapid deforestation and new settlement in the upper zone starting in the early 1990's and the decline both in water quality and stream flow during dry periods (Shivoga et al. 2003; Baldyga et al. 2004). The SUMAWA team has several scientific investigations underway to test the validity of such claims and develop greater understanding of observed changes. However, the fact that people are continuing to cut down trees in the upper watershed right up to the riparian zone needs to be

critically reviewed in terms of whether people have always behaved like that or it is a new phenomenon. It would be necessary to find out if some aspects of traditional common property resources management approaches could be incorporated into the government statutory systems. For example the Mijikenda tribes still manage sustainably their Kaya forests as common property resources, through their traditional resource management institutions. All members of the community revere and recognize the authority of the elders and the laid down rules (Robertson 1984).

Source: Miller (2002)

Photograph 3. Unmanaged open access resource use along the middle and lower portion of the River Njoro, Kenya.

Among many traditionally agricultural communities in highland ecosystems, the slope was the determining factor on whether land could be cleared or left intact (Ezaza 1992; Buyers and Sainju 1994). Among the Kikuyu community, it was wrong to clear any steep slopes. That left most of the riparian vegetation in tact (Chiuri 1996).

Dilemma of centralized planning

Colonial legacy

When Kenya became a colony early in the last century the British found it necessary to assert authority from a central point. This necessitated dismantling traditional institutions and vesting all the power with the central government. Local people were denied any role in decision making and became passive observers in all spheres of development. The management of key resources, such as water, forest, and wildlife was vested in the colonial state. The locals could only access these resources through unauthorized hunting and fishing (poaching), charcoal burning, grazing in the forest, and farming in the forests and on river banks. They also sabotage installations such as water pipes, destroy fences, and pilferage materials. This is what Scott (1985) calls the weapons of the weak. In his study on Ol Donyo Sabuk National Park in Kenya, Lelo (1994) states that local people who illegally take government controlled resources are not villains in the eyes of their fellow villagers. Instead they are regarded as heroes and heroines.

Post-Independence efforts at decentralizing planning

After independence the government of Kenya adopted several strategies or milestones aimed at enticing people to get more actively involved in the development agenda. This included:

- The production of "African Socialism and its Application to Planning in Kenya" (1965) document, as the basis of national development planning processes for the new country.
- They also introduced self-help slogans and activities all over the country (*Harambees*) as a means persuade local people to build facilities such as schools, dispensaries, water projects and others. Soon this approach became a political tool, and though unpopular, continues today at a low key.
- The Training and Visit (T&V) approach which was aggressively promoted by the Ministry of Agriculture in the 1970s but did not succeed either (Feber and Slade 1984).
- The boldest effort the government ever made to demonstrate commitment to decentralized planning was in 1983, when the District Focus for Rural Development Strategy was launched (ROK 1984). Through this approach power was to be devolved from the centre to the districts. However, over time this noble approach has for all practical purposes been abandoned.

Conventional methods of engaging communities in development processes have failed to yield significant results for the majority of Kenyans. This is exemplified by the spiraling levels of poverty over the years and continued degradation of local environment. Despite the frustrations and failure of these past attempts to introduce local participation in the development planning process, the need still remains to continue searching. This seems the only way Kenya might address environmental degradation facing the country. This will require rethinking the institutions which link resources, people, and government. The NGOs and local CBOs such as the Green Belt Movement, the Kenya Forest Working Group and others have been in the lead in this. However, these groups have often faced tough opposition from the government which has insisted on using the archaic colonial institutions to manage resources. Such institutions would need to include accountable representation from community based organizations (CBOs) such as women groups at the village level, youth groups, church organizations and men groups where they exist, in order for the community to develop ownership of resource use and conservation. Such inclusion brings forth sustainable livelihoods and environments.

True development means improvement of the quality of life of the majority of the people, which in Kenya refers to the rural people as they constitute over 70% of the population (ROK, 1999). Despite various efforts, such as use of improved seeds, agricultural innovations such as organic farming, irrigation and so on, which have increased in use, the majority of rural people have remained untouched by these changes. One of the main reasons is that the changes target men in the rural areas, whereas it is the women who are the actual food and labor providers within the rural setting (Thomas-Slayter and Rocheleau, 1995).

Indeed in many instances, while statistics may show improvements in the standards of living, poverty continues to overwhelm rural communities. Demand for food has grown with population while the level of technology to increase food production has not kept pace (Millenium Development Goals: Progress Report for Kenya 2003). Similarly demand for water and fuelwood increases while the forests are declining and water supply systems failing. These unfulfilled demands are putting pressure on the natural resource base upon which rural populations depend almost entirely.

Accountable institutions and decision-making

A major cause of the failure of development programs to achieve intended results lies in the way the development process has been packaged. The colonial administration dismantled community institutions, and brought centralized decision-making and coercive implementation of policies. This arrangement suited their needs well as they did not have long term interests of the people at heart. Local people did not participate in the making of decisions that affected their lives. However, Kenyans need to take stock of what has been done since independence to correct the mistake. Unfortunately, the top-down approach has been perpetuated. Decisions continue to be made in Nairobi and packaged by experts for the rural people. Rural communities see government extension officers who speak unfamiliar languages address them in quickly arranged meetings. Such meetings are intended to symbolize participation by consultation. Most donor funded projects often use foreign and complicated technologies. As soon the project life span expires and the money runs out and technicians leave, the projects collapse. Local people do not have the capital or the technical know-how to manage such projects. Many times such projects are not within the priority needs of the community.

Table 1. Resource extraction uses by riparian communities along the River Njoro, Kenya.

Riparian Community	Group	Surface Water Extractions at River's Edge							River Bed/Bank Material Extraction			Riparian Trees/ Vegetation/ Cultivation Uses								
		D	L-L	L-S	SL	IR	BL	C	SD	RK	HS	FW	FDC	FDG	VG	VG-MZ	VG-WT	BM	HB	HY
Barut	Women	*d	*			*	*d		*d			*d			*d			*	*	
Ngata	Women	*?	*	*d											*d	*d			*d	
Rumwe	Women	*d				*d	*d					*d		*					*d	
Mwigito	Women	*d	*d			*				*d		*d								
Barut	Men	*	*d			*?	*d		*d									*d	*d	*d
Ngata	Men	*	*d		*?											*d	*d		*d	*d
Rumwe	Men		*d			*d	*d		*d	*d				*d					*d	
Mwigito	Men	d	*d			*d				*d		*d		*d						
Barut	Youth	*	*		*d	*												*d	*d	
Ngata	Youth	*		*d	*?															
Rumwe	YgMen	*d	*		*d								*d	*						
Mwigito	YgMen[d]																			
Barut	Others[a]		*		*d		*d	*d	*d			*d							*d	
Ngata	Others[a]																			
Rumwe	Others[b]		*d		*d		*d		*d	*d	*d	*d	*d	*d					*d	
Mwigito	Others[c]	*d	*d		*d	*d				*d		*d		*d						

Notes:

* use activity carried out by group

d decisions regarding use made by group

? likely decision maker, but unclear from initial report.

[a] 'Others' refers to people from outside the community and ministers (in case of baptism).

[b] 'Others' refers to hired hands and people from other sections of Njoro Town (L-L); other communities in the watershed such as Ngata and Nessuit, as well as outside the watershed (e.g., Lare, Ngecha, elsewhere) (L-L and FDG); traders and construction people from outside the community and watershed (BH, RK); County Council (SN, RK); KARI, forest department, and the Forest Action Network (HS).

[c] 'Others' also includes male youth which were not split out in the Mwigito PRA, and people from other communities in the watershed (L-L).

[d] Included in 'Others' for Mwigito

Resource Extraction Use Codes:

D: fetching water for domestic use

L-L: watering large livestock at the river

Resource Extraction Use Codes:

L-S: fetching river water for or watering small livestock at the river

S: fetching water for transport and sale

IR: river withdrawals for irrigation adjacent to river

BL: fetching water for construction and building houses

C: cultural uses such as baptisms,

SD: extracting sand from river for construction

RK: extracting rocks and gravel from river for construction

HS: humus gathering along banks for tree nurseries

FW: gathering fuel wood along banks, for domestic uses, for sale, and for charcoal making

FDC: grass fodder collection for sale

FDG: grass/fodder livestock grazing along river banks

VG: growing vegetables along side of river (e.g., potatoes)

VG-M: growing maize along side of river

VG-W: growing wheat along side of river for sale

BM: gathering wood, bark, parts of trees for house building materials

HB: gathering herbs and other plant matter for medicinal purposes (roots, barks, leaves)

HY: bee-keeping for honey for sale

Table 2. Community problems and priorities for resource management along the River Njoro, Kenya.

Problem	Perceived Causes & Issues	Ranking[a]			
		N	B	R	M
Insufficient (river) water	River runs dry periodically (Barut); lack of alternative sources; poor river protection; shallow dams upstream (Barut); drought; irrigation upstream; sand scooping; overstocking of animals; outsiders extracting water for sale, too many users (Barut); obstruction of river flow (Rumwe)	3	1	7	
Low income	Over-reliance on milk and maize, farm employment, and sawmills employment (which have shut down); reliance on middlemen for marketing; lack of storage facilities for wheat; lack of market for produce.			1	
Water	Poor quality water, not enough- scarcity esp. in January-February dry season; water siltation.	3			1
Water-borne diseases (consuming polluted river water)	Run-off with dirt including human waste; dirty water from washing of vehicles, laundry, and bathing in river; dirty effluents; lack of latrines; soil erosion; sand extraction makes river dirty; dumping of waste in river (from Kaptembwa in Barut);		2		3
Poor community cooperation	Poor leadership; ignorance about group value.			2	
Fuel wood (scarcity)	Deforestation; failure to plant trees on own shambas; closing down sawmills.			4	2
Polluted river water	Human diseases; no water access points, lack of sewage system, garbage collection. (details limited in draft PRA)	3		8	
Sand scooping (extraction from the river)	Related to unemployment; rising demand for sand; laxity in enforcing rules; destroys roads, makes river dirty; causes land slides, deaths, and devaluation of land.		3		
Weak community water institutions	Low income; low level of skills to start income generating project; lack of trust among members; poor leadership; poor project management.			3	
Flooding	Siltation of the river; soil erosion; sand scooping; destruction of vegetation on farms and on river banks increasing run-off to river; bank vegetation removal related to fuel wood gathering, tree felling, and tree dying from root/bark removal.		4		
Electricity	In village but not connected to houses.				4
Weak Nakuru County Council	Lack of sewage system, garbage collection. (details missing in draft PRA)			5	
Insecurity	Unemployment; drunkenness.				5
Unemployment	No jobs				5
Lack of riparian managem't plan	Lack of knowledge; lack of ownership of riparian zone.			6	
Dumping	Attitude.				6
Livestock diseases	Plastic papers; outbreaks; expensive drugs.				7
Lack of extension services (soil erosion)	Extension officers never seen; steep slopes; lack of terraces.				8
Poor roads	Erosion causes pot holes; no bridges, river Njoro blocks access to Egerton U. for many residents who work at U.; lack of culverts.	1			8
Seasonality of fodder	(details missing in draft PRA)			9	
Inadequate infrastructure	No water access points, inadequate bridges, lack of storage facilities. (details limited in draft PRA)	2		10	
Notes: [a] B = Barut, R = Rumwe (section of Njoro Town), M = Mwigito (section of Njoro Town), N = Nessuit					

SUMAWA stakeholder involvement process

The SUMAWA-CRSP project has taken the lessons from past development projects and chosen to apply a participatory approach from the onset. The main focus of the project is sustainable development of the River Njoro Watershed in order to reverse the current declining trends. The approach is motivated by a strong believe that participation by the beneficiaries in any project is fundamental, and that locally selected and serviceable technologies and policies are more likely to succeed unlike complicated, expensive, imported or imposed ones chosen by external decision-makers. This approach also incorporates local values, cultural traditions, local institutions, and local knowledge systems in its attempts to bring science to bear to address local watershed problems. The project builds on the premise that sustainable development must incorporate approaches that communities themselves can manage and control.

Dialogue and coordination for watershed-wide action planning

As a result of the dialogue that has been initiated through the participatory approach, communities and sub-groups in the Njoro watershed have been actively planning and implementing local actions to improve conditions and begin conserving riparian resources. Using the PRA approach, the communities living from the forest zone down to Lake Nakuru, have managed to develop preliminary their own community watershed action plans (CWAPs). Proposed actions include planting trees on household farms to reduce pressure on the riparian zone, building roof catchment water tanks to increase domestic water supplies, construction of pit latrines to curb river pollution, developing local enforcement mechanisms for protecting the riparian reserve and for the laws on river pollution, rehabilitating water supply infrastructure and building new water supply systems, among others.

However, these have been largely developed and pursued separately in individual communities and risk coming into conflict without coordination and harmonization of efforts across the watershed. Thus, the current phase of planned SUMAWA Project outreach activities is designed to create opportunity to begin engaging in dialogue to develop cooperative solutions to the management of river water and riparian zone resources between communities and "outsiders", in cases where outsiders exploiting riparian resources are actually from other communities within the watershed (see Table 1). Some of these outsiders are in fact large institutional, public and commercial enterprises in the watershed who, under the free-access mentality, also extract key resources in the riparian zone along with poor households and their members.

Community priorities for resource management

Using Participatory Rural Appraisal (PRA) techniques, it was possible to identify community problems and priorities for resource management along River Njoro. These are listed in Table 2. Water scarcity and water quality problems for human and livestock health, related human diseases, and fuel wood scarcity are top-ranked problems. The underlying root cause of these problems is the lack of implementable policy on watershed and riparian resources management. This has led to degradation of the forest cover which is a critical component of the water catchment system, to encroachment and uncoordinated de-gazettement of public forest lands. This has adversely affected water quality and quantity of River Njoro and has facilitated the destruction of the riparian vegetation.

Future activities with stakeholders.

Sustainable management of the riparian zones will depend on the collaboration and cooperation of all the stakeholders. The proposed activities will include a series of workshops and longitudinal exchange visits along the watershed. All stakeholders will be brought together to share their experiences and challenges as well as visit the watershed from the source to the lake. The first workshop will bring together representatives of land, water and forest policy makers across the ministries with stakeholder representatives from within the watershed. This first meeting is meant to examine and interpret the meaning of various legislations and begin to tackle their harmonization in order to minimize the confusion that is already in existence.

In the long run the success of stakeholders' involvement will depend on the policies and legalities governing watersheds in the country and the region. The current Kenya government is committed to ensuring sustainable

resource management and preserving critical water catchments like that of the River Njoro as a long term measure to address water shortages in the country. The government has issued a series of new environmental rulings and regulations, and has established Provincial Water Boards aligned with major water basins in the country. These new actions will change the way the country manages its natural resources in several ways, which includes boards accountable to the local people who elect them, a broader mandate to include pollution control and power to prosecute offenders.

The SUMAWA stakeholder engagement team will be assessing the usefulness and applicability of these laws in the context of the River Njoro and the potential of empowering local communities and other stakeholders to take greater control over the development and management of resources in the watershed, within the evolving legal context and newly established regulations.

Conclusion

A model of sustainable management of watershed resources (SUMAWA) is being developed by a multidisciplinary team from Kenya and the USA using the River Njoro Watershed. So far the team has established that there are several conflicting government policies and laws which are at variance with local people's traditions and cultural practices. The government of the day has not changed from the colonial model of centralized, top down and coercive mechanisms in applying these laws, policies and regulations. This is further compounded by the lack of enforcement procedures and institutions. As a result, communities along the watershed "evoke the weapons of the weak" by developing a free access mentality to the riparian zone. Consequently rapid new settlement of formerly forested areas and riparian degradation along the river have increased the risks of downstream flooding, water pollution and decreasing water availability at critical times.

The ongoing research has established that women are the key players in domestic water supply from the river, and firewood collection along the banks. Older men on the other hand are responsible for livestock watering, grazing and small-scale irrigation.

The resolution of the many problems facing the River Njoro Watershed and others in the region which share it problems requires a multi-pronged approach. This includes new institutional frameworks to bring together government agencies, NGOs and other stakeholders of the riparian resources in dialogue and negotiation. The future condition of riparian resources and services will be closely linked to how well all the stakeholders can cooperate to define a coherent management structure and enforcement mechanisms that will be acceptable to all. If successful, this will ensure that future policy changes can be negotiated and endorsed by all concerned. The on-going debate on the new forest bill is a pointer that if the government is willing to decentralize systems for natural resources management, communities are willing to participate. However, this requires establishment of acceptable communication channels across diverse interest groups and levels of decision-making. Younger men extract water, fodder and other resources for sale as hired labor. This means as the Kenya government focuses on sustainable development, clearly mandated institutions and mechanisms that link resources, people and government will need to be created.

The SUMAWA project applied PRA tools to begin empowering communities to identify riparian problems and solutions that they can manage locally. The next stage is to interject scientific knowledge of new options into the community dialogue and use selected community action plans to demonstrate tangible activities which communities can undertake with few or no external resources. Other community members will then be able to visit the demonstration sites and learn new riparian resources management techniques. In addition as the community gets sensitized on local level solutions there will be need to sensitize them on policy and legal issues that could help or constraint their efforts. At the same time policy makers will need to be made aware of the communities' aspirations which have to be met for them to be active and enthusiastic players in the coordinated overall management of riparian resources. The process of bringing community leaders and government policy makers together will be effected through tiered workshops. The workshops will focus on how to harmonize conflicting government laws on land, water and forest resources in the River Njoro Watershed which are the corner stones of riparian management.

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Dynamics of poverty, livelihoods and property rights in the Lower Nyando basin of Kenya

Brent Swallow, Leah Onyango, Ruth Meinzen-Dick and Nienke Holl

Data from 14 villages representing contrasting circumstances around the Lower Nyando basin in Kenya indicate that the incidence of poverty is higher in the flood plain than in the other parts of the basin. Over the last ten years, poverty has risen significantly in an area controlled by the National Irrigation Board (NIB), increased slowly in smallholder mixed farming areas, and remained relatively stable in areas supported by the Provincial Irrigation Unit (PIU). Reasons for these trends are discussed, and are linked to factors including land tenure and forms of external support. Customary gender biases against women are also exacerbated in the irrigation schemes. As it plans a revitalization of the irrigation sector under the new Water Act of 2002, the government should consider organizational arrangements that will provide women and men farmers with suitable services without compromising their discretion over land and water use.

Key words: poverty, livelihood strategies, irrigation, Kenya, property rights, land tenure

Introduction

Rural Africa is an area of ingrained poverty, stagnant economic growth, and enduring customs. Yet over the last 10-20 years, Africa's rural populace has been buffeted by a number of strong dynamic processes: population growth means greater pressure on limited land and water resources; changing world and domestic markets have translated into lower prices for traditional commodity exports and higher prices for purchased inputs such as fertilizer; structural adjustment means less involvement of central government agencies in provision of infrastructure and public services, and greater involvement by a plethora of non-governmental organizations and private firms. While some of these trends may lead to improved economic performance and more equitable access to resources, there is great cause for concern. Over the last 10-20 years, much of sub-Saharan Africa has experienced stagnant growth, increased concentration of land ownership (Jayne et al., 2001), more scarce and polluted water resources, greater numbers of people suffering poverty and malnutrition, and increased incidence of human diseases, especially HIV / AIDS, malaria and water-borne diseases (Benson, 2004). Distinct declines in human security and economic growth have been reported in Central Africa and several countries of East and Southern Africa (Benson, 2004). Between 1970 and 2002, life expectancy at birth declined across most of southern and eastern Africa (Benson, 2004, p.38).

The Nyando basin in western Kenya is an interesting case in point. Previous research has shown the 3500 km2 Nyando basin to be an area of high and increasing poverty, recurrent flooding, stagnant agricultural production, increasing prevalence of HIV / AIDS, malaria and diarrhea, and a major contributor of sediment and nutrients into the eutrophying Lake Victoria (Swallow et al., 2002). It is also an area given particular attention by the Kenya government in ongoing reforms of the environment, land, domestic water and irrigation sectors. There were a number of important gaps in knowledge: what are the characteristics of poor and vulnerable people? Is lack of access to land, water and tree resources a defining or incidental characteristic of the poor? Are there groups of poor and vulnerable people who are particularly susceptible to losing rights with planned changes in resource management institutions?

The Safeguard project was initiated by the World Agroforestry Centre (ICRAF), Maseno University and the International Food Policy Research Institute (IFPRI) to address these questions in the context of the Nyando basin. Safeguard is short for *Safeguarding the rights of poor and vulnerable people to critical land, water and tree resources in the Nyando basin of Western Kenya*. Safeguard is part of the The Safeguard project has illuminated the remarkable diversity of conditions that prevail across this basin of 3500km2, which is home to about 750,000 people. This paper reports results from Safeguard pertaining to poverty and property rights dynamics in the lower floodplain area of the Nyando river adjacent to Lake Victoria. The results demonstrate how three different types of irrigation development have shaped poverty and livelihood dynamics in the area.

Methods

The Safeguard project employs a package of research methods grounded on the following principles:

- nested scales – collection of data at multiple, nested scales in recognition of the "fractal" nature of poverty processes
- representing the range of circumstances – use the multi-scale approach to identify the range of circumstances in the basin, then sample villages to represent that range
- dynamic – focus on processes that have effect over the last 10-25 years
- diverse livelihood strategies – it is important to recognize and explicitly collect data on the full range of options that people employ to earn a livelihood (e.g. Ellis 2000)
- multiple facets of poverty – explicitly considering the consumption, vulnerability, and agency aspects of poverty (Narayan et al., 2000)
- inclusive and participatory – the population under consideration should provide their own definitions of poverty, livelihood strategies and their own assessment of poverty and livelihood trends (Krishna, 2004; Kristjanson et al., 2004)
- legal pluralism approach to property rights – recognizing that there often are multiple and overlapping sources of sanction for property rights (Meinzen-Dick and Pradhan, 2002).

The following methods satisfy these principles:

Characterization of hydronomic and terranomic zones – The accompanying paper by Onyango et al. (2005) presents the approach used and results of this analysis.

Selection of villages to represent the range of circumstances in the basin – Villages were chosen to represent 12 distinct zones in the basin. A total of 14 villages were selected, one village for each of ten zones and two villages for each of two zones. These results therefore represent the variation found across the basin, but cannot be simply aggregated to represent the whole basin. Table 1 shows comparative data for the 14 villages.

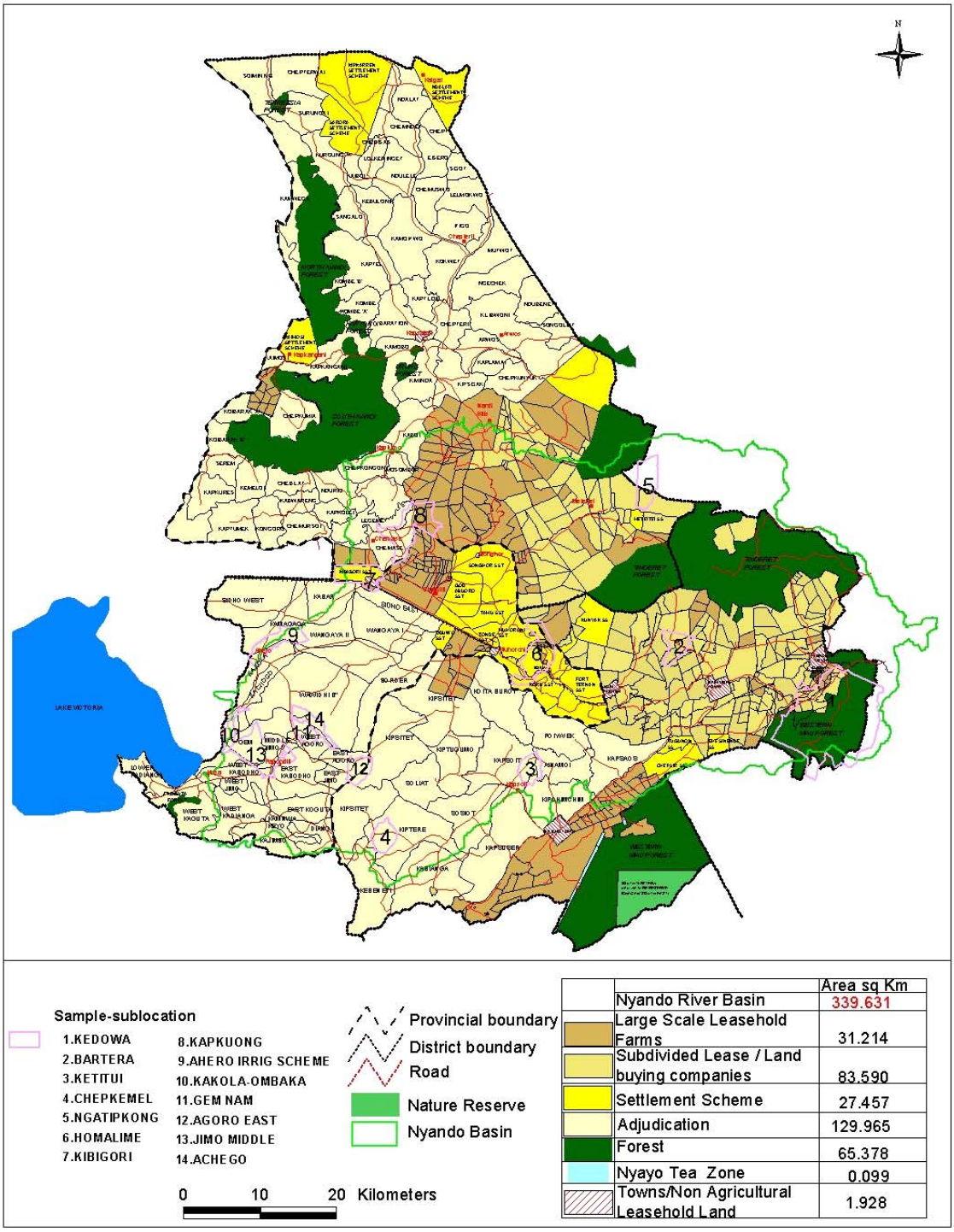
Stages of progress method as the basic data collection approach in each village – The Stages of Progress method has been developed by Anirudh Krishna of Duke University to study factors affecting inter-generational poverty dynamics. To date it has been applied in 3 states in India, Western Kenya, Uganda and Peru (Krishna, 2004; Krishna et al., 2004).

Strengthening the focus on livelihoods and property rights in the stages of progress method – The livelihood focus was closely integrated into the base method and the property rights methods stressed the legal pluralism approach.

Household survey – A stratified random total of 30 households was selected and interviewed in each of the 14 villages. The household survey focused on rights and access to land, water and trees, and livelihood strategies.

Key informant and group interviews – One of the co-authors of this paper undertook a more detailed study of gender and water management in the irrigation area in the lower Nyando basin. This study then provided the basis for the sampling of different irrigation systems as well as information used in this paper.

Table 1 presents descriptive information for the 12 zones and 14 villages included in the study. Note that the area represents a wide range of conditions. Land tenure varies from adjudicated areas, largescale leasehold, subdivided leasehold, settlement schemes, illegal "squatting" in a forest reserve, and contested property rights in an irrigation area. Average income poverty rates vary from 40% to 70%. Population density varies from less than 100 to more than 1000 people per square kilometer. Elevation varies from 1100 masl near Lake Victoria to over 2500 masl in the headwaters. The majority ethnic group in the lower part of the basin is Luo; the Kipsigis and Nandi Kalenjin are the majority in the upper part of the basin. The study also covered minority populations of Ogiek and Kisii in the upper part of the basin.



Map 1. Nyandi, Kericho and Nyando District: Land tenure

Source: Safeguard project

Results

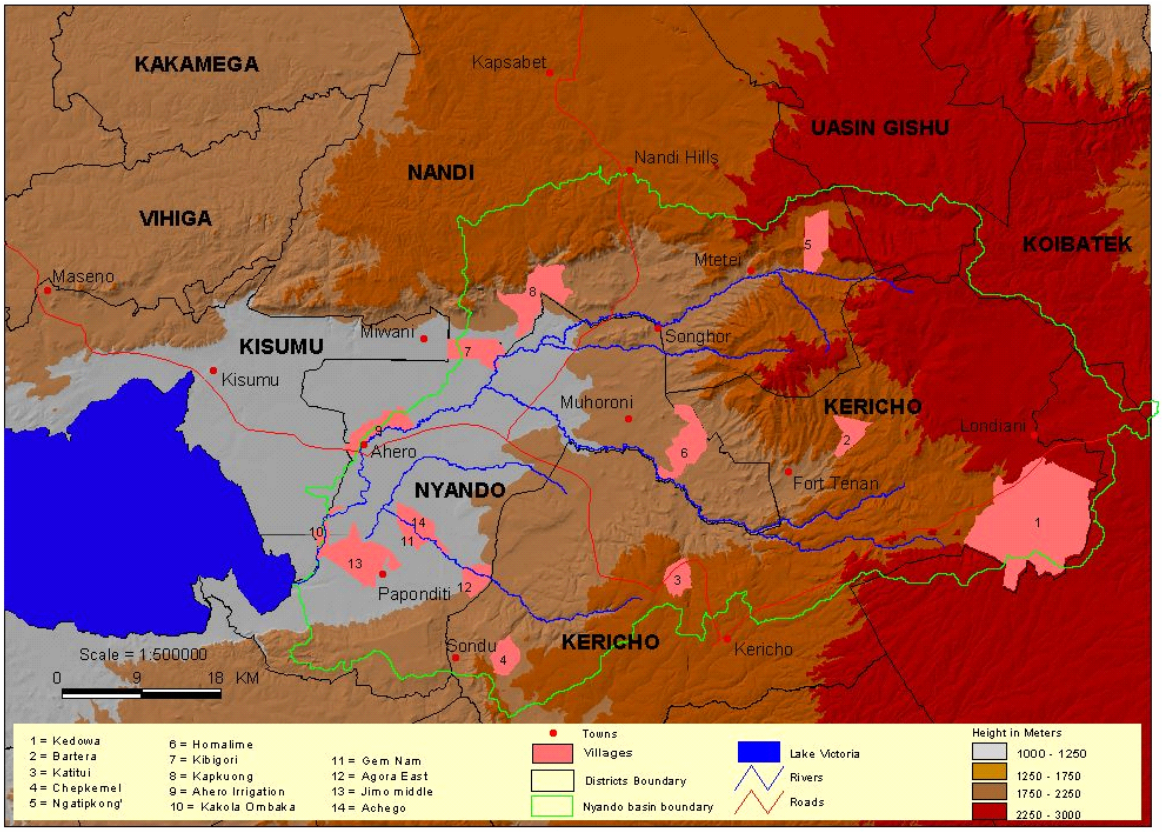
Access to water

The household survey that was conducted with a sample of about 30 households per village posed several questions about access to water. For the five villages in the Nyando floodplain, Table 1 summarizes data on the number of households who indicated that access to water was more difficult, easier or about the same as ten

Table 1. Characterization of the Safeguard study villages

Zone; elevation	Land tenure Status	Irrigation development	Safeguard village number & village name	District(s)	Popul-ation density (persons / km)	Main ethnic group	Production system	% below poverty line in location
Floodplain; 1100 masl	Adjud-icated	Mixed smallholder, some ad hoc irrigation	10 = Kasirindwa; 11 = Karabok	Nyando, Kisumu	224-1000	Luo	Smallholder mixed farming, some private irrigation	37% for village 10, 55% for village 11
Floodplain; 1100 masl	Adjud-icated	Irrigation development supported by PIU, operational in 14, not operational in 13	13 = Kasiwindhi; 14 = Awach scheme	Nyando, Kisumu	224-1000	Luo	Smallholder commercial irrigation and dryland agriculture	68% for village 13; 72% for village 14
Floodplain; 1100 masl	Contested; formally owned by NIB but promised to local residents	NIB irrigation	9 = Nakuru	Nyando, Kisumu	224-1000	Luo	Designed for irrigated rice; more diversification since NIB collapse in 1998	63%
Lower Awach catchment; 1250 masl	Adjud-icated	None	12 = Miolo	Nyando	224-527	Luo	Mixed subsistence, NR extraction	65%
Upper Awach catchment; 1700 masl	Adjud-icated	None	4 = Chepkemel	Kericho	88-149	Kipsigi/ Kalenjin	Mixed cash/ subsistence, coffee, dairy, maize, banana, s/holder tea	49%
Mid-altitude part of Kapchorean basin	Undivided leasehold	None	6 = Ongalo	Nyando	<88	Luo	Commercial Sugarcane	47%
Lower Nyando basin	Re-settlement scheme	None	7 = Kimiria Aora	Nyando	150-303	Luo	Commercial sugar	48%
Mid altitude; 1500 masl	Large-scale leasehold	None	8 = Poto poto	Nyando	88-149	Nandi Kalenjin	Commercial sugar mixed farming	48%
High altitude; 2000 masl	Adjud-icated	Some home garden irrigation from springs	3 = Kiptagen	Kericho	224-500	Kalenjin	Small-scale tea, some coffee, sugarcane, maize	49%
High altitude; 2100 masl	Sub-divided leasehold	None	1 = Kaminjeiwa; 2 = Nyaribari A	Kericho	224-400	Mixture of Kalenjin, Kisii and others	mixed farming,	41%
High altitude; 2200 masl	Indigenou s forest dwellers on forest land	None	5 = Ngendui	Nandi	87-400 mixed	Ogiek / Nandi Kalenjin	Small scale mixed	60%

Source: Unpublished data compiled by the Safeguard Project; poverty and population data from CBS (200x).



Map 2: Elevation and the Safeguard sample villages in Nyando Basin

Source: Source: Safeguard Project

years ago, while Table 2 summarizes data on the number of households who indicated that the quality of water available was better, worse, or about the same as ten years ago. The overall indication is that both water access and water quality have improved over the last ten years. Regarding water access, 49 respondents indicated improvements over the last ten years, compared to 19 indicating deterioration. Regarding water quality, 55 respondents indicated that water quality had improved over the last 10 years, compared to 17 indicating that water quality had worsened. These results were generally consistent across the five villages considered in this paper. Additional analysis (not shown) shows that there are no differences between villages in the amount of time spent collecting water in the dry season and wet season.

Table 1. Current level of access to water compared to ten years ago

Village number & irrigation system type	Missing	Easier	More difficult	About the same	Total
9 – National Irrigation Board	0	10	3	17	30
10 – Smallholder ad hoc	0	12	0	18	30
11 - Smallholder ad hoc	0	10	2	18	30
13 – Provincial Irrigation Unit support to farmers	0	13	9	7	29
14 – Provincial Irrigation Unit support to farmers	1	4	5	20	30
Total	1	49	19	80	149

Source: Unpublished data compiled by the Safeguard project.

Table 2. Current water quality compared to ten years ago

Village number & type of irrigation system	Better	Worse	About the same	Total
9 – National Irrigation Board	5	8	17	30
10 – Smallholder ad hoc	11	2	17	30
11- -- Smallholder ad hoc	12	1	17	30
13 – Provincial Irrigation Unit support to farmers	19	2	8	29
14 – Provincial Irrigation Unit support to farmers	8	4	18	30
Total	49	19	77	149

Source: unpublished data compiled by the Safeguard project.

Table 3 indicates that households in the five villages spent an average of 1.9 hours per day collecting water in the dry season and 44 minutes per day collecting water in the wet season. The average amount of water collected is 100 litres per household per day in the dry season and 25 litres per household per day in the wet season. Additional analysis (not shown) shows that households in village 10 collect significantly more water in both the wet and dry season than households in the other villages.

Table 3. Dry season and wet season water collection in Safeguard villages 9, 10, 11, 13 and 14

	N	Minimum	Maximum	Mean	Std. Deviation
Time spent (hours per day) collecting water during dry season	134	.02	8.00	1.89	1.49
Volume of water (litres) collected per day in the dry season	139	18.00	270.00	100.07	46.63
Time spent (hours per day) collecting water during wet season	93	.00	6.00	0.73	0.76
Volume of water (litres) collected per day in in wet season	140	.00	160.00	24.96	32.42
Valid N (listwise)	90				

Land and water governance

The village representative groups and women-only focus groups were asked questions about access and control over water. Follow-up questions were also included in the household survey. The results are remarkably similar from village to village, except for the NIB village and village 14, which still has an operational irrigation system supported by the Provincial Irrigation Unit.

All villages are predominately Luo, and all except village 9 have been adjudicated, so that individuals hold secure title to their land.

Luo custom holds that water access should be freely available. In Village 10, for example, it was reported that: "*Everybody has access to all community water points. No one is allowed to block the recognized community water points.*" Luo custom also supports public access to private land resources for grazing, collecting firewood, and passing through. With few physical or social fences, access to water resources is

relatively freely available. It appears that it is only in irrigation areas that have had strong involvement of external agencies that the Luo customs have not held sway. The community discussion in Village 9 suggests the intriguing possibility of a spillover to local customs regarding water access: "*Water is meant for everyone's use and there should be no restriction as to usage of water. When coming from the river, one is not allowed to pass through another person's homestead for you are likely to fall."*

One of the possible drawbacks of the Luo custom for land and water governance is that there is relatively little incentive for private individuals or small groups to invest in protecting existing water sources or creating new water sources. This has particular impacts on women, who are responsible for provisioning the household with water and for providing healthcare within the household.

Land tenure security is much more restricted for farmers in Village 9. When the National Irrigation Board built the irrigation system, they purchased all land in the area. Standardized plots (of 50x50 meters for homestead, and 4 acres of irrigated fields) were then allocated to farmers, who remain "tenants" of the system. The farmers are not allowed to plant any trees or have any livestock, or even to bury the dead on this land. To add to the insecurity of tenure, farmers can be evicted for "laziness" or failure to cultivate their land. The plots cannot be subdivided, which violates Luo customary norms that all sons are entitled to get land from their fathers. Because land rentals are also restricted on NIB land, landless sons have more difficulty obtaining any land to cultivate.

A detailed investigation of water governance in Village 9 indicates that not only does the National Irrigation Board influence irrigation water management, but this also had some spillovers (in terms of mediating institutions) onto other water resources in the village (Table 4). However, customary norms play more of a role in granting authority over water sources used primarily for domestic uses, whereas the Nyando River, which is used for irrigation, falls more under statutory law and government agency management.

Table 4. Water sources and their management in Village 9

Source of water	Use of water	Users of water	Where do the users draw authority to use the water	Who manages the water	Can users transfer their rights	Who owns the land on which the water is found	What forms of pollution affect the water source	Mediating Institutions
Marega river	Cooking Farming Drinking Washing	All the villagers	Customary	None	No	G.O.K/NIB	Chemicals from irrigation scheme plant and from chemical factory	The irrigation scheme and G.O.K
Nyando river			Statutory irrigation act and non statutory	Irrigation board for irrigation purposes	Yes			The irrigation scheme and G.O.K
Ombeyi river			Customary	No one	Yes			The irrigation scheme and G.O.K
Shallow well		All	Customary	Owner of land	No			

Results from the household survey indicate a fairly high level of social organization around water management in Village 14, the only village that had a functional collective irrigation system at the time of the survey. As indicated in Table 5, 29 of the 30 surveyed households in Village 14 pay their water fees, compared to only 3 of 10 households in Village 13 and 10 of 27 households in Village 9 who pay their water fees. However, the irrigation system in Village 14 is not without conflict. Table 6 indicates that this is the only village in which most households in do not think that there is equality in access to water. In both Village 9 and 14, 24 respondents reported having experience with water conflicts in their village. Thus, both community-managed and NIB systems have higher degrees of conflict than those assisted by the Provincial Irrigation Unit.

Table 5. Payment of water fees in the 5 Safeguard villages in the Nyando floodplain

Village number and type of irrigation system	No	Yes	Total
9 – National Irrigation Board	10	17	27
10 – Smallholder ad hoc	1	13	14
11- -- Smallholder ad hoc	3	7	10
13 – Provincial Irrigation Unit support to farmers	18	3	21
14 – Provincial Irrigation Unit support to farmers	1	29	30
Total	33	69	102

Table 6. Payment of water fees in the 5 Safeguard villages in the Nyando floodplain

Village number and type of irrigation system	No equality of access	Equality of access	Total
9 – National Irrigation Board	7	23	30
10 – Smallholder ad hoc	10	20	30
11- -- Smallholder ad hoc	8	21	30
13 – Provincial Irrigation Unit support to farmers	5	25	29
14 – Provincial Irrigation Unit support to farmers	17	12	30
Total	47	101	148

Table 7. Experience with irrigation management conflicts in 5 Safeguard Villages in the Nyando floodplain

Village number and type of irrigation system	No experience with irrigation management conflicts	Experience with irrigation management conflicts	Missing	Total
9 – National Irrigation Board	2	24	4	30
10 – Smallholder ad hoc	1	3	26	30
11- -- Smallholder ad hoc	3	1	26	30
13 – Provincial Irrigation Unit support to farmers	6	10	13	29
14 – Provincial Irrigation Unit support to farmers	6	24	0	30
Total	18	62	71	148

Water, land and gender in the Nyando floodplain

In the Nyando floodplain, women have primary responsibility for providing water for domestic needs. Table 8 lists the first, second and third most important collectors of domestic water: clearly wives and children are the main collectors of water for the 150 households involved in the Safeguard household survey. Less than 10% of respondents indicated that husbands ever collected water. The average length of time spent collecting water in the wet season is 0.73 hours per day in the wet season (standard deviation of 0.76) and in the dry season is1.89 hours per day (standard deviation of 1.5) (see Table 3).

Table 8. Most important household water collectors

		Most important hh water collectors		Second most important hh water collectors		Third most important hh water collectors	
		Freq.	%	Freq.	%	Freq.	%
Valid	Wife	107	71.3	14	9.3	3	2.0
	Husband	4	2.7	6	4.0	4	2.7
	All children	20	13.3	53	35.3	7	4.7
	Male children	7	4.7	23	15.3	20	13.3
	Female children	7	4.7	12	8.0	8	5.3
	Relatives	4	2.7	8	5.3	1	.7
	Total	149	99.3	116	77.3	43	28.7
Missing	System	1	.7	34	22.7	107	71.3
Total		150	100.0	150	100	150	100

Although women are not likely to own land in any of the study villages, their land rights are more restricted in Village 9 than in the other areas. Whereas in other villages wives are allocated their own plots of land to grow household food, in Village 9 all irrigated production was marketed through the husband, who collected the money and distributed it to his wives as he saw fit. This gives women less control over resources than under customary systems.

Poverty and livelihood trends in the Nyando basin

One of the outputs of the Stages of Progress village survey is a list of all households in the village, with the "stage of progress" currently attained by each household the stage attained 10 years ago by that household (or its predecessor), and the stage attained 25 years ago by that household (or its predecessor). The stages are then mapped into categories of poor, not poor, and relatively prosperous, using definitions provided by each community. Fortunately, the conceptions of poverty and the stages end up being relatively similar from village to village and thus can be compiled and compared across villages.

Figure 1 presents a compilation of the poverty to prosperity data for all households in the 14 study villages, aggregated into three elevation zones – upper, medium and lower. The results show that poverty is generally highest in the lower altitude zone, now about 40% of the sample households, and over the last 10 years has been increasingly most rapidly in this region, an increase of over 15%. These data are consistent with the national sample and census data for Kenya which show Nyanza province (which includes the lower Nyando basin) having the highest rate of poverty in Kenya, and the highest rate of increase over the 1994 to 1997 period. HIV / AIDS is one of the reasons for this overall trend in poverty: the Luo population has the highest rate of HIV / AIDS infection among both men and women in all of Kenya.

Figure 2 presents a breakdown of the poverty – prosperity data for the villages in the floodplains. The results indicate very different patterns across the three types of land tenure and water management. Twenty-five years ago, poverty rates were lowest in villages 10 and 11, smallholder agriculture areas where the residents have long held secure land tenure. Small amounts of land in those villages are irrigated using flood, bucket and pump irrigation. Poverty has increased in those villages, slowly until 10 years ago, more rapidly since. The area covered by the National Irrigation Board had a poverty rate of over 30% in the early years of the NIB irrigation scheme, a rate which fell to the high 20% 10 years ago, then exploded to over 60% at present. This corresponds to a collapse in the NIB services to the irrigation system, due to lack of financial resources for the agency to maintain the irrigation system. As a result, rice cultivation declined after 1994, and ceased in 1998. In contrast, the two villages that were supported by the provincial irrigation until from the 1980s until the present time experienced a modest decline in the rate of poverty from 25 years ago until the present time, with a current poverty rate of about 38%.

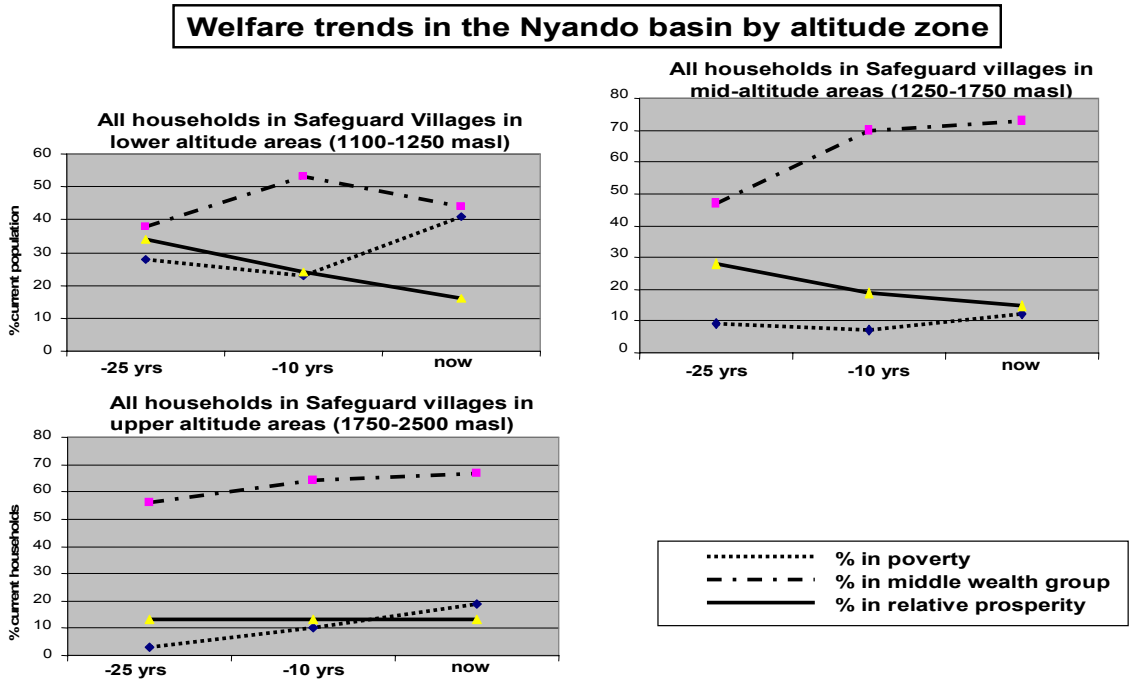


Figure 1. Welfare trends in the Nyando basin by altitude zone

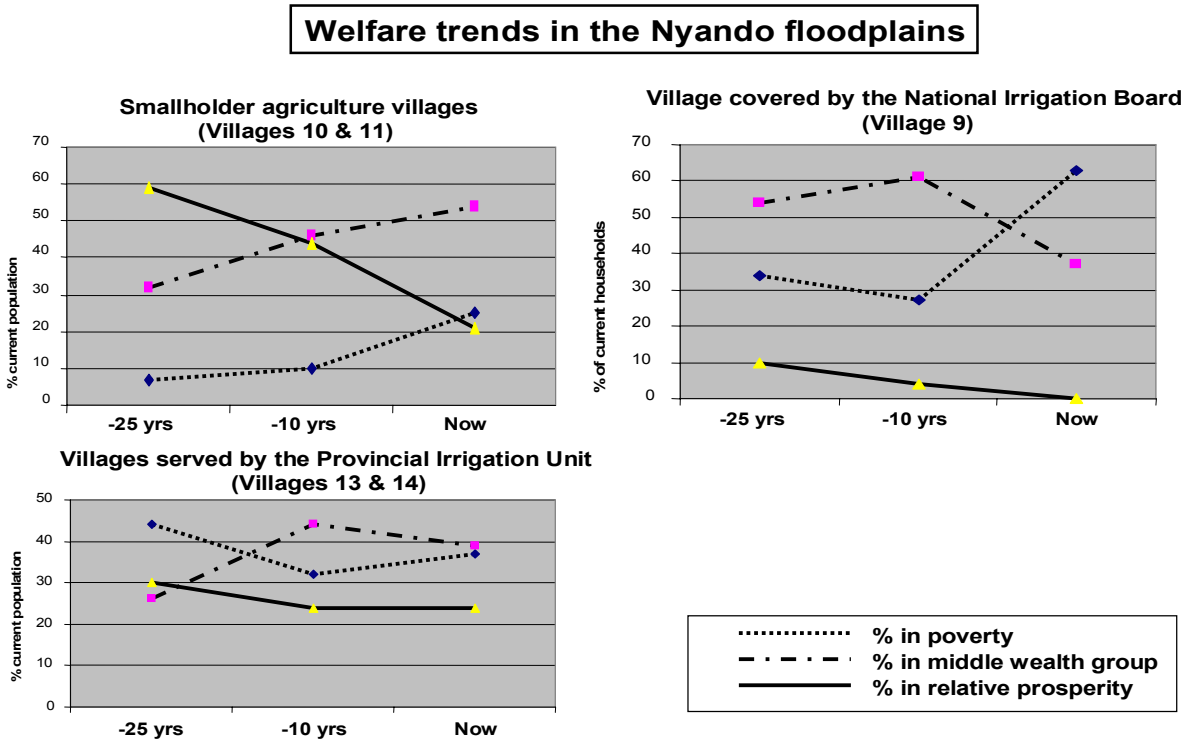


Figure 2. Welfare trends in the Nyando floodplains

Table 9 lists the number of households practicing different livelihood strategies at the present time in each of the 5 Safeguard study villages in the Nyando floodplain. It also lists the total number of strategies listed for all households in each village, the average number of strategies reported for each household, and the current rate of poverty as reported by the village representative groups. It is noteworthy that the village with the highest current rate of poverty (Village 9, 44%) has the lowest number of strategies employed per household. The village with the lowest current rate of poverty (Village 10, 18%) has the highest number of strategies employed per household. Households in the smallholder agriculture area appear to be more diversified than in the irrigation area. Village 14, which has the most functional remaining irrigation system in the area, has the highest number of households still growing rice.

Table 9. Number of households practicing alternative livelihood strategies in the 5 villages of the Nyando floodplain

	Village 9 -- National Irrigation Board	Village 10 – Smallholder mixed farming	Village 11 – Smallholder mixed farming	Village 13 – Supported by Provincial Irrigation Unit	Village 14 – Supported by Provincial Irrigation Unit
Rice	2	1	0	15	66
Maize	13	48	56	33	64
Sugarcane	0	39	1	0	0
Tomatoes	2	41	10	2	4
Kale / onion	1	50	17	1	7
Cattle	16	30	26	18	34
Sheep and goats	2	27	31	3	33
Trade	23	20	41	11	2
Casual labour	31	6	17	8	25
Boda Boda (bicycle taxi)	4	8	4	1	0
Other skilled employment	2	5	14	8	3
Formal employment	2	4	13	11	11
Total strategies in village	98	279	230	111	249
Number of households in village	70	63	103	52	90
Average strategy / household	1.4	4.43	2.23	2.13	2.77
Current poverty %	44	18	23	19	33

We conducted a further analysis in order to explore the hypothesis that the number of strategies – a measure of income and livelihood diversification – affects the extent of poverty and welfare. We compiled data for all 377 households in the 5 Safeguard sample villages in the Nyando plain, including the current stage of growth, the stage of growth 25 years ago, the stage of growth 10 years ago, the current number of livelihood

strategies, whether the household had formal employment as a livelihood strategy, and whether the household produced vegetables for sale (one of the strategies enabled by irrigation). A simple linear regression was conducted of the following model:

Stage0i = f (Stage-25i, Stage-10i, NumLSi, FormSeci, Vegi, Village)

where Stage0i is stage of progress now for household i, Stage-25i is stage of progress 25 years ago for household I, Stage-10i is stage of progress 10 years ago for household I, NumLSi is current number of livestock strategies for household I, FormSeci is 1 if household i currently has formal sector employment and 0 otherwise, Vegi is 1 if household i currently grows vegetables for sale, and Village is a set of binary variables representing village fixed effects (with Village 9 as the base village).

The results presented in Table 10 show that the model has quite high explanatory power, explaining 53% of the total variation and the overall equation is highly statistically significant. The number of livelihood strategies does indeed affect the stage of progress, with an estimated marginal effect of about 0.6 stages for each additional livelihood strategy. As expected, formal sector employment also has high statistical significance, with a marginal effect of almost 3 stages of progress. Vegetable production surprisingly has a negative and significant relationship with stage of progress, indicating perhaps that labour intensive vegetable production tends to be undertaken by poorer households within the community. Stages of progress 10 years ago and 25 years ago are both positively related to current stage of progress, although the stage attained 25 years ago is not statistically significant. Results that are particularly important for this study are the coefficients on the village fixed effects. Accounting for the number of livelihood strategies, formal sector employment, vegetable production, and past stages of progress, the average stage of progress achieved by households in Village 10 is significantly less than Village 9, and the average stage of progress achieved by households in Villages 13 and 14 are higher than Villages 9, 10 and 11. This suggests that the villages supported by the Provincial Irrigation Unit experienced improvements in their welfare that are not accounted for by the diversification of livelihood strategies or improved access to formal sector employment. An additional analysis of the stages of progress in the five villages shows that the inter-village differences in stages achieved may be partly accounted for by the number of stages elicited by the village representative groups. While villages 9, 10, 11 and 13 listed 11 or 12 stages of progress, village 14 listed 14 stages. Further analysis will need to adopt an analytical method that accounts for these differences.

Table 10. Regression model to examine correlates of current stage of progress in 5 Safeguard sample villages in the Nyando floodplain

Variable	Estimated coefficient	Standard error of estimate
Constant	0.984*	0.496
Stage-25	0.070	0.052
Stage-10	0.347**	0.055
NumLS	0.592**	0.058
Village10	-0.921*	0.466
Village11	0.374	0.393
Village13	2.563**	0.869
Village14	1.384**	0.406
FormSec	2.972**	0.406
Veg	-0.216*	0.088

n = 372, R^2 = 0.53, F = 44.67

* indicates significance at the 5% level of confidence, ** indicates significance at the 1% level of confidence.

Table 11. Stages of growth , poverty and prosperity lines in the Nyando floodplain villages

	Village 9 -- National Irrigation Board	Village 10 – Smallholder mixed farming	Village 11 – Smallholder mixed farming	Village 13 – Supported by Provincial Irrigation Unit	Village 14 – Supported by Provincial Irrigation Unit
Number of stages	11	11	12	12	14
Stage above which poverty line is drawn	6	6	5	6	6
Stage above which prosperity line is drawn	10	9	9	11	11
% households currently in poverty	44	18	23	19	33

Conclusions

One of the most important conclusions from this analysis is that there is no clear evidence of causal links between resource degradation, domestic water quality, domestic water quantity, and poverty. While other research has shown in the Nyando basin has shown large degradation of land and water resources over the last 25 years. Sediment loads in the rivers are high, much of the land area is severely degraded, floods are frequent, and sedimentation of the canal systems has contributed to the collapse of several irrigation systems (Mungai et al., 2004; Ong and Orego, 2002). Nonetheless, households in the 5 floodplain villages reported overall improvements in the quantity and quality of water available to them. Only in the National Irrigation Board village did more households indicate a reduction in water quality from 10 years ago to the present. Further analysis will need to be conducted to better understand the reasons for this apparent contradiction. The likely possibility is that villages in the Nyando floodplain have benefited from domestic water supply projects conducted outside of the main irrigation projects.

Another clear conclusion from the study is that poverty in the Nyando basin is generally concentrated in the lower parts of the basin that have greatest potential for irrigation. This geographic clustering of poverty in the lower parts of the basin contrasts with the standard situation in southeast and south Asia, but may be closely to the norm in East Africa. Failed irrigation development, particularly with large government involvement in agricultural production and local organizational arrangements (the NIB village), has been a source of impoverishment in the Nyando floodplain. Yet, the overall slight improvement in the poverty profile in the villages supported by the Provincial Irrigation Unit provide some evidence that irrigation development can contribute to welfare improvements. One of the key lessons from this study appears to be the importance of diversity. Diversification of livelihood strategies, at the household and community levels is a major source of welfare enhancement.

Results on water governance and gender equity in water access and management indicate that there has been some spillover of influence from irrigation management to management of domestic water sources. The village involved in the NIB irrigation scheme in particular noted the importance of the irrigation scheme and the government in mediating access to virtually all water sources in the village. The big difference between the NIB area and the other areas included in this study is land ownership. In the NIB area the government and the scheme are understood to be the owners of land on which water points are located; in the other villages the water points are located on individual land, but with relatively open access to other people living in the village. Results from elsewhere in the Nyando basin show that there is indeed a strong link between land ownership and water access.

Under the Water Act of 2002, water and irrigation management will for the first time be centralized in one government ministry, the Ministry of Water Resources Development and Management. This Ministry is re-assessing how best to re-vitalize the irrigation sector and improve access to domestic water sources. This research shows that land ownership is key. Farmers will be more apt to adapt to invest in land improvements

and diversity their income sources if they have secure land rights. The women who collect water will have more secure access to water points that are located on land with clear private or collective ownership.

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Hydronomics and terranomics in the Nyando basin of Western Kenya

Leah Onyango, Brent Swallow and Ruth Meinzen-Dick

This paper uses the concepts of hydronomics as systems of rules that define water management and terranomics as systems of rules that define land management and explores their linkages in rainfed agriculture and irrigation areas in the Nyando basin. The upper reaches of the basin have experienced a change from large scale commercial farming to more intensive small holder farming while in the flood prone lower reaches of the basin several irrigation schemes have been set up. The basin has a complex history of settlement, irrigation development and land tenure over the last 50 years, resulting in distinct patterns of poverty, land use, water management and land tenure across the basin. The changes in management of land have a corresponding effect on access to and use of water in the basin but there are no corresponding policy changes to ensure that no one is losing out.

Key words: hydronomics, terranomics, land tenure, settlement schemes, land buying companies, irrigation, dynamic property rights, legal pluralism

Introduction

The management of terrestrial waters is closely linked to the use and management of land. Until recent years, the land laws and the water laws in Kenya have developed along parallel lines without making adequate provisions for the links between land rights and access to water resources. This paper explores the links between water resource management systems (hydronomics) and land management systems (terranomics) in both rain fed agriculture and irrigation areas in the Nyando river basin. The term hydronomics is used to mean systems of rules that define water management and terranomics as systems of rules that define land management. The basin is occupied by two ethnic groups the Kalenjin in the highlands and the Luo in the lowlands. Each had their traditional ways of managing both water and land resources in the past. Over time statutory laws that cut across the cultures have been set up for managing the same resources. Traditional systems of managing the resources based on customary rights operate alongside statutory laws .This is described by Mienzen-Dick and Prandhan, (2002) as legal pluralism.

The concept of hydronomic zones

The term hydronomic is derived from two words, '*hydro*' for water and '*nomus'* from the Greek for a system of rules governing a specific field. The concept of hydronomic zones was developed by International Water Management Institute (IWMI) scientists David Molden, R.Sakthivadivel and Jack Keller to manage water for irrigation schemes. However it can also be used to understand water for other uses in a basin context. It is based on the assumption that all terrestrial fresh water use takes place in a basin context but within in basin different areas are likely to have distinct characteristics. The framework of hydronomic zones is an effort to deal with the differences. They note that water issues are site specific and water management strategies should be tailored to suit each zone in the basin. Consideration must be given to the characteristics of each zone in designing the strategies hence our characterization of the Nyando river basin.

Molden et al (2001) developed a set of six zones and defined them based on key differences in the different areas of the river basin. These are: 1) water source zones, 2) natural recapture zone, 3) regulated recapture zone, 4) stagnation zone 5) final use zone and 6) environmentally sensitive zone. The zones are defined based on similar hydrology, geology and topography. The hydronomic zones are also defined by where drainage water flows. There are two basic conditions. The first condition is where outflow can be re used and the second one is

where outflow cannot be re used .The two conditions are determined by geographic location in the basin. Water used in the upper reaches of the basin can find its way back into rivers and streams and be used again further down stream. In the lower reaches of the basin water used goes into a sink (the ocean) or becomes too polluted. *Natural recapture Zone* is the area of the basin where surface and subsurface drainage water are naturally captured by river systems or channel networks. *Regulated recapture zone* is any area of the basin where drainage can be regulated. Typical regulated capture zones are irrigated areas in the upper reaches of river deltas adjacent to coastal plains. If the drainage and underground flows are not captured they will flow into the sea. *Final use zone* is any area of the basin where there is no further opportunity for down stream re use. The water in the drains is of no value in productive uses. Final use zones fall at the end of the basin such as the lower delta in Egypt. *Stagnation zone* is any isolated area where the drainage capacity is insufficient for the removal of leached salts and excess water. They are characterized by water logging and salinasation. *Water source zone* is the area where excess precipitation provides runoff or ground water recharge for down stream processes. It is an important zone in the formulation of a water management programme. The water yield as a proportion of precipitation received in the basin and its sediment load are dependent on how the water source area is managed. Management strategies in the water source zone can affect water use in the whole basin. For example practices to decrease sediment load often decrease water yield. *Environmentally sensitive zone* is any area where there is a requirement of water for environmentally sensitive purposes. An example is a wetland.

Defining the hydronomic zones in the Nyando river basin

The River Profile

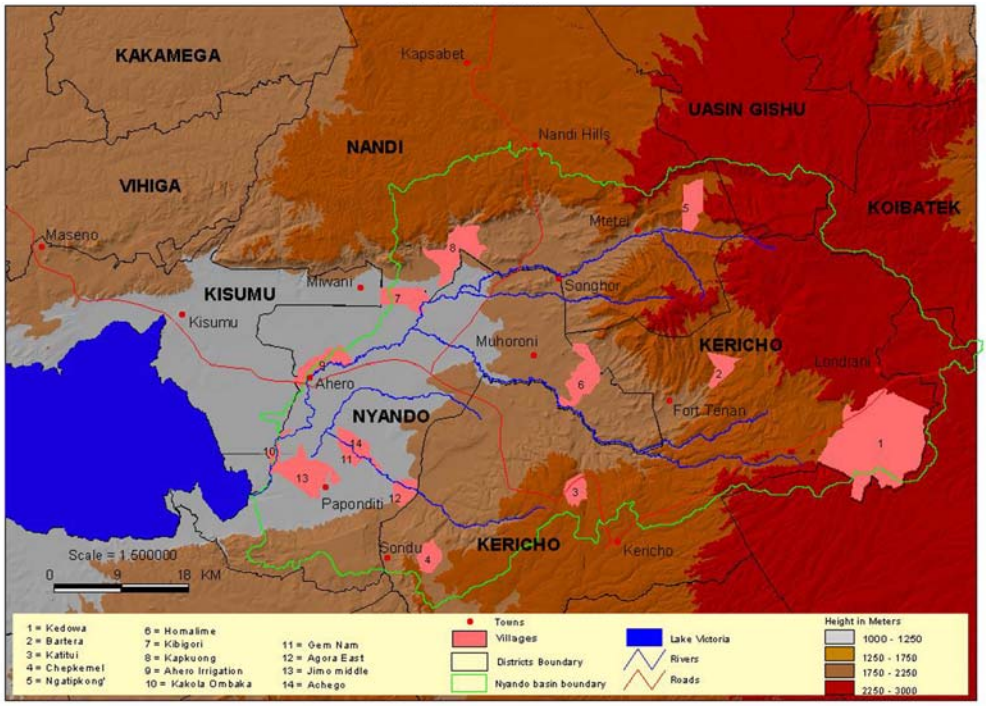
The river profile is a cross section of the river from the source to the mouth. All rivers flow from high ground to lower ground and the gradient is seen in the river profile. The activities of the river change along the river profile and these changes are a factor of the gradient. In the upper reaches of a river, the gradient is steepest and this is associated with fast flowing river water and high levels of erosion. The lower reaches of a river are flattest and are associated with slow moving river water, sedimentation and flooding. The river basin can be divided into three strata: up stream, mid stream and the down stream based on the river profile. Such zoning draws similarities with the hydronomic zones as defined by Molden et al (2001). Both zones are based on geographic position within water catchments.

Upstream

The upper reaches of the Nyando river basin lie between 1800 and 3000 meters above sea level. The rainfall regime is bimodal with the long rains in march/April/may and the short rains in September/October. Annual average rainfall ranges from 1200mm to 1600 mm. The annual average maximum temperatures range from 19 to 27 degrees centigrade. While the annual average minimum temperatures range from 5 to 12 degrees centigrade. The high altitude and high rainfall favor the growth of forests. Two indigenous forests the Mau forest and Tinderet forest found in this region are the source of the Nyando River. The region is also endowed with many springs which feed into the rivers. Due to the steep gradient of the terrain in this region, it is expected to have the highest level of erosion. Studies have identified the region as one of the erosion hot spots in the Lake Victoria basin (Walsh et al 2004). The forested areas here form the *Water Source Zone* while the adjacent descending regions would be the *Natural Recapture Zone.*

This zoning takes care of the biophysical dimensions of water management. It does not address the socio cultural aspects of water management such as the fact the people who live in the region have only moved in since independence in 1964. They came from all parts of Kenya there fore the region is not homogeneous in terms of ethnicity. Politics has stirred ethnic hostility and distrust culminating in tribal clashes in the 1990s.In a community with such diverse origin and a history of distrust statutory laws are stronger than customary laws. Private property rights are very strong. This is evident in the construction of barbed wire fences to keep away tress passers and the absence of free ranging for livestock.

The region has experienced dramatic land use changes in the last 40 years as the land converted from large scale farming to intense smallholder cultivation. In the same time period the population of the area has increased as people move in to occupy the subdivided farms. Nyaribari ‘A’ village in Bartera sublocation,



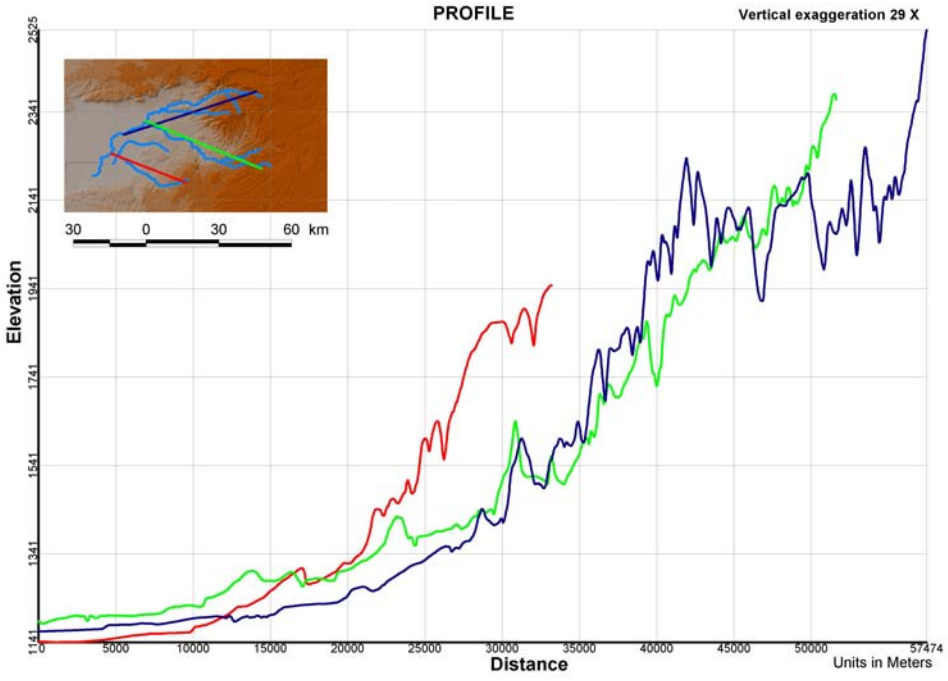


Figure 1. Nyando Basin

marked as 2 in Figure 1 was formerly Lelu farm (LR.1442/2). It was one farm holding owned and managed by one person. It was purchased by a land buying company (Nyagacho) that subdivided it and settled its members. Today Lelu farm makes up Bartera sub location with a population of 2810 people, 526 households and a density of 273 people per km2 (Kenya, Republic of, 2000b) .The impacts of these changes on the environment are seen in the emerging environmental problems such as deforestation and landslides. This study sampled three villages in this region located in Kedowa, Bartera and Ng'atipkong sub locations as shown in figure 1.The

use of land management systems as a criterion for zoning the basin can capture the socio-cultural and socio-economic dimensions hence our examination of terranomic zones to compliment the hydronomic zones in the basin.

Mid Stream

The middle reaches of the Nyando river lie between 1300 and 1800 meters above sea level and is characterized by gentle slopes. The annual average rainfall ranges from 1200mm to 1600 mm. The annual average maximum temperatures range from 31 to 27^0c. While the annual average minimum temperatures range from 14 to 9^0c. This area has both large scale and smallholder sugar cultivation. It also has small-scale tea in the higher altitudes. It is the transition zone between highland and lowland. It is also the transition zone between two ethnic communities; the Luo who are peasant farmers and fishermen live near the lakeshore and the Kalenjin who are livestock keepers and live in the highlands. There is cross boundary trade in this region between the two communities. There is also potential for tribal conflict. This makes these communities vulnerable. The region would fall in the *natural recapture zone.*

This study sampled five villages in this region .These are found in Ketitui (3),Chepkmel (4),Homalime (6), Kibigori (7) and Kapkuong (8) sub locations as indicated in figure 1.The first two villages are both exclusively Kalenjin speaking communities and growing smallholder tea. The following two are both settlement schemes that are predominantly Luo and grow smallholder sugar cane. The last one is a labor camp on a large-scale sugar plantation. It was invaded by one ethnic community as a result of conflicting land interests and politics.

Down stream

The lower reaches of the Nyando river lie between 1300 and 1000 meters above sea level. The soils are poorly drained because of the high clay content and the low gradient. The river is slow moving and carries a heavy silt load. Dominant river action is deposition and the region is characterized by flooding. It is the hottest and the driest region of the basin with annual average rainfall ranging from 800mm to 1200 mm, the annual average maximum temperatures ranging from 29 - 31^0c while the annual average minimum temperatures range from 12-16^0c. The natural vegetation is open scrubland. The region is flood prone and several rice irrigation schemes have been set up. Annual flooding near the delta leaves rich alluvial deposits that are cultivated and yield good harvests. The deposits also cause the river channel to shift. This has led to serious inter-clan conflict in the delta region because the river is used as a boundary and this boundary keeps shifting. The government is yet to find a lasting solution. In Kokola Ombaka (shown as 10 in figure 1) sub location the most valued fields are those found in the flood plains near the Nyando delta.

Irrigation in the basin is done under different systems. There is a National irrigation Board (NIB) scheme in Ahero irrigation sub location (9); In Jimo middle sub location (13) and Achego sub location (14) there are Provincial Irrigation Unit (PIU) schemes and in Agoro East sub location (12) there is self organized irrigation of horticultural crops. The lower reaches of the Nyando basin ft the description of the Regulated recapture zone. The many wetlands found at the mouth of the Nyando River form the Environmentally Sensitive zone

The concept of Hydronomic Zones is a planning tool. It enables one to define, characterize and develop management strategies for areas with similar characteristics. It has been applied in the Kirindi Oya basin in Sri Lanka, the Nile valley in Egypt, the Gediz basin in Turkey and the Bhakra area of India. The reason for separating basins into hydronomic zones is because each zone has its set of water saving strategies. It is not enough to save water. It must go hand in hand with improving the well being of man. Falkenmark (2002) examines compatibility of the goals of human security verses ecological security and concludes that emphasis must be put on balancing.

Catchments

The Nyando river basin has several sub catchments within it and these can be used to create water management zones. The use of water catchments for water resource management has been adopted by the Kenya government in its water sector reform programme. The Nyando river has three major tributaries; Ainabngetuny, Kipchorian and Awach each forming a water catchment. The Ainapngetuny and Kipchorian catchments cover the highest elevations of the basin. They are endowed with springs that feed into the streams which join the

main river. The Awach catchment on the other had is on the low-lying region of the basin where rainfall is low and temperatures are high. The bio physical conditions found in each region determine the possible options in terms of livelihood strategies. The use of catchments to create zones is based on hydro-geological considerations.

The Water Act 2002 is the main piece of legislation that is used to manage water as a resource. It vests all water resources in the state .The act provides an elaborate structure for water resource management based on catchments. It provides for the establishment of the Water Resource Management Authority (WRMA) which formulations a National Water Resource Management Strategy (NWRMS). Catchment areas are defined by WRMA in accordance with NWRMS. The Water Act 2002 also creates a Water Services Regulatory Board whose role is to regulate the utilization of water, rather than the conservation of water like the Authority.

Why Terranomic Zones?

Hydronomic zones as defined above are based on biophysical conditions and do not factor in the human environment. It is based on naturally occurring zones. To address the socio cultural and socio economic needs of man it is necessary to create another level of zoning to compliment the hydronomic zones. Land management systems do not occur naturally but are a response to socio economic and socio cultural requirements of a society or a government. Zoning a watershed on the basis of both water and land management systems takes care of both human and ecological security.

Property rights determine access to resources. There are multiple sources of authority that give people access to resources. The written law on land is usually clear .The written law on water is also usually clear. However issues of public access to water on private land are not. If water belongs to the government but it is on private land how do others access it or plan for it? How much access do others have to the river as it passes through private land? This study established that as land tenure changes so does access to water resources on the land. This acts as a driver for the dynamics of water use and management. It also established that as culture changes across the landscape so do livelihood strategies. For instance the life of a pastoralist is not the same as that of a fisherman or a rice farmer in an irrigation scheme. These changes also drive the dynamics of water use and management. In planning water management strategies for catchments it is important to take into consideration these differences keeping in mind that there must be a connectedness between upstream and downstream management for sustainability. Diversity in culture and property rights in catchments is a universal a phenomenon and this justifies their consideration in defining zones for planning purposes.

Defining the Terranomic Zones in the Nyando River Basin

The Evolution of Land Tenure Systems in the Nyando basin

Land in the Nyando river basin is held in different ways in different places and this has changed over time and continues to change. Most rural livelihoods in Kenya depend on agriculture therefore it is important to explore the ways in which land is held, how this has changed over time and how much access each land holding system allows the holder and in particular the poor in these communities. The existing land holding systems in the basin can be best understood in its historical context? The evolution is traced back to the colonial era. The Crown Lands Ordinance of 1902 gave authority to the Crown to alienate land. The Crown and not the local people had original title of the land. Any land that was not physically occupied by the locals was considered wasteland (free land) and free for alienation to the European settlers. The local people's right to land was defined by occupancy while the settlers were given free hold titles by the Crown. This set the stage for two parallel land holding systems. When the settlers required land that was occupied by the locals they had to negotiate for it and they did not like this because they felt a free hold title was superior to a right of occupancy. They advocated for grouping the Africans in definite reserves far removed from any lands likely to be suitable for European settlement. The Crown Lands Ordinance of 1915 allowed the Governor to create Native reserves and provided for the settlers to be given agricultural leases of 999 years instead of free hold titles. Following the Kenya Land Commission (Carter Commission) of 1934, the Native Lands Trust Ordinance of 1938 re designated Native Reserves as Native Land and removed them from the Crown Lands Ordinance. This created a set of laws to govern native lands and another set to govern crown land. Even after independence both sets of

law were still in force explaining the current state of confusion in land administration. The Native Land Trust Board under the Chief Native Commissioner held native land in trust for the communities. The local people lost all their rights to lands outside of the native lands. The Crown Lands Ordinance was amended to define the highlands, which were administered by a Highland Board. Both boards and their boundaries were set up by 1939 and remained the same up to the time of independence. The highlands are commonly referred to as the white highlands. They were often the most productive parts of the country and developed cash economies whereas the native lands were often the less productive and developed subsistence economies. These patterns that were developed in the past era have persisted to date.

This study identified six ways in which land is held in the basin : 1) Trust land-not titled; 2) Government land-not titled; 3) Adjudicated land-freehold titles on completion of adjudication;3) Settlement schemes-freehold titles on discharge from the Settlement Fund Trustee (SFT); 4) Large-scale farms-lease hold titles; 5) Land buying companies-free hold title on subdivision to small units, 6) Forest land-reservations on gazettement. For purposes of analyzing the evolution of tenure in the basin, this study has generated a map of land tenure in 1964 (figure 2) when the country got independence and one of land tenure in 2004 (figure 3). Using the two map products it is possible to examine the changes that have occurred in the last 40 years and how this has impacted on the lives of the affected communities and on the environment.

Trust land

Public land in the *native lands* is held in trust for the people by the local authorities and is referred to as trust land. Before adjudication was done all land in the native areas were trust land. In the Nyando basin there are three county councils; Nandi county council, Kipsigis county council and Nyando county council. There are also several municipal/town councils. All trust land that is not alienated for a specific use is held in trust by these local authorities. However a survey of the three county councils established that most trust land in the basin has been alienated .What remains under the jurisdiction of the county councils today are schools, cattle dips dispensaries and a few wetlands (Dobbie.W and Onyango.L, 2003).

Access to water in trust lands

Trust lands are areas of open access. People living in the same community have equal access to all water resources found in the trust lands. There are exceptions when people from an outside community try to access the resources. They are not refused access but the locals are given priority especially if the commodity is scarce.

Government land

At independence all crown land converted to government land and was administered by the commissioner of lands on behalf of the president. All government land that is not alienated is still held in the same way. No one has any right to use or occupy it unless granted a lease by the government. However it is common to find unofficial users of these lands who are thrown out when the land is officially allocated. In the Nyando basin such land is found only in the urban centers such as Kericho and Muhoroni.

Access to water on government land

Although government land is not free for use, there is no one who watches over it before alienation so water resources on it are often unofficially available to all. There is very little government land in Kenya because most of the land has been allocated for private developments. In towns there is very detailed land use planning and the riparian reserves are planned and designated as *riparian reserves* and not allocated for any other use. Ideally the local authority should be the custodian but they rarely take up the responsibility so on record they remain government land. It is evident in all major cities of Kenya that these are the areas where slums sprout.Kibera slums along the Ngong River in Nairobi is one of the largest slums in Africa. Other slums that have developed on riparian reserves in the city of Nairobi include Mathare, Mukuru Kayaba, Mukuru Kwa Njenga, Ngomongo and Korogocho.In the nyando basin towns like Muhoroni and Ahero with rivers flowing through them are already showing similar trends. One very negative impact of the open access to the riparian reserve is that the rivers in towns are recipients of refuse form both people and industries.

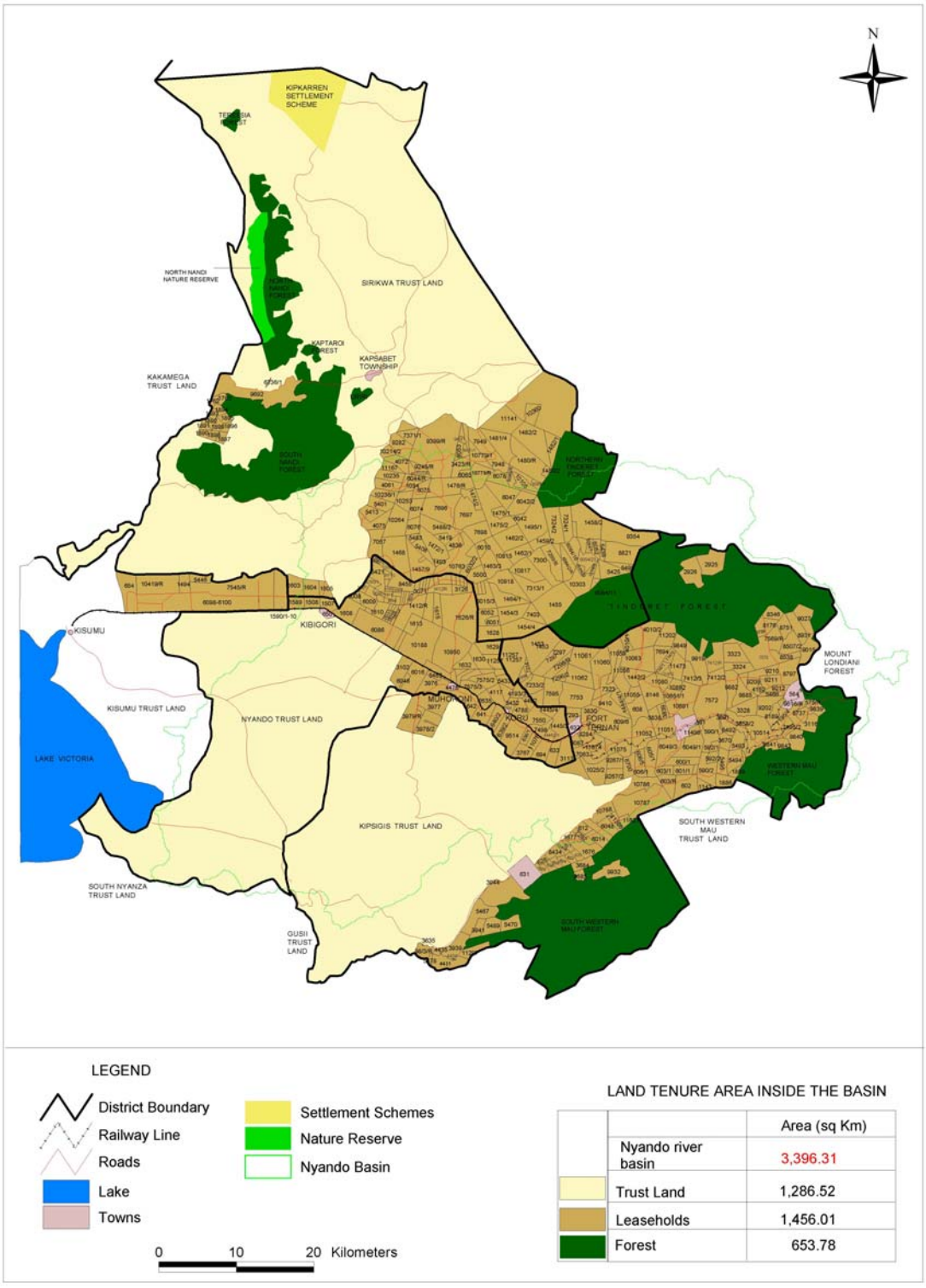


Figure 2. Land tenure, 1964

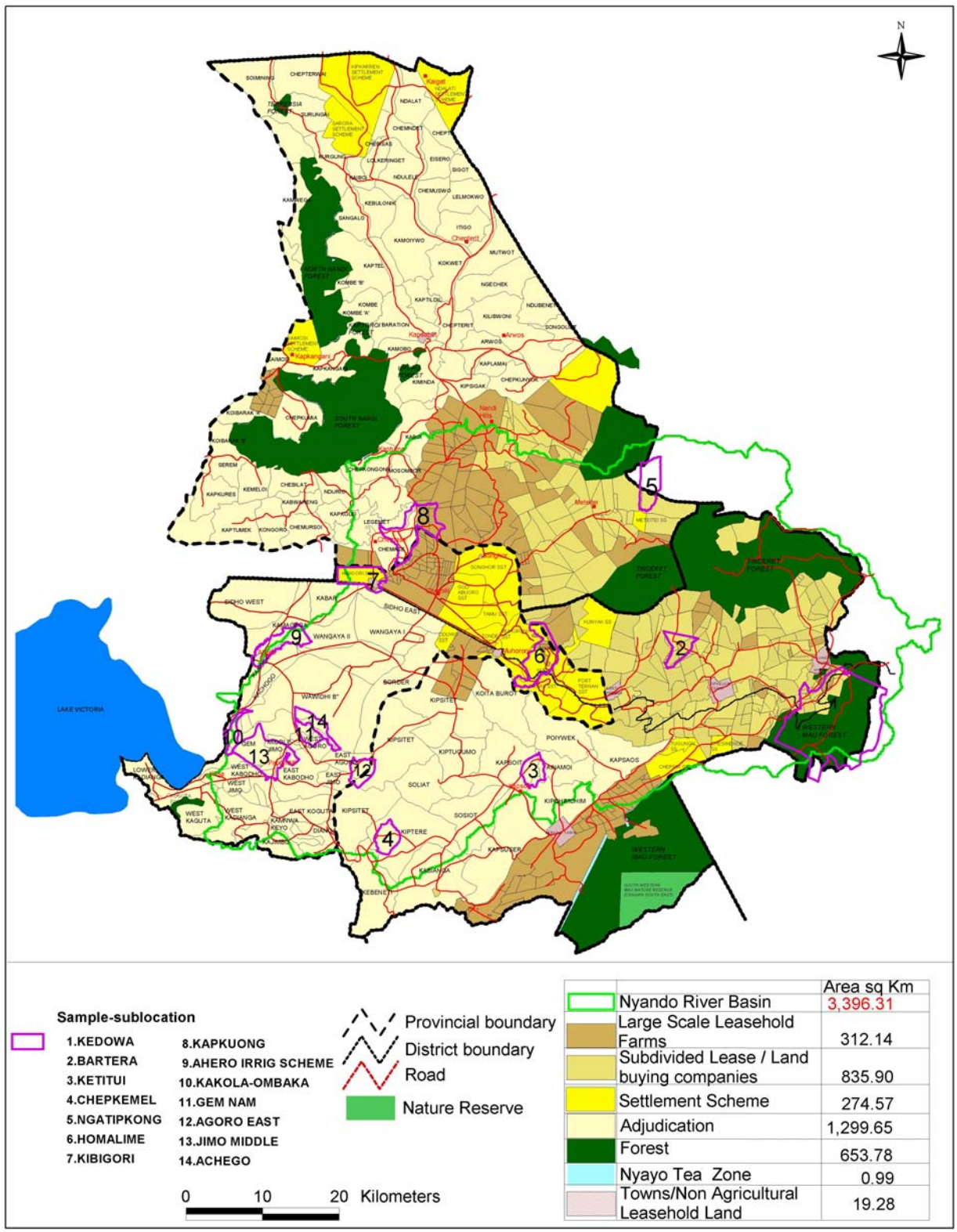


Figure 3. Land tenure, today

Adjudicated land

Land adjudication is the process through which land in the native reserves is surveyed and registered as a free hold interest. This process started in 1956 in some parts of central Kenya but was widely implemented only after independence. The process of adjudication was slow because it had an inbuilt mechanism for hearing and determining disputes and in many instances it included land consolidation. The land holding system in the native lands encouraged the people to have small parcels of land in different places. This was sound ecological reasoning because it spread out risk and benefit but it reduced the economies of scale in cultivating these pieces of land. In some areas consolidation was achieved but in others the people resisted it. On completion of adjudication a freehold interest is registered and a title deed issued. The process of adjudication was prompted by the Swyennerton plan of 1954 as the colonial government looked for ways of improving agricultural production in the Native lands. It recommended that this could be achieved if titles were issued to the Africans for the land they cultivated. The government was to provide loans for improving agriculture using the titles as security. Despite these efforts the economies remained predominantly subsistence.

Adjudication sections are curved out along ethnic lines and are homogeneous in terms of ethnicity. As a result property rights are heavily influenced by culture. An examination of the adjudication registers yielded very few female names. The implication is that women hardly ever own ancestral land. However examination of the land registers in the settlement schemes and the land buying companies yielded increasing numbers of female names. The study sampled seven villages on adjudicated lands. These villages are located in Ketitui (3),Chepkemel (4), Kakola Ombaka (10), Gem Nam (11), Agoro East (12), Jimo Middle (13) and Achego (14) sub locations as shown in Figure 3.

Access to water in adjudicated areas

Land adjudication is followed by survey to establish the boundaries and thee area of a parcel of land for purposes of registration. The process did not take care of a riparian reserve. It used the river as a boundary and did not give it any width. This had the effect of privatizing the riparian reserve. Anyone whose land did reach the river did not get access to the riparian reserve. Since the river was drawn as straight line it was part of the two pieces of land on either side. Public access to the river was at the bridge where the road and the river meet. All adjudicated land is former ancestral land and is subject to customary laws. Customary laws dictate that no one should be denied water. Even the hyena, the least respected of the animals has a right to water.(derived from Kalenjin saying) Because of this belief, people will let others pass through their private property to access river water even where there is no official road. The lack of fencing which is characteristic of adjudicated land makes it possible to create and use short cuts. When the river water is harnessed for a piped water supply two methods can be used to secure passage through private land. The safest and most secure is to obtain an easement or a way leave, which will allow the pipes to officially pass through private property without interference from the registered owner. This is provided for in the Way leaves Act Cap.292.The other alternative, which is often used, is to seek verbal permission from the owners of the land through which the pipes will pass. Because water projects serve many people and because the customary laws dictate that no one should be denied water, this approach works but it is not secure. In the event of any of the people falling out with the rest, then he can cause a lot of trouble.

Springs as source of water were also not taken care of in the adjudication process. As result all springs in adjudication areas fall on private land. There is no official road leading to the springs and people use the roads passing closest to the springs and where the roads end they pass through private land. No one denies other members of the community water from the springs. However of late access to the springs is getting more restricted as people get more individualistic. Many water projects around springs still do not enter into any legal or written agreement with the landowners on which the springs are found. This study established that most water project around springs in the basin relay on customary laws to secure rights to the springs. (Kipsiwo and Kiptegan spring protection and water supply among others)

Settlement schemes

Settlement schemes are a deliberate effort by the government to resettle landless people and at the same time improve agricultural production. At independence the government set up a scheme to transfer land in the white

highlands to the African farmers. This was done in several ways. One of these was through the Settlement Fund Trustee (STF) that paid off the white farmer; planned and subdivided the land then settled African farmers on it. SFT allocated the land on loan and registered a charge with the Permanent Secretary in the ministry of lands. When a farmer paid off the cost of the land he obtained a discharge of charge from the permanent secretary in the ministry and lands and registered a free hold interest in his favor. SFT also provided the farmers with a loan for working capital. The settlement schemes (Koru, Oduwo, Muhoroni, Songhor, Tamu) in Nyando district fall in the mid altitudes and were set up to promote sugar cane farming. Three sugar factories Miwani, Chemelil and Muhoroni were put up to process the crop. The cash economy that had been started by the white farmers was continued. In Kericho and Nandi Districts there are fewer settlement schemes and none of them promoted a specific crop. People who settled the schemes were not necessarily of the same origin there fore cultural ties were weak.

Access to water in the settlement schemes

Settlements schemes were a creation of the government and although a lot of planning was done in other aspects of land use they did not take care of the riparian reserve. This can be blamed in part on legislation under which the land was registered. It did not state clearly the width of the riparian. The river was used as a boundary once again letting the riparian reserve fall in private land. The government involved professional land use planners who took care of springs dams and swamps as sources of water. They were identified surveyed and reserved as Special Plots (SP) to be held in trust by the local authority for the community. The land reserved was substantial to allow for the catchments protection and conservation. Due to the lack of a focused land policy some of these special plots were recently allocated to individuals because they were large enough to farm.

Large-scale leasehold farms

Large-scale farms are found only in the former white highlands and are operated as commercial enterprises. All large-scale farms hold 999-year leases from the government. In the higher altitudes are tea plantations and in the mid altitudes are the sugar plantations. Multinational companies operate most of the tea plantations but most of the sugar plantations are locally owned. There are factories located within the region to process both sugar and tea. The large-scale farms are labor intensive and source their labor from both near and far. Those from far are provided with housing in the labor lines. Some do not live in the camps but are allowed to put up temporary homes on the un-cultivated portions of the land. Over the years there are people who have lived on the plantations to the point where they have lost touch with their lands of origin. These are second and third generation laborers whose grandfathers moved to the large scale farms to work for the white settlers. Today they are posing a problem to the plantation owners because they feel they too are entitled to own land in the area. Several of the large-scale farms have had to excise portions of their land to settle the “squatters” as they are popularly known. These excisions are converted to freehold interests. The tea estates that have made attempts to settle the squatters include Siret, Kapchorua, Kapsumbeiwa, Kibabet, Savani, Sitoi, Kaitet, and Sara Boit tea estates.

Access to water in the large scale farms

The operations of the large scale farms are strictly guided by the statutory laws. Water resources on the plantations are accessed by authorized persons only. Their environmental management is exemplary and their water sources well protected. The riparian is conserved as riparian and the natural vegetation left intact. Most have employed environmental officer in response to the governments increasing concern about environmental protection and its implementation of the Environmental Management and Coordination Act. of 1999.

Land-buying companies

This is a phenomenon that emerged after independence as a result of land transfers in the white highlands. There were several modalities in this transition. The government was not able to purchase all the land from the white settlers who wanted to sell. It therefore allowed them to negotiate sale agreements with anyone who was willing and able to make an outright purchase. Very few Africans were in a position to do this so they came together to form land buying companies or cooperatives. The members contributed money for the purchase of land and were allocated land worth the value of their share contribution on subdivision. There were no rules restricting membership in the land buying companies and this led to problems. Some companies had so many

members that they were not able to settle all the members so people lost their money. At other times they were allocated very small parcels of land. They also did not pay much attention to the provision of public utilities so they were poorly provided for despite the increases in population. Little professionalism was applied in preparing subdivision plans. As a result people were allocated land on very steep slopes, swamps, riverbanks, hilltops etc.Many times this was their only piece of land so they settled and worked it at the expense of the environment. Most of the land in the upper reaches of the Nyando river basin was bought by land buying companies. On subdivision the land converted to freehold and the members of the land buying company were each issued with a free hold title Property rights are dynamic and policy makers must keep abreast with these changes so that no part of society loses out.

Many land buying companies still have not issued their members with their title deeds to date e.g. Kotetni farm in Chilchula division of Kericho district which was purchased in 1968. People were allowed to settle the land before they completed the process of subdivision and issuance of title. The members were in the meantime issued with share certificates as evidence that they had a right to a share of the land. These certificates were inadequate because they only indicated that a member owned shares but did not say the location. The companies took very long to process the documents and sometimes the final survey numbers did not tally with the actual position members had already settled on. Corruption and lack of accountability were rife in the workings of the land buying companies. In some instances the president had to intervene for the title deeds to be issued. Such appeals are common in the daily papers.

Access to water in Land buying companies areas

The processes of subdividing the large scale farms was spearheaded by the private sector. They wanted to get as much land as possible to give to their members so they did not spare any land in the riparian reserves. People who formed the land buying companies come from different places so their cultural ways were not always the same. This implies that customary laws take a back seat in this scenario. The people tended to rely more on the written laws. Properties were fenced making the distance to the river longer because people had to revert to the officially prescribed road. People living in these areas relay more on written agreements as opposed to the verbal arrangements that are common in the ancestral lands. Springs in this region suffered the same fate as the ones in adjudication areas. No provision was made for them to be accessible to the public. They all fell on private land. Access to them is not as easy as is the case of ancestral land because here privacy of property is adhered to. Fences are more and are of barbed wire unlike eco friendly fences grown in native lands

Forest reserves

The Crown Lands Ordinance that established the native reserves was the same that made provision for the established forest reserves through gazette notices. Once land has been gazetted as forest reserve it cannot be put to any other use unless it is de- gazetted through another gazette notice. Forests in the basin include Tinderet forest, North Tinderet forest, Londiani forests and West Mau forest. The gazettement of forest reserves displaced the forest dwellers such as the Okiek/Dorobo .Many of them are landless or living illegally on the fringes of the forest as was the case in one of our sample village Ngendui in Ng'atipkong sub location (5).The government prohibits entry into the forest yet the way of life of forest dwellers dictates that they must access the forest. They have customary claims to forest and tree resources. A forest dweller out side the forest is like a pastoralist without livestock but statutory provisions do not safeguard their rights to these resources. In the past the communities bordering the forest were allowed to grow crops in the forest as non-resident cultivators (the shamba system) but this was abused and subsequently abolished by the government. The Nyayo Tea Zones were established on forestland to create a physical buffer zone between the forests and neighboring human settlement.

Access to water in the forest land

Water sources in the forest are not easily accessible due to the government policy that aims to keep people away from the forests. The forests are guarded by forest guards who often harass the local people. However the forests are a sources of many springs whose waters never ran dry even at the height if drought.Kaminjeiwa village in Kedowa sub location (1) is a forest frontier community and here the most permanent and the cleanest sources of water are in the forest. The people use these sources although they suffer constant harassment from the forest guards. Ngendui village is inhabited by forest dwellers and sits on the fringe of forest land. In this village the livestock and the people water from the same point. Crops are cultivated up to three meters from the

eye of the spring and despite being on forestland almost all the trees have been cut down. The people have no incentives to protect or conserve the water resources because of the insecure nature of their tenure.

Ethnicity

The Nyando basin sits astride two ethnic communities; the Luo and the Kalenjin.The Kalenjin are found in the upper reaches of the basin (Nandi and Kericho districts) and are livestock keepers. The villages in this study that are Kalenjin speaking are Kaminjeiwa (V1), Kiptegan (V3), Chepkemel (V4) and Ngendui (V5).The Luo are found in the lower reaches of the basin (Nyando district) and are predominantly peasant farmers and fishermen. The villages covered by this study that fall in the Luo speaking region of the valley are Kimira Aora (V7) Nakuru (V9), Kasirindwa (V10) Karabok (V11), Miolo (V12), Kasiwindhi (V13), and Awach Scheme (V14).Mixed ethnic groups are found in the settlement schemes like Ongalo village (V6) and in labor camps like Poto Poto village (V8). In areas where there were land buying companies there is also a mix of ethnic groups like in Nyaribari'A'village (V1).The significance of the ethnic groupings is that areas occupied by one ethnic group exhibit strong customary laws and vice versa. Ethnicity can therefore be used to create strata for management of water resources because it defines levels of cohesion in a community and addresses the socio-cultural aspects of water management.

Agricultural production systems

The farming systems in the basin are divided into three broad categories; large-scale commercial farming (tea and sugar plantations), irrigation agriculture (rice irrigation under the National irrigation board and the Provincial Irrigation unit) and small-scale mixed farming (cash crops/subsistence crops /live stock). This zoning is determined by both biophysical factors such as rainfall, soil fertility, temperatures etc; human factors such as access to productive resources (e.g. land) and the cultural values and practices. The agricultural production systems in the basin are a reflection of both hydronomic and terranomics.

Property rights and legal pluralism in the Nyando river basin

The analysis of hydromic and teranomics in the basins brings out issues of property rights in each of the strata created. The upper reaches are either large scale farms or have been taken over by the land buying company so there are no cultural ties. Multiple sources of authority still exist but the statutory ones are the strongest. The cash economy that was created by the settlers is still evident and this promotes statutory laws. Customary norms do not expect you to prosecute your brother/neighbor even if he lets his goats eat your crops year in year out. This does not promote a cash economy. This attitude is reflected in the management of all resources. The lower reaches on the other hand are ancestral lands and people are held together by culture so statutory laws are applied only when they must. Many activities are done as a way of life without calculating optimum levels of production and sharing is encourage since every one is his brother's keeper. This makes it difficult to accumulate wealth-a possible explanation for the high incidence of poverty. Poverty is not shunned but is accepted as something that everyone in society must experience at some point in their life. No one is expected to be always rich. It is summed in a saying "*inind diere inind tung*" loosely translated means that today you sleep between the others and you are keep warm and safe but tomorrow you will sleep on the edge where no one will shield you from the vagaries of life-even if you are not poor today you get there some day. The lower reaches of the basin are not well endowed with natural resources so it may be that people who have lived there over the years have come to accept the inevitability of poverty. The middle reaches of the basin are transitional areas both socially and physically.

The institution of the chief and the villager elder is a point where customary law and statutory law merge. The chief in the rural setting is always a local person and well versed with the customs of the people .He works with village elders who not only know the customs but also know the families. Many issues are resolved at the level of the chief and his village elders. Where it has to go beyond them to the courts of law, then cultural rights are represented by the chief. In this way non statutory laws blend with the statutory. Land cases are common areas where this has been is applied in the basin.

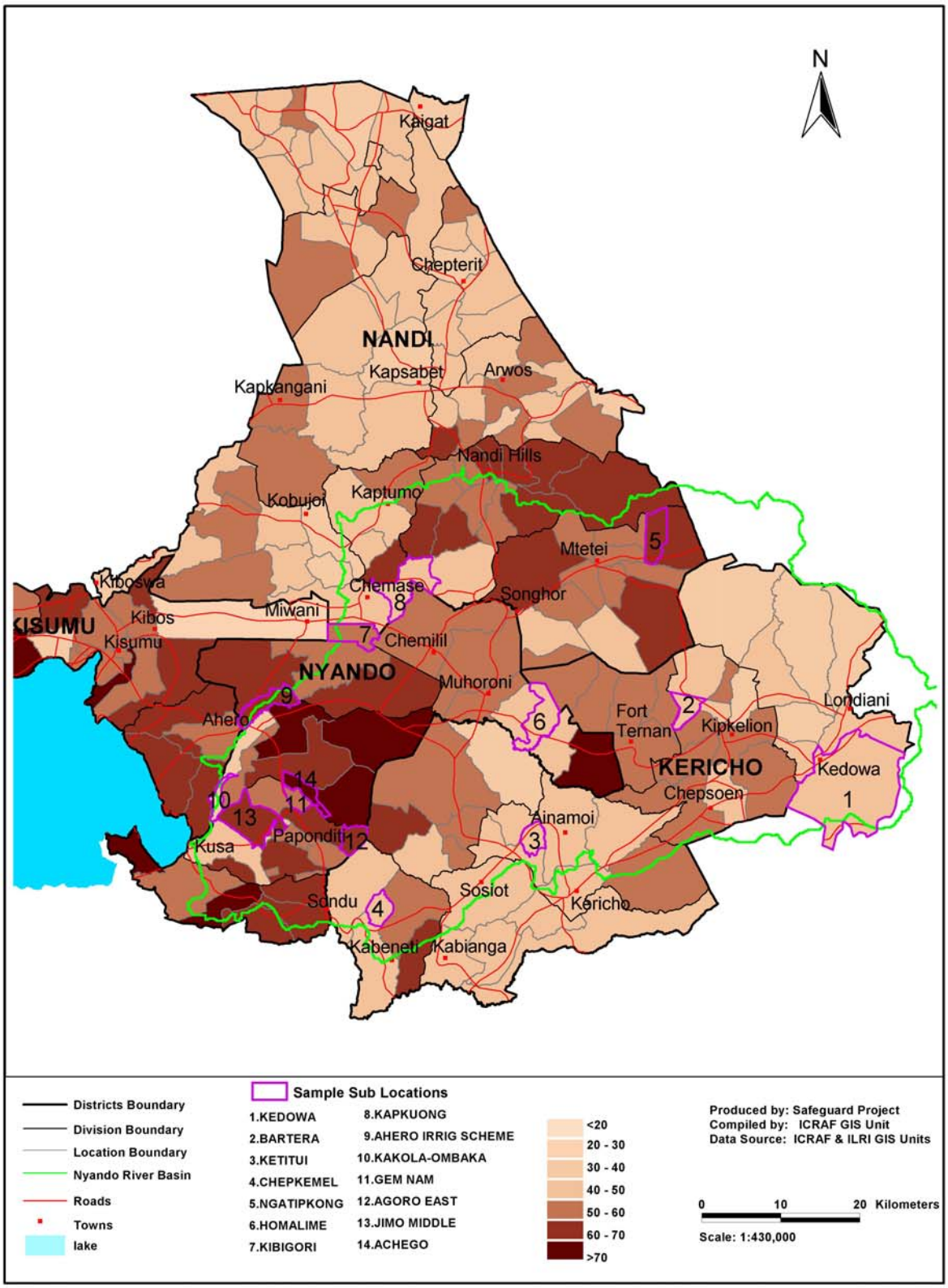


Figure 4. Percentage of rural population below poverty line

Table 1. Nyando river basin; poverty dynamics (poor now/ poor 25yrs ago)

Village code	Village name	Name of sub location	Total number of poor (25yrs ago)	Percen -tage %	Total number of poor (now)	Percen -tage %	Change	%
V1	Kamenjeiwa	Kedowa	1	2	1	1	-	1
V2	Nyarybari A	Bartera	0	0	5	18	+	18
V3	Kiptegan	Ketitui	20	16	6	4.69	-	11.3
V4	Chepkemel	Chepkemel	0	0	12	16.4	+	16.4
V5	Ngendui	Ngatipkong	10	20	19	37	+	17
V6	Ongalo	Homalime	5	7	18	25	+	18
V7	Kimira-Aora	Kibigori	1	1	21	22.8	+	21.8
V8	Poto poto	Kapkuong	1	1	9	10	+	9
V9	Nakuru	Ahero Irrigation	24	34	44	62.9	+	18.9
V10	Kasiwindhi	Kakola Ombaka	2	3	18	28.6	+	25.6
V11	Karabok	Gem Nam	9	9	23	22.8	+	13.8
V12	Miollo	Agoro East	35	35	57	56.4	+	21.4
V13	Kasirindwa	Jimo middle	20	39	19	37	-	9.5
V14	Awach scheme	Achego	41	47	33	37.5	-	9.5

Source :The Safeguard project

Patterns of poverty and land use across the basin

Figure 4 is generated from data obtained from welfare monitoring surveys using conventional measures of poverty. It indicates the levels and patterns of poverty across the basin. Table 1 is derived from non conventional measures of poverty obtained from a survey of 14 villages in the basin through participatory approaches. It indicates the incidence and the dynamics of poverty in the basin. The two sets of information point to higher incidence of poverty in the lower reaches of the basin. The survey also established that although the rice irrigation schemes produced a cash crop the rice irrigation areas still experienced high incidents of poverty. Communities with insecure tenure had some of the highest levels of poverty in the basin. Poverty dynamics in the lower reaches is driven more by the terranomic whole in the lower reaches it is driven by hydronomics.

Relevance of hydronomic and terranomic zones to poverty reduction and resources management in Kenya

Reducing of poverty is one of the major challenges of this century and there are many global initiatives that have been started to this end. In Kenya several approaches are being taken to address poverty. These include: 1)

District Focus for Rural Development and District Development Planning. Hydronomic and terranomic zones are about natural resource management and can be used to design strategies that become part of the District Development Plans; 2) *Catchment management strategies*. The Water act 2002 provides for the management of water as a resource within the context of catchments. The concept of hydronomic zones can be used as a tool for planning the catchments; 3) *Environmental Planning.* The Environmental Management and Coordination Act of 1999 established the National Environment Management Authority (NEMA) as the principle instrument of the government in implementation of all policies related to the environment Every five years NEMA must produce a National Environmental Action Plan (NEAP) a Provincial Environment Action Plans (PEAP) and District Environment Action Plans (DEAP) .The concept of hydronomic and terranomic zones can be very useful in meeting some of the objectives of environmental planning; 4)*Land use planning/physical development plans.* The Physical Planning Department in the Ministry of Lands is given the mandate by the government to develop guidelines to control the spatial aspect of development The concept of hydronomic and terranomic zones can be used in regional planning.

Conclusion

The link between access to land and access to water resources must be addressed by policy makers in order to safeguard equal access to water resources for all especially for the poor. Property rights are dynamic and policy makers must keep abreast with these changes so that no part of society loses out.

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Notes

1. The Safeguard project. This is an acronym for a collaborative project between Maseno University ICRAF, IFPRI, ACTS and IWMI –"Safeguarding the rights of the poor to critical water land and tree resources in the Nyando River basin"

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Getting access to adequate water: community organizing, women and social change in Western Kenya

Jessica L. Roy with Ben Crow and Brent Swallow

This paper presents initial findings from research exploring the influence of community organizing and gender relations on access to water in Western Kenya. Improved access to water promises significant progress in the lives of many of Africa's rural and urban poor, but few rural communities in Africa have been able to self-organize to significantly improve their access to water. This research seeks to illuminate the social conditions, rights and practices that may hinder or facilitate community organization to achieve better access to water. Two particularly intriguing findings emerge: 1) amongst a wide range of social conditions that hinder the founding of water projects is a hint of male anxiety about how women may use time saved from water collection, and 2) in one community where the obstacles to organizing were overcome, and a successful piped water system installed women, were able to use their time saved from water collection to enhance household tea production and establish a group that has generated new income from casual labour and the production and sale of new crops.

Key words: Africa, women, gender, water, time allocation, livelihoods, community organization, collective action

Jessica Roy died in Nairobi in August 2004 after being struck by a car while walking home from work. This paper presents initial findings from her research on community organizing to improve water access in Western Kenya.

Introduction

Improved water access promises significant progress in the life of many. Unsafe and insufficient water means sick children, unhealthy food, infrequent clothes washing, little milk from cows, few vegetables in gardens and sparse fruit on trees. It also means hours and hours spent climbing up and down hills carrying heavy loads. The brunt of this burden of poor health and heavy labour is born by women.

So far, few rural communities in Africa are able to improve their water supplies. The technical means for improving access to water are relatively simple, but the social arrangements are not. Negotiating old, and constructing new, water rights and practices may provide a way forward.

This research seeks to illuminate three aspects of improved water access. The first concerns *water governance*: How do effective water organizations arise and with what participation by users? The second is focused on *water and livelihoods*: How does access to adequate water affect the way that people earn a living and the quality of their lives? The third question relates to *resource rights, gender and equity*: What is the relationship between the water and land rights of men and women and participation in the management, maintenance and use of water systems?

The study was designed to focus on four pairs of sites in Western Kenya. Two pairs of sites are in the upper Nyando River Basin, an important drainage of Lake Victoria. In this basin of 3,500 km^2 with average annual rainfall between 700 and 1500 mm, there are high levels of poverty, agricultural production is falling and much of the land is severely degraded (Swallow et al., 2001). The other two pairs of sites are in the adjacent Lare Division which has more erratic rainfall and frequent droughts. Communities in Lare Division identify water shortage as a critical problem (ICRA 1997 in Tuitoek et al. 2001). Households in the Nyando Basin say that water management is a primary concern of men, women and children (Swallow, forthcoming).

Two main water technologies are being used in these two areas. *Spring protection* places concrete tanks at the site of natural springs, some of which have pipes to carry water to individual and collective users. *Rainwater harvesting* collects rainwater for year-round use in tanks, ponds and behind small dams. Some individuals in those areas are using other water technologies such as drip irrigation, rooftop catchment, pump irrigation and boreholes.

This paper is organized as follows. First there is a section on the methodological innovations shaping the research. Then there is a large section summarizing early findings from the research. This section starts by describing what we have learned about water collection times, water sources and the very limited role of government in rural water supply. Then, there is a discussion of the obstacles standing in the way of community organizing to improve water supply. From this description of obstacles to organization, we turn to several sections describing cases of effective community organizing. Finally, the last section of this paper seeks to summarize what has been learnt so far.

Methodological innovation

Four noteworthy innovations in research method emerged in this study. These innovations relate to the way that this study was nested into a larger project, the selection and pairing of communities, the interlocked phases of the research, and a method of generalizing from community case studies.

To ensure that findings from this study would complement other research and development in the area, the study was integrated into larger project contexts. Four of the study sites were linked with the Safeguard project being undertaken by ICRAF, Maseno University and IFPRI in the Nyando basin (also see papers by Swallow et al and Onyango et al presented at this symposium), while four other study sites were linked with the SEARNET water harvesting network being led by the Regional Land Management Unit (RELMA) of ICRAF.

To explore and illuminate factors facilitating and hindering successful community organizing, the study identified *paired communities* facing similar opportunities and constraints. One community was identified where the community had been able to adopt water improvement technology. A second community with similar ecological and livelihood conditions was identified where such water improvements had not been adopted. This pairing of communities allows comparison of the process of community organizing in one neighborhood, and decisions not to organize in the other. This method provides some of the insights of control group procedures widely used in epidemiology and natural science experiments.

To uncover social processes, networks, ideologies and constraints, this study proposed *three phases* of research, of which only the first two have been undertaken so far. The first phase concentrates on interviews with key informants, including government agricultural, water and irrigation officers at several levels, chiefs and village elders, and community leaders interested in the areas of study. The second phase of research brings groups of individuals together for discussion. Some groups included women and men, some just women. Some groups included representatives of a range of ages, so that young and old, women and men would be heard. The third phase of the research, which has not yet been undertaken, involves interviews with stratified random samples of households. Alongside household interviews, in this third phase, time allocation studies will be undertaken, using diaries and observation, to estimate how much time each member of the household takes to collect water. Each phase of research is intended to inform the next. So, for example, key interviews in the first phase inform the questions asked in group discussions in the second phase. Issues identified in phase 2 group discussions inform both the questions to be asked in household interviews and the method of stratifying samples (women, men, rich, poor, members, non-members) most likely to be informative.

One of the recurring issues faced by social science research concerns *generalizing* from small samples. Sometimes small, qualitative studies are dismissed as anecdote. Frequently, however, the stories emerging from such case studies provide hypotheses generating larger research programs. In this research, it is intended that case studies of a small number of communities be matched with quantitative surveys allowing the generality of

the findings to be investigated. Thus, for example, the spread of rainwater tanks and spring protection can be investigated using satellite imagery and geo-referenced on-the-ground surveys; hypotheses about the involvement of women in new water associations can be investigated with straightforward questions to a larger sample of communities. In other words, it is intended that small, exploratory case studies be followed by larger surveys establishing the extent of intriguing case study findings.

Early Findings

In this paper we report some preliminary findings from key informant interviews in phase one of the research, and some group interviews of phase two. For the most part these findings are taken directly from Jessica's field notes. Some context for the study of successful community organization is provided by results from the Safeguard project from the same community.

Initial findings illuminate three aspects of rural life. First we have estimates of the time that women and children spend collecting water and description of the water sources they use. Second, there are intriguing insights into the formation of a successful water users association alongside some glimpses of the reasons why such associations may not be formed elsewhere. Third, there are accounts of the positive influence of improved water access on health, livelihood and social conditions.

Water collection: times, conditions and the role of government

> *Who thinks about water, mostly?:* "The women – water collection is their role, their job….Most of my work involves water." (Ngendui group discussion)

In the community of N'atipkong/ Ngendui, women report spending an average of three and a half hours each day collecting water during the dry season and double that (because hillsides are slippery) in the wet season. They used between 40 litres (elderly women) to 100 litres of water each day. Eight women from this community provided estimates of water quantity collected and time taken (Table 1). This suggests weekly water collection times of almost 25 hours in the dry season and nearly 50 in the wet season.

In the community of Kiptagan, where piped water has been introduced, women recall devoting 13 to 22 hours per week collecting 3 to 4 jerry cans of water per day before the water project. "Those who are connected to a piped water system," they reported, "*save an average of 15 hours per week. We can now use this time on economic activities."*

Children also collect water, particularly at weekends, but they take longer, because they play at the water source, and collect less, 10 litres instead of 20 per trip. Nevertheless, the woman or women of the household have less to fetch when the children collect some.

For comparison, it has previously been reported (World's Women 2000 reporting data from the UN statistical office), that water collection times for villages in Kenya average just over four hours, in the dry season, and two hours in the wet. The same source reports times in the range of four to six hours in Burkina Faso, Botswana and Cote D'Ivoire. Water collection times of 17 hours per week are reported for Senegal and 15 hours for the dry season in Mozambique. Thus, the water collection times reported for Kiptagan (15 hours) and Ngendui (25 to 50 hours) are similar to, or higher than, the highest averages reported for Africa. Preliminary results from the Safeguard household survey from these and other villages indicate much lower amounts of time spent collecting water. Obviously, more detailed analysis and measurement will be needed in future studies.

Lists of springs, rivers and other water sources available to the community, the problems of each water source and how many families use them, emerged from discussions with groups of water users and with the Divisional Agricultural Officer. Amongst problems reported were: contamination by livestock and by fertilizer, rising rates of typhoid from water contamination, soil erosion blocking water sources, and the difficulty of protecting springs on steep slopes.

Table 1. Women's domestic water collection times in the dry season in Ngendui, Nyando Basin

Woman	Quantity (litres/day)	Time (hours per load of 20 litres)	Time (hours/day collecting water)*
1	80	1	4
2	80	0.5	2
3	60	0.5	1.5
4	100	1	5
5	60	1	3
6	100	1	5
7	40	1	2
8	40	1	2
Average	70	-	3.5

Source: (Ngendui mixed group discussion, Aug 17 2004).

We turn now to the role of the government in western Kenya. In the last 15-20 years, there has been little support from government for rural water supply. "We just let them run their own schemes" says the Provincial Water Engineer (Interview, Kisumu, Aug 2 2004). In the last several years, there has been increased government interest in water questions. The Water Act of 2002 seeks to encourage private companies to provide water services. The same engineer reports this,, to be happening, with private companies forming rapidly in the urban and peri-urban areas of western Kenya. But these companies are using existing piped water supply systems, and the cost is believed beyond the reach of poor households. So far, private water companies are not reported to be investing in the development of new water systems, nor tackling issues of rural water supply.

So, assistance from government and from recently encouraged private water service providers is very limited. The main route to improved rural water supply lies through community organizations. These water associations are, however, few and of those that are started many fail.

Why water projects are not started and water associations fail

> A man at a baraza recently said: "When water is available at home, what will the women do? Go and sleep around?" (Agricultural officer, Nandi Hills August 4 2004)

Although the work involved in collecting water is long and hard, and the health effects of contaminated water severe, most rural communities in Kenya do not establish associations to improve their access to water. Of the two communities reported above, for example, some people in Kiptagan have improved their water access, but the people of Ngendui have not.

The reasons why communities do not form water associations are poorly understood, but the relations between men and women, gender relations, appear to play a significant role. Two reasons arising from gender relations emerged from this study: failure of men to value women's time devoted to water collection, and men's ideas about what women will do with their time if water is piped into the home. In addition to these concerns arising from relations between men and women, two further deterrents to water associations, and the projects they might sponsor, were described: past experience with failed collective action, and lack of land rights.

The pervasive effects on water improvements of the division of women's and men's responsibilities and perceptions were signaled in thoughtful responses from a female agricultural officer in the Nyando Basin. She was asked: "Are the [water association] committee members always men?" And she answered:

> Most women wouldn't want this job…They understand that leadership is a male-dominated field. Leading is also taxing, most women have a lot of manual work. They don't have time. But the people who feel the problem of water are the ladies. And the people who have the resources to do something about water, spring protection for example, are the men. [However] Men look only for profitable activities. They are not interested in something like spring protection…It is women's time. (Agricultural officer, Nandi Hills August 4 2004)

Two important issues are raised in this comment. First, there is the division of work and responsibility between men and women. As in many rural areas of the global south, women in the Nyando Basin do the work of water collection but the decision to devote scarce resources to water projects is understood as a male prerogative. In addition, the membership of any water association will likely be overwhelmingly male. Second, this agricultural officer draws our attention to differences in male and female perceptions of what is valuable. Women perceive water collection as an important activity, but men do not. When she says 'men look only for profitable activities. They are not interested in…spring protection…It is women's time,' this means that men value activities which bring in an income, and may not perceive the time that women devote to water collection as an outlay which the household can reduce. The low valuation of women's time, by policy makers as well as by the women's husbands, has frequently been reported elsewhere (for example Cleaver and Elson 1995). So, this finding about gender relations and water reinforces conclusions from other studies.

A second set of reasons why water associations may not be formed comes from a tantalizing brief comment, reported by the same agricultural officer. She reported that a man at a baraza [meeting?] had recently said, "when water is available at home, what will the women do? Go and sleep around?" The baraza subsequently decided not to build a water project. Of 50 people present, only two were women.

Great weight cannot be placed on a brief second hand comment and its possible connection to a community's decision not to embark upon water improvement. Nevertheless, the importance of ideas about gender and sexuality in the history of social change in the industrialized countries, and the intertwining of gender relations and access to water in most of the global south, provide an informative background to this passing comment.

Widely spread ideas about the domestic role of women, summarized in the saying 'a woman's place is in the home,' are thought to have increased male dominance of women during the industrial revolution in Northwest Europe and North America (Bradley 1996). It is possible that the expression of male fears of women's sexuality, condensed in this comment reported from western Kenya, could be a deterrent to action to improve water. If that is the case, open discussion of the question, and wide reporting of the potential positive outcomes of water projects, might help to defuse such fears.

We turn now from gender relations to indications that inadequate land rights and repeated failures of collective action may deter communities from organizing to improve water supplies and contribute to organizational failure if water associations are established.

In one community discussion, there was a consensus from the community and local government officials that lack of land tenure was a serious obstacle to improving the water supply. A group of men and women in this community was asked, "What prevents you from organizing a water project in your village?" Different community members answered as follows:

> We cannot do this because we live on government land. The land is not ours…This is a land tenure problem.
>
> …If we were given this land, even today, we would be ready to [build a water supply system]…

> Even though I cannot see, I would be ready to do this today….
>
> This would be the work of the men. The women would assist their husbands…
>
> (Ngendui group discussion, August 16 2004)

Ngendui is a community whose customary rights to land have been taken away by the declaration some decades ago that their land is part of a government forest reserve. For some time, government has been threatening to resettle this community on other land (Divisional Agricultural Officer, Tinderet, August 16 2004). As a consequence, long-term improvements to their water supply are out of the question.

Finally, in this discussion of why communities decide not to organize around water or, if they organize, their efforts do not succeed, there is the issue of the deterrent effect of past failures. The Agriculture Officer in the Nyando Basin whose comments we have previously quoted was asked, 'What leads to failure of community projects?' And she answered:

> …poor management, there is no collection of funds, no ability to pay for repairs…In some cases, spring protection may have been done without involving the community…so the community does not feel that they own it. [Some committee members expected that the government would provide money for the project]…Out of all our focal areas, about 40% of the committees are still in place.
>
> …many people become disengaged over time…Poor leadership and past experience still rings a bell in most people's minds…When people hear the term committee, they remember the road committee that failed them, they remember the cattle dip committee that failed them, they remember the health committee that failed them.
>
> (Agricultural officer, Nandi Hills August 4 2004)

So various failures of management and expectations contribute to the failure of more than half of those projects which are started. And past failures of a range of projects contributes to reluctance to embark on another community project.

How a water association and an income generation group started

We turn now from the failure of organizations and reluctance to organize around water to the question of how water associations start when those obstacles have been overcome. This section uses interviews with participants in the Chesilot Project, one of four water improvement projects in the Ketitui/ Kaptagan area of the Nyando Basin, and interviews with members of the parallel women's income generating group that has managed to translate time saved on water collection into income from agricultural produce.

We have several interlocking accounts of the formation of the project. One account is from the Assistant Chief focusing on the negotiations to secure the water source. Then two participants in a group discussion describe the impetus for a water project given to a farming group facing water scarcity, and the progression from raising funds to forming a committee. The final account, from the founding Treasurer of the project explains the importance of the founder's observation of another spring protection scheme at work. First, we hear from the Assistant Chief:

> [Organizers of a project] start with my office. They talk. Then they agree with the landowner…The owner must agree to give the water source to the community. The chief himself can come in, he can enforce this. Meanwhile they talk as people who live together. There has never been any real conflict about this. This is a communal agreement. (Assistant Chief, Ketitui/Kaptagan, August 10/04)

> Initially, a group of men came together to plant crops. Then there was a time when there was water scarcity. So this group of men decided to start a water project. (Older man, mixed group of Chesilot Project members, Aug 10 04)
>
> Once we'd raised funds and written the constitution, we realized that we needed a committee to manage the funds. The community was in a position to decide who should be committee members. (Discussion with mixed group of Chesilot Project members, Aug 10 04)
>
> In the beginning we were three. We saw a piped, gravity-flow project. We came home and decided to try it. At first we only thought we wanted to bring water near to us. We did not have farming or irrigation in mind. We had livestock in mind. The idea was very popular. More and more people were interested so we decided to form a group….In six months, we already had forty people. We had to refuse other people.
>
> When we were twenty-six, we started a full committee… officials…voting. We were meeting in the evenings and women could not meet because they have work at home.
> (Treasurer Reuben and Vice Chairman Koskei of Chesilot Water Project August 6 04)

The formal, government procedures faced by this group sound daunting: "We had to register with the Ministry of Social Services, the Ministry of Water, and the Fisheries Department. Before we started the water project, we had to consult with the Assistant Chief. And then we had to consult Social Services. We had to plan. We had to make a budget. We had to identify a site where we could draw water. We had to consult the owner of the land. Then we had to write a constitution." (Discussion with Chesilot Project members, Aug 10 04)

While there is only one woman participating in the Chesilot water project, the success of this scheme encouraged wives of the male participants to establish a parallel organization supporting women's agriculture and income generation. We shall see in the next section of this paper that this women's group appears to have generated considerable benefits.

A group of participants in the women's income generation project were asked: 'Why did you form the [women's] project?' They answered:

> One day we were sitting down over a cup of tea and decided to plan a celebration to thank our husbands for the water project. We wanted to buy them some presents. This was the first time we had sat down as women. Each woman contributed for the tea. This turned into our own group…From here, we decided to build a seed bed and grow the tea seedlings…Then we began to call for meetings every Monday…after two meetings we decided to form a committee.
>
> We had no money initially. But we wanted to earn money. The committee sat down with the members to chart the way forward. We opted for informal harvesting groups, such as tilling the land, weeding, casual labour generally…The men assisted by building the structure for the nurseries…We used money from the casual labor projects.
> (Kiptagan women-only group discussion Aug 11, 04)

The ability of the women of this community to turn time savings into money income is particularly intriguing because it provides a response to male undervaluation of women's work and to male fears that women will not use time saved from water collection in a productive manner. More information about this outcome will be provided after the next section, which discusses some of the costs of a water association.

The work and costs of running a water association

The initial costs of water improvements in Kaptagan were relatively small. The group charged a registration fee of K Sh 100. (One dollar buys K Sh 77 in 2004.) Then each member contributed K Sh 700 to cover costs of construction. In addition, the members of the project took out a loan of unknown quantity [does Wilson know?]. Thereafter, each member pays monthly fees of KSh 20 for maintenance of the water system and KSh 40 for costs of meetings.

These fees may, nevertheless, be prohibitive for a large section of the rural community. And new members, with the exception of wives joining by marriage, are being excluded: 'We don't want someone else to come in now and benefit from all we have done without having done the work.'

In the initial construction of the project, members contributed the labor moving and collecting rocks and constructing a footpath to the spring. A mason was employed to construct the concrete tank, and other monies were spent on sand, cement and pipes.

The rules and every day running of the association are described by the Treasurer:

> My job is to collect fees, every month. If [users] don't pay, I cut off their water…When pipes break down, we pay the plumber to fix them…sometimes we pay, sometimes the individual does. We also use group labour. If a person breaks something himself, then the committee does not help.
>
> We have a general meeting twice a year. At these meetings, we give the financial records to the whole group. People are reminded of the payments they owe. And they are shown how the money was spent and how much money is remaining.
> (Treasurer Reuben and Vice Chairman Koskei of Chesilot Water Project August 6 04)

This Treasurer was also asked, 'why do you think your committee has been able to manage money and maintenance issues so well?':

> All the water group members meet every week. We remind them about fees. We have been successful in collecting fees because people are really benefiting from the water. They grow crops, cash crops like tomatoes and kales. They don't want to have the water cut off.
> (Treasurer Reuben and Vice Chairman Koskei of Chesilot Water Project August 6 04)

There is a division of labor between men and women in the project. 'Women manage water within the households…[Men are responsible for] any fees or levies. Men take care of vandalism, women report the vandalism. Women also warn children not to play around taps. Plumbing is mainly the domain of men.'

In sum, a comprehensive set of rules, levies, meetings, punishments and exclusions have emerged to administer the project. As the Treasurer and Vice Chairman of the project say, above, the fees and punishments are made less onerous by the fact that the project has enabled households to increase their incomes from casual labour and the sale of agricultural produce. In the next section, we describe some of these benefits.

Productive outcomes of water improvement

Four significant outcomes are reported from community organizing around water in Kaptagan. The first is an improvement in health. The Divisional Agricultural Officer reports that typhoid has been reduced dramatically amongst participants (interview August 16 2004). The second improvement is that women have been freed from some fifteen hours per week of hard labor collecting water. The third improvement, following from this, is that they have organized to use this additional time most remuneratively in selling their labor, growing more crops, diversifying into new products and using the savings to provide credit for new enterprises. Finally, group members report that their lives are generally improved and the cohesion of the community is greater.

The connection between time saved from collecting water and the opportunity to increase agricultural production is not unique to Kaptagan. When a group of people in Ngendui were asked, 'what would women do with their time if there was more water in the home? They answered:

> After there is water in the household, the women spend their time in the shamba (farm)…There would be more time for growing crops, especially vegetables. (Ngendui group discussion)

This is how the Assistant Chief in Kaptagan describes the changes in people's lives since the water project:

> They have improved since the water project. During the dry season, they used to plant potatoes. They have started keeping livestock; they did not do this before…because of lack of water. They are also now doing horticulture. The economy has grown…
>
> The other people have now started a new water project, because of what they've seen. On a stream across, there is another new project. Kiptagan is the second. A third project started in 2001. And there is a fourth that is very recent.
> (Assistant Chief, Ketitui/Kaptagan)

Then, the women of Kiptagan describe how their lives have been changed by increased sale of produce and their formation of a revolving fund:

> Our lives have improved…. much for the better. We can undertake irrigation during the drought. We can also sell produce – we are really getting a lot from the sale of farm produce [which goes into the women's group bank account]. The women control this money [and] are at liberty to spend this money in whatever way they feel is right.
>
> Since we formed the association we have a revolving fund. Every Thursday, the women have a meeting in which members …decide to give the funds to someone. There is no standard amount that members must contribute…We keep track of how much money we collect from each person and of who we give the money to [for school fees, to buy sugar]. We can tell who is next, who has not been given to. The women's group has improved our social cohesion.
> [Kiptagan women-only group discussion Aug 11, 04]

The Treasurer of the water project notes that the project has provided most benefits to women because the men are still paying loans incurred for the construction:

> The greatest beneficiaries of this project are the women. This is because the men are still repaying the loan they took out to start the project. Once we have fully repaid the loan, then we will be able to do more activities that generate income….Agricultural production has increased generally, so family income for members is also increased. Epidemics such as typhoid have gone down.
> [Treasurer and others in mixed group of Chesilot Project members, Aug 10 04]

Broadly comparable improvements are reported from an area of rural India. where water supply has been improved and income-earning opportunities were created (James, et al 2002). The authors of that study come to conclusions that accord well with the experience of Kaptagan: 'When water supply improvements are coupled with opportunity to create income through micro-enterprises, time released from water collection is converted into income earned.'

Notes from a followup visit to Kaptagen – 2 December 2004

A group of researchers and extension workers (Ben Crow, Brent Swallow, Leah Onyango, Wilson Nindo and Daniel Bondotich) returned to Kaptagen on 2 December 2004 to follow up some of the issues emerging from Jessica's earlier interviews and lay the groundwork for additional research in the community. The community welcomed us with uncommon grace and hospitality and spoke with warmth and compassion about Jessica's brief time in their village. Here we share some of the notes from that visit.

The Treasurer and Chair of the Chesilet spring protection group provided more detail about the challenges they encountered in forming the group. The spring that they ended up tapping was their second choice. The local users of their most preferred spring blocked the development. They were fortunate to get permission from the owner of land where their second choice was located. Building the spring head box took several months and major efforts in collecting fees. A year passed by before they had raised enough money to lay the pipes to the 40 homes connected to the water system and at least another year before they raised enough funds to install a holding tank. In all, the system has required the outlay of Ksh 400,000 for materials, plus a large amount of labour. Another insight emerged regarding the reasons for the project. One of the men

acknowledged that he became interested in the water project because he wanted to expand tea production. Tea is labour intensive: by reducing the time needed to collect water, the project freed up time that his wife could then spend on the tea.

The spring protection and piped water project has not been without problems. The system has been vandalized several times, each time requiring expensive repairs. One of the vandalism events occurred just a few days before our visit.

At least two other groups without the same village have also joined together to construct spring protection boxes and piped water systems. A nearby system that has 20 members also reported difficulties in finding a spring that they could use: the women who traditionally used the most common springs were reluctant to permit any construction. They reported a similar level of cost for their water system: Ksh 200,000 for the costs of materials to cover 20 households. This group indicated interesting upstream / downstream interactions, confounded by gender relations. That is, women who live immediately upstream and around springs are the users of well established springs. Men take initiative to develop spring protection and gravity-feed irrigation system, but need to identify a spring significantly upstream from their residences to tap. Water pipes are laid across land that is controlled by men. When water is installed within a household, the women members of their households are the most obvious beneficiaries. The full distribution of benefits within the household depends, however, upon how the women reallocate their saved time.

Intriguing directions for future research

What are the circumstances that lead to spontaneous organizing to improve access to water? Under what conditions does the time saved by women in water collection translate into income generating activities? Answers to these important questions given by rural communities and government officials in western Kenya involve a wide range of variables including:

1. The natural conditions of the area, particularly the location and characteristics of water sources
2. Economic circumstances, such as access to markets and demand for the products which can be produced by the community
3. The history of community organizing, land and water rights, and the availability of basic organizing skills
4. The ability of men and women to negotiate the constraints and opportunities of gendered roles in the community.

This wide range of social and natural variables emphasizes the need for greater understanding of the complex social circumstances in which new technologies are adopted. Many communities in western Kenya have now learned about new technologies of rainwater harvesting and spring protection. Few have been able to adopt them.

The two most intriguing directions suggested by these communities concern the reasons why associations are not started and the circumstances under which women's organizing may emerge. Effective water associations are believed to be few. The reasons for this are poorly-understood, but they may include past experience with failed collective action, failure of men to value women's time devoted to water collection, men's perception that water improvement is a costly activity not generating income, and men's ideas about what women will do with their time.

In a few cases, improved water access is being generated through spontaneous social action. Then, the combination of a (male-dominated) water project and (female-organized) income generation manages to bridge the divide of male and female responsibilities and redress the low valuation of women's time by men. This research is focused on cases of successful rainwater harvesting in Lare District and spring protection in one part of the Nyando river basin. The successful emergence of water user associations in these two areas is associated with some promising economic and social changes.

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Traditional Water Governance and South Africa's "National Water Act" – Tension or Cooperation?

Daniel Malzbender, Jaqui Goldin, Anthony Turton & Anton Earle

In its first part this paper discusses the rationale for the recognition of traditional water management structures in the light of the realities of water management and supply in South Africa's rural areas. Based on the findings of two case studies it is argued that customary arrangements form part of the social adaptive capacity of communities and can aid integrated water resource management. In the second part, the relationship between traditional water governance structures and South Africa's new National Water Act is explored and the case is made that South Africa's law and policy framework supports the recognition of traditional water governance structures as part of the overall water management strategy. Based on these arguments, in its final part, the paper debates the role for traditional leadership in water management in the cross-over zone between traditional rural customs and the new democratic governance and service delivery structures in South Africa.

Key words: traditional water management structures, public participation, legal pluralism, social adaptive capacity, service delivery, national water law and policy

Introduction

> Flexibility to address different situations is a key requirement for successful management. However, the limits of self-regulation should be recognised. Water is too valuable a commodity for its management to be handed over to its users and there remains a vital role for external monitoring and enforcement.
>
> White Paper on a National Water Policy for South Africa (DWAF,1997)

The above statement portrays the complex trajectory that is part of South Africa's water law and policy reforms in recent years. The new water governance vision is in line with the country's development approach in this and other sectors and, aims at promoting widespread stakeholder participation in water management. However, strong emphasis is placed on formalised[1] water governance structures with a strong state maintaining centralised control over the management of water. Whilst participatory governance and formalised government structures based on statutory law do not necessarily contradict each other, in many rural areas formalised water management institutions do not promote widespread stakeholder participation and in some instances contradict the central premise of widespread stakeholder participation by excluding the rural poor. The problem in these areas is that weak government structures are not replaced by alternative forms of water tenure and consequent mismanagement of the resource can have negative consequences for sustainable resource management. In some regions of South Africa, customary[2] water management structures that operate outside the framework of statutory law are able to fill the void caused by inefficient government structures.

Despite the government's vision for a comprehensive formalised system of water governance, water management in South Africa, and in particular in rural South Africa, tends towards plural legal systems. But, this feature of plurality is itself precarious as rapidly changing patterns of social behaviour and the intervention of modern structures lead, in some cases, to the erosion of traditional values and traditional knowledge systems. This paper argues that customary water management structures do play an important role in the overall water management framework in South Africa and that these structures can provide a vehicle to ensure sustainable water resource management at grass-roots level. The paper explores the relationship between the different legal systems and examines synergies between the statutory and traditional systems of water management that further the objectives of integrated water resource management.

Customary water management structures as part of the social adaptive capacity of communities

The majority of South Africa's rural poor continue today to live in former homeland areas that were recognised by the Apartheid regime as independent governing states. The provision of services and infrastructure, advantages of the strong centralised regime, did not benefit residents of the 'homelands' or 'independent states' and traditional authorities, whose rule was based on customary law, played a strong governance role in these areas of the country. Post 1994 these homeland areas were re-integrated into post apartheid South Africa. Today, in accordance with Section 40 of the South African Constitution (Act 108 of 1996), government functions are exercised by the three government spheres, national, provincial and local government. Under the statutory laws of the country, the rationale for recognising and revitalising customary law as part of the overall water management framework, remains questionable. The ability of the state to effectively manage and control water resources by the state remains problematic. According to Schreiner et al (2002), millions of South Africans are still dependent on water from open streams, boreholes or stagnant sources. In particular, water delivery to the former homelands as the poorest areas of the country remains inadequate. Despite strong government efforts to improve water supply to the rural poor and to implement a comprehensive formal water management and supply system as stipulated by the National Water Act (36 of 1998) (hereafter NWA) and the Water Services Act (1997), the inability of the state to provide adequate water and sanitation to all South African in the near future, is cause for concern. Certainly, evidence suggests that the fledgling democracy faces very real institutional and financial constraints that challenge its ability to achieve integrated water resource management. In the light of these problems with formal water management systems, traditional or customary forms of water management might well provide an attractive and practical alternative.

The importance of traditional or customary responses to inadequate water supply is highly relevant to the concept of social adaptive capacity. Social adaptive capacity is the ability of a society to adapt its patterns of (water) resource use to increasingly scarce supplies and achieve a sustainable measure of social stability (Turton & Ohlsson, 1999; Ashton & Haasbroek 2002). A detailed analysis of the concept of social adaptive capacity is beyond the scope of this paper, but, in brief, social adaptive capacity is the development of second-order resources in response to first-order resource (water) scarcity. Turton & Ohlsson (1999) define second-order resources as a set of potential adaptive behaviours and strategies. This paper proposes that customary and traditional management structures are an integral part of the second-order response by a specific community to the form and level of water scarcity experienced by its members. Within this context, the implementation of effective water demand management strategies manifests effective social adaptive capacity (Turton, 2002).

The following case study, based on the findings of a short field trip to some regions of the Limpopo Province, presents the example of an effective water demand strategy operational under customary law. Legal pluralism is a response to inadequate new institutions that are not yet able to replace traditional and customary ways of coping with water scarcity. Until such a time that 'modern' institutional structures become viable mechanisms with which to respond to water scarcity, customary law performs a much needed governance structure that is able to respond effectively to water scarcity.

Case examples: Tshikombani village and rural villages in Tzaneen Municipality

Residents in the small rural village of Tshikombani in the former homeland of Venda are supposedly beneficiaries of government water supplies, but government water supplies remain inadequate. Tshikombani is in close vicinity to a pristine mountain stream that provides its residents with a secure supply of clean water. Although the younger and more educated people in the village believe that it is the responsibility of the government to deliver clean water to all citizens, the villagers have installed a self-financed and self-regulated water supply system that is managed by the local traditional leader. This system ensures a regular supply of water to the village. The reticulation system that has been constructed by the villagers is an intriguing system of hose pipes that divert water from the mountain stream into the village gardens and that supply water to the dwellings. Because the stream flows above the village, water is transported by means of gravity and no pump is required.

Maintenance and decision-making

The construction and maintenance of the system has always been financed by the villagers themselves and funds were collected from each household in Tshikombani by the traditional leader, if and where residents were both willing and able to contribute. The funds that were collected were used to purchase the raw materials necessary to maintain the system in working order. The traditional leader is the person responsible for operating and managing this water system. Decision-making around operational issues that might arise or how the collective funds will be spent, is shared by the community members who have made financial contributions to the water reticulation system. Interestingly, many of those who are part of this decision-making body no longer reside in the village but nonetheless continue to contribute financially to the maintenance of the water system. In fact, a substantial part of the funds are provided by villagers who are working outside the village because jobs opportunities in Tshikombani are few and far between. As is to be expected, this arrangement does have severe logistical constraints. Decision-making, in particular when there are urgent decisions that need to be made concerning repairs to the water system that occur because of bursting pipes and so forth, is therefore invested in the traditional leader. For instance, when there is a burst pipe, the traditional leader appoints villagers to make the necessary repairs. Remuneration for these repair jobs comes from the communal fund which is administered and accounted for by the traditional leader.

Weak state versus strong traditional leadership

The traditional leader's authority over water issues is extensive and includes conflict resolution in water matters and the allocation, management and control of water resources in the area. In the case of Tshikombani the role of the traditional leaders is to settle disputes not only amongst villagers but also between villages. An example of intra village conflict arose when an adjacent village, claimed equal access to water from a shared stream and argued that because the source was shared they too should be beneficiaries of the water scheme. Residents from Tshikombani rejected the claim and the traditional authorities from the two villages were unable to resolve the water dispute. As a result, the case was referred to the local Magistrates court, which was also unable to reach a resolution, arguing that the problem should be resolved by local leaders and insisting that the onus was on the traditional leaders to resolve any disputes that might arise concerning the allocation of water. In this particular case, the traditional leaders did find an amicable solution – ruling that the adjacent village could qualify as equal beneficiaries of the resource on condition that they contribute equally to the finances required to maintain the water scheme.

Interestingly, the younger members in the village were more hostile towards the neighbouring claimants than their older counterparts and in fact, reportedly, there were even incidences of violence. In the absence of an "official" political solution, and because, the state court declined to take judgment, traditional leaders had to step in and they deployed traditional mechanisms of conflict resolution. However, this case raises concerns because, in the absence of strong traditional leadership and in the absence of either the ability or the desire to resolve conflict over shared water a dispute of this nature could well escalate into animosity.

Weak state and weak traditional leadership

In the villages that fall under the jurisdiction of the Tzaneen Municipality, there are no customary water management systems in place. The town of Tzaneen (approximately 100 000 inhabitants) is the commercial centre for the surrounding farming communities and services numerous rural villages. Most villages that fall within the Tzaneen Municipality are connected to the municipal water supply. But the water provided by the municipality is for household consumption and the water consumption needs of small-scale agriculture and livestock are not yet met. Because there is no effective alternative solution of water supply for non domestic consumption, consumers vandalise municipal pipelines and divert water for the purpose of irrigation systems, using a make do hose pipe system. The hose pipes tend to be loosely connected to municipal pipelines and can be easily disconnected by stray livestock. Water that is not lost is used for the irrigation of home vegetable gardens and as drinking water for domestic animals, however large volumes of water leak undetected for days on end. According to municipal sources, ad hoc illegal connections result in large volumes of unaccounted water, as high as 50%-70% in some areas. The financial consequences of illegal water connections of this nature weigh heavily on the coffers of the local municipality because water, purified at considerable costs to the tax payer, is wasted.

The consequences of non government intervention in service delivery

In both Tshikombani and Tzaneen government's management and control of water is lacking but in each case, the problems that face government differ considerably. The villages under the Tzaneen Municipality respond

to inadequate first-order resource supply through illegal connections that result in loss of revenue and misuse of the municipalities scarce first order water resource. In Tshikombani, water consumers deal with non response from the state by accessing themselves the first order resource directly from source. The absence of state supply of water to villagers has resulted in remarkable adaptive capacity at a grassroots level and a customary water management system is fully functional. But it is unclear exactly how the traditional response articulates with the statutory institutional framework provided for by the NWA of 1998 and the relationship between the two systems requires more clarity. The following section of this paper provides a broad outline of the legal water resource management framework provided for by the Act and highlights ways in which the formal statutory framework articulates, or fails to, with customary structures.

Discussion: the legal relationship between South Africa's new water law and traditional water governance structures

The management of the country's water resources and the ongoing transformation of the South African state and civil state has found its most profound expression in the National Water Act that was promulgated in 1998. The NWA manifests a fundamental step in the evolution of South African water law. Historically, under the rule of the Dutch East India Company between 1652 and 1795, water use was governed by Roman Dutch Law and the Dutch East India Company assumed *dominus fluminis* (the overall right of control) over the water resources. Individuals held temporary and revocable rights to water only where such rights did not undermine company access to water (Tewari, 2001). After 1795, under British rule, water rights were linked to land tenure. Private (riparian) water rights had precedence over public water rights (Tewari, 2001). After the formation of the Union of South Africa in 1910, the Union Irrigation and Conservation of Water Act No. 8 of 1912 was promulgated. This law did not provide for any government control over public water resources. The allocation of water between riparian owners was the responsibility of Water Courts (Turton et. al., 2004). The Water Act (54 of 1956) upheld the distinction between "public water" and "private water" (Stein 1999, Stein 2002) and the latter category was determined by the riparian principle.

Under the NWA the distinction between private and public water has been removed, a consequence of the fundamental shift in resource ownership where water is considered as a resource common to all. The NWA mandates the State, acting through the Minister, as the trustee of the nation's water resources. The concept of water as a public good is not new and had long been established as a legal principle in various societies and legal systems, ranging from Roman law to African customary law. Today this is an internationally accepted concept (Stein, 1999). South Africa's shift from a private rights system to a public rights system is in line with the values of the new Constitution. Section 27(1) (b) of the Constitution guarantees every South African the right to access to sufficient water and Section 24 stipulates that everyone has the right "to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (Section 24 (b)) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development" (Section 24 (c) iii). In Section 7 (2) of the Constitution the obligation is conferred on the state to "respect, protect, promote and fulfil the rights in the Bill of Rights" (of which Sections 24 and 27 are a part of). In other words, Section 7 (2) of the Constitution forms a progression, from the "traditional" application of the rights enshrined in the Bill of Rights as a protection of the freedom of individuals from interference by the state (and to some extent other individuals), towards an obligation for the State to proactively create conditions that ensure the realisation of these rights for all. Within this context Section 3 (1) of the NWA stipulates that the government "must ensure that water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all persons and in accordance with its constitutional mandate".

The catchment management approach

The values inherent in the Constitution, the NWA, the 1997 White Paper on a National Water Policy for South Africa (hereafter the Water Policy White Paper) as well as the National Water Resource Strategy, established in terms of Section (5) NWA, form the backdrop to water management in South Africa and the new law and policy framework promotes Integrated Water Resource Management (Ashton, 1999). In line with international theory, that naturally occurring water can only be effectively and efficiently managed within a river basin or catchment area, the principle that water management is at a catchment (or regional) level, is at the core of the new water management approach. The NWA provides for the establishment of Catchment Management Agencies (CMAs) in 19 delineated Water Management Areas (WMAs)[3]. Each

agency must draw up a management strategy for the catchment and will have to perform core functions to implement the Act, functions that include the active promotion of community participation (Hamann & O'Riordan, 2000).

The Catchment Management Agencies - a platform for customary water management?

In what ways will customary water management structures articulate with CMAs in the future? Has this interaction been provided for by the NWA? The NWA does not explicitly recognise customary water management structures and in fact, customary water management structures are not mentioned at all in the NWA. Any possible recognition of traditional arrangements can only result from interpreting the NWA and the water policies that offer practical guidelines for the implementation of the catchment management strategy within the legal framework of the NWA. Customary water management structures have a role to play in both water resource management and water service delivery. In other words, these structures can be used to interlock with both water services (at the municipal level) and enhance water service delivery and water resource management (at the catchment level) and enhance integrated water resource management.

Public participation is one of the principles that is designed to ensure efficient and effective catchment management, a vague enough concept but one that does make provision for the involvement of a wide range of stakeholders in decision-making processes. Principle 23 of the Water Policy White Paper states that the "responsibility for the development, apportionment and management of available water resources shall, where possible and appropriate, be delegated to a catchment or regional level *in such a manner as to enable interested parties to participate*" (italics added). Although this principle recognises public participation, it leaves a number of questions unanswered. Firstly, interestingly the Act makes allowances by noting that the principle should be implemented "where possible and appropriate" giving latitude for discretion as to whether and how public participation is implemented in practice. Principle 23 also speaks of enabling "interested parties" to participate in decision-making, but how such interest is defined remains vague. It is unclear whether and in what ways the state (represented by the statutory CMAs) would be expected to bring aboard stakeholders that are unable to participate. Neither is there any definition of how that process of participation will happen and practical mechanisms for a process of integration are absent. Disconcertedly, notions of participation remain vague.

Despite this vagueness, the NWA clearly recognises that stakeholder participation is a prerequisite in the CMA process. In Section 80 (e) of the NWA it is stipulated that one of the functions of a CMA is "to promote community participation in the protection, use, development, conservation, management and control of the water resources…". Section 81 (1) of the NWA notes that the governing board of a CMA must be appointed "with the object of achieving a balance among the interests of water users, potential water users, local and provincial government and environmental interest groups". Additional members may be appointed to "achieve representation of disadvantaged persons or communities which have been prejudiced by past racial and gender discrimination in relation to access to water;…" (Section 81 (10) (e)). Some substance has been added to these principles by the guidelines of the national policy for the implementation of catchment management (DWAF, 2001) and, in these guidelines, the principle of local participation by stakeholders has been emphasised where it is stated that "representivity and inclusivity of all stakeholder interests, needs and values are considered as part of the catchment management process, particularly of marginalised communities such as women and the rural poor".

Over and above policy rhetoric, the DWAF in Limpopo has embarked on a mission to identify the widest possible range of stakeholders for participation in the CMA process. DWAF officials consult with a wide range of stakeholders in the region in an endeavour to ensure that not only the formally recognised institutionalised bodies such as irrigation boards, but importantly, the more loosely associated rural communities, participate in governance structures to ensure integrated water management.

Recognition through formation of WUAs?

Whilst these steps are encouraging, consultation of rural communities does not in itself mean the recognition of traditional water management structures which could be integrated into the water management structures through the formation of Water User Associations (WUAs), statutory bodies, defined by the NWA as co-operative associations of individual water users who wish to undertake water-related activities for their mutual benefit. At the time of designing the NWA, it is likely that these bodies were considered as a way to include farmer associations or irrigation boards but WUA could well be used to incorporated customary

water supply and management system, such as those operational in Tshikombani. One problematic is that the establishment of a WUA is subject to highly formalised procedures and that these procedures are not in fact compatible to traditional systems whose modus operandi is more fluid. In fact, the very success of the traditional systems is that they remain flexible and responsive, allowing for cost-effective dispute resolution. Furthermore, the establishment and management of WUAs is highly bureaucratic and costly and for many rural communities, the financial and institutional capacity to run a WUA does not present a viable solution. Effectively then, WUAs are not the solution and would be unable to provide the suitable vehicle for the integration of customary arrangements into the overall water management framework. How then could customary law and 'modern' legal systems best be integrated into the formal water management systems?

Three arguments for the recognition of traditional water tenure structures in their existing form

In closely examining the guiding principles of the national implementation policy, there does seem to be a place for traditional structures to play a role in catchment management. The purpose of the policy is to provide clarity on the "responsibilities and functioning of the statutory water management institutions…, as well as their relationship with other statutory *and non-statutory institutions"* (italics added). The reference to the relationship between statutory and non-statutory institutions indicates that the national policy guidelines do take non-statutory institutions into consideration, providing thus for customary water management systems to form part of the overall catchment management strategy. This is confirmed when looking at three further objectives that are stated in both the implementation policy and the White Paper on Traditional Leadership and Governance (DPLG, 2003).

Argument One - Considering community values

In reporting their findings on research on a project that aimed at promoting stakeholder participation in water management, van Wilgen et al. (2003) note that new means of dealing with water needs must incorporate the values of people on the ground, a principle recognised in the implementation policy for catchment management. What appears in the guidelines of the implementation policy is that the interests, needs and values of all stakeholder groups must be considered in the catchment management process. Whilst there is the rhetoric within the institutional framework provided for by the NWA that provides for these interests and needs of local water users, the actual inclusion of ordinary water users and integration of their value systems and local knowledge of water matters, remains questionable. The norms and values of any particular community are manifest in the rules that govern that community and traditional water governance structures are themselves a manifestation of the intrinsic value system that binds the community. Reciprocal norms and values, the networks and relationships of people within a community, also referred to as the social capital of a community, guide and inform the way in which critical resources are consumed, managed, protected, conserved and used. The scope of this paper does not allow for a detailed investigation into the norms and values of the Tshikombani villagers but it is apparent that there is a well ordered and well tested local knowledge regime that operates. Local responses to scarcity in water show high levels of cooperation and well ordered social activity to maintain and preserve the resource. However, the responses of local villages have not been documented and they have not been recognized as part of a formal water management system in the Limpopo catchment. Despite emphasis in the law that local norms and values should be part of integrated water resource management, these norms and values have not been formally recognised. Social adaptivity is apparent but this principle needs to be more carefully documented and reconciled with the guiding principles of the NWA.

Argument Two - The principle of subsidiarity and self-regulation

The case for the recognition of traditional water tenure structures can be strengthened by taking a closer look at the principle of "subsidiarity and self-regulation" that "requires the DWAF to promote the devolution of responsibilities to the lowest level consistent with effective functioning of the system". The principle does not state that the lowest level is limited to DWAF-internal structures or any other structure provided for in the NWA, such as the CMAs or WUAs. The lowest level could well be the village level where water management is based on a customary system, provided that this system is effective and is in line with the principles of integrated water resource management. In the case of Tshikombani, water provision in the village is indeed based on an effective and well functioning customary system. Tshikombani village, in juxtaposition to the villages in the Tzaneen Municipality, where there are no customary water tenure structures in place, makes it clear that a customary system can not only be consistent with the overall management system, but that such a system can provide major benefits to water resource management in the catchment.

An examination of yet another aspect of the Tshikombani case study drives this important point home. A high ranking DWAF employee operating from the regional office in Polokwane and responsible for water resource management in that region acknowledged the tension between his responsibilities as a regional resource manager at DWAF and his experiences as a local inhabitant of the village. The tensions between modernity - with its manifestation in the promulgation of the NWA - and traditional norms and values that sit more or less comfortably alongside one another, are evident. As a DWAF official, allegiances are to carry out the principles outlined in the NWA but there are also local norms and values that form part of the officials 'social capital' and that are not explicit in the Act. In other words, the public and private sphere are not easily reconciled and there is some irony that a DWAF official, adhering to local rule and norms, contributes to a customary water management system because the State has not provided for the consumption needs of local residents. The fact that there is an informal system of exchange without which consumers would not benefit from adequate water, is not formally acknowledged by DWAF and there is some irony in the fact that a DWAF official himself makes such contributions. With the failure of the state to effectively supply water to local residents, private and informal systems of exchange (money) ensure the supply of water.

DWAF (responsible for water resource management) and local government (responsible for household water provision) are able to fulfill their mandate in some areas but there are a number of areas, such as Venda, where the reliable delivery of water is unlikely to be achieved in the near future. Auerbach (1997) is of the opinion that there will always be a limited capacity in DWAF because of the magnitude of the problem of managing water throughout the country. It is unlikely that DWAF and local municipalities will be able to control abstractions, for instance, and according to the Limpopo regional DWAF official, it would be a great benefit to DWAF to recognize the capacity of local residents to manage and supply water as is the case in Tshikombani and that such examples of social adaptivity would be of great benefit to integrated water resource management in a given area. According to Turton (2002) the recognition of local water regimes offers a solution to scarcity of second level resources and provides a bridge between traditional and state institutions. In this way, traditional systems become 'legitimate' organs of water supply and management and become part of the solution to protect, use, conserve, manage and supply water.

Argument three - The national policy on traditional leadership

There is another argument derived from the White Paper on Traditional Leadership and Governance (DPLG, 2003), the official national policy on the role of traditional leaders, that favours traditional water tenure structures. The White Paper requires national and provincial government to provide for the involvement of traditional leaders (through legislation and other means). This White Paper makes provision for traditional leadership to promote sustainable water resource management. The Traditional Leadership White Paper was adopted in 2003, five years after the promulgation of the NWA, and indicates that the promotion of sustainable traditional approaches to water resource management by traditional leaders has been seen by policy makers as being within the legal framework of the NWA. The adoption of this White Paper makes a strong case for integrating these 'alternative' systems into existing legal frameworks as proclaimed by the NWA.

Traditional dispute settlement versus Water Tribunals

Despite these arguments, there is concern that the integration of customary water management structures into the existing legal framework makes allowance for the settlement of local water related disputes in traditional courts. The current reality in rural South Africa is that the administration of justice is predominantly carried out by chief's courts (South African Law Commission, 2003). The Law Commission report on the judicial functions of traditional leaders, which forms the basis for the upcoming Act regulating the matter, indicates that this practice will continue to be officially recognised by law and that customary courts are to be given the status of courts of law (South African Law Commission, 2003).

The example of Tshikombani village shows that traditional means of dispute settlement can be very effective with regard to disputes over water and, in the Tshikombani case; this was also recognised by the local Magistrates court. The recognition of traditional water governance structures requires, for it to be fully effective, the acceptance that water disputes would be settled through traditional leaders. However, traditional means of settling disputes over water could conflict with the Water Tribunals that are established by Section 146 of the NWA. The Water Tribunals have been established to hear appeals against decisions

made by a responsible authority, catchment management agency or water management institution as defined by the Act. If it is argued, as it is done on this paper, that customary arrangements should be recognised by the NWA, customary arrangements could fall under a, then wider, definition of "institution under the Act". Even if this wider definition would be recognised, the jurisdiction of traditional courts and the Water Tribunals does not overlap. Section 148 of the Act lists the decisions against which an appeal can be lodged. Water usage, as regulated by customary norms, would typically be recognised as a Schedule I usage, which is water for domestic use, small gardening not for commercial purposes and the watering of animals - if not excessive in relation to the capacity of the water resource - or alternatively usage under a general authorisation in terms of Section 39 of the NWA. As these uses do not require a license and as they are not subject to cost recovery, Section 148 does not provide for the eventuality of bringing disputes over these small-scale water uses before a Water Tribunal. This is important for it means that traditional water governance structures are not in any conflict with the means of adjudication provided for in the NWA.

The case for recognition confirmed

Although the NWA itself does not make explicit the recognition of traditional and customary systems of water management, there is sufficient backing from the Constitution itself, the Implementation Policy for catchment management and the White Paper on Traditional Leadership, to make a strong case that traditional systems be recognised as viable and valid water management structures. Integrating traditional and 'modern' systems of water supply fills a gap – the lack of capacity and inability of the state to fulfil its mandate of water delivery to all citizens – particularly to those in isolated rural areas of the country. At the same time it offers an opportunity for local consumers to enter into dialogue with public officials who have technical expertise. The articulation of the traditional and the 'modern' enhances second level resource and promotes social adaptivity.

The role of traditional leadership in the cross-over zone between rural customs and the new democratic system

As has been outlined above, the NWA makes provision for broad based stakeholder participation. The integration of traditional water management systems provides an opportunity space for this 'ideal' to be realised in practice. At the same time, it is critical that traditional leadership does not usurp other forms of community participation that exist already or that might exist in the future and this critical inquiry into the role of traditional leaders is an ongoing and important project. The following section provides a brief overview of the extent and nature of traditional leadership in South Africa.

The institution of traditional leadership in the constitutional context

To date, approximately 18 million people in South Africa (about 40 % of the population) are subject to traditional rule exercised by approximately 800 chiefs and 13 000 headmen (Bennett 2004). Against the background of these figures it comes as no surprise that the matter of traditional leadership is dealt with in the Constitution as the highest law of the land. Provisions that deal with traditional leadership can be found in Chapter 12 of the South African Constitution and Section 211 of the Constitution explicitly recognises the institution, status and role of traditional leadership according to customary law (subject to the Constitution). Section 211 (2) of the Constitution stipulates that a traditional authority that observes a system of customary law may function "subject to any applicable legislation and customs, which includes amendments to, or repeal of, that legislation or those customs". Whilst recognising the institution of traditional leadership and the plurality of legal systems, this principle effectively establishes the superiority of statutory law over customary law. In other words, customary law is tolerated only when it does not contradict statutory law. Furthermore, in terms of Section 211 (2) of the Constitution, the legislature is entitled to repeal existing customary law, amend it or replace it by statutory legislation. Experience in other areas of law indicates that legislatures tend to make extensive use of such "inroad-provisions". It can be expected therefore that ongoing legislative activity will, over time, restrict and inhibit customary law and will curtail the influence of traditional leaders in the process. Thus, whilst there is no doubt that traditional leadership as an institution is protected by the South African Constitution, the degree to which traditional leadership will play a role in the overall governance system in the future might be subject to change.

The legitimacy question

The constitutional recognition and protection of the institution of traditional leadership, does not address the question of the legitimacy of individual traditional leaders. Traditional arrangements only aid the overall management of the resource if they are handled efficiently and effectively on a sustainable basis. As they are not based on written policy and in the absence of a governing board with powers to elect or replace managers, customary arrangements rely heavily on the individual vision for water and management of the resource by a traditional and legitimised leader. Because the legitimacy of a traditional leader is crucial for the endorsement of decisions that are taken by such a leader, there might at times be a problem in placing a traditional leader at the helm of water management structures. Despite concerns in ensuring legitimacy of traditional leaders, Turton (2002) suggests that traditional institutions tend to have greater legitimacy than government structures in some developing countries in Africa.

A multitude of critical arguments are frequently cited to dispute the legitimacy of traditional leadership for various reasons but in many areas traditional leaders continue to enjoy a high level of support from the local population and are still an important governance factor at the local level. Any assessment as to whether and what role traditional leadership could play in water management needs to be considered against the background of this reality.

Historical allegiances

The legitimacy of traditional leadership is controversial because of the historical allegiances of traditional leaders under the apartheid regime. Traditional leaders, which until then were perceived to be legitimate rulers by the local population, have collaborated with the former Apartheid government and formed the core of the "independent" homeland governments, collaborating with the structures and programmes of the Apartheid state. Many "legitimate" traditional leaders that rejected collaboration with the old South African government were replaced with less critical leaders, who, in turn, were not perceived to be legitimate leaders by the majority of the people they ruled. As a legacy of the apartheid regime, traditional leadership in some areas suffer a severe lack of trust, which impacts negatively on their perceived legitimacy. As a result of the replacement of traditional leaders by the Apartheid government many rural areas are now experiencing succession disputes between the families of the incumbent 'legitimate' traditional leader and the families of the leaders that were given authority by the former government. The ongoing succession debate in some areas undermines the reputation of traditional leadership as a whole and has in some instances lead to the erosion in support for traditional leaders, weakening their position in the governance framework in the process.

Constitutional arguments

One argument that is presented concerning traditional leaders is that the current nature of traditional leadership violates the constitutional principle of separation of powers. Traditional leaders perform executive, judicative and sometimes also legislative functions and the rule of traditional leaders is not subject to the doctrine of separation of powers, upon which the modern democratic state depends. The institution of traditional leadership is protected by the Constitution despite the absence of the separation of powers. The fusion of powers is seen as a core component of the traditional African system of governance and is therefore protected within the institution of traditional leadership itself. Wherever it is seen as being a problem for the functioning of the democratic state and its institutions, Section 211 (2) of the Constitution can be invoked and the question addressed through statutory legislation.

Based on the Constitution there are two further arguments against a prominent role for traditional leadership in South Africa's governance framework: the hereditary nature of traditional leadership and the inherent discrimination of women.

Ntsebeza (2002) argues that in so far as traditional leadership is based on hereditary rule, the possibility of rural residents having the freedom to choose which institution and individuals should rule them is automatically excluded, making traditional leadership irreconcilable with the values of the South African Constitution. Whilst this argument cannot easily be dismissed, it needs to be considered in the light of governance reality in rural areas. Oomen (2002) has established during her intensive field work that the people in rural areas feel a strong need for some form of governance to maintain order and ensure peaceful co-existence, a need often expressed in the phrase "no herd of cattle can look after itself". The weakness of elected government institutions often

means a failure of these institutions to deliver even the most basic service and despite arguments against the hereditary nature of traditional leadership; people will look for a solution in the traditional form of governance. In the light of constitutional values, this purely practical argument is supported by the fact, as Ntsebeza (2002) concedes, that traditional rule can be democratic in one important respect, the involvement of rural residents in decision-making processes. In other words, in the field of public participation, itself a constitutional value, traditional rule might well be ahead of elected, formal government structures. Ultimately, the continuous acceptance of traditional leadership, and this despite its hereditary nature, will depend on the real availability of governance alternatives. As long as elected structures are not perceived by rural people to present an alternative, the legitimacy of traditional leadership should not be disputed on an abstract constitutional notion, because traditional rule has, itself, the potential for incorporating constitutional values.

The second argument noted above, is the inherent bias of traditional rule against women (Lahiff, 1997). A gender bias is not tolerated for in the South African Constitution but, despite the seriousness of such a bias, the marginalisation of women in decision-making processes is not a feature unique to traditional leadership. It is a characteristic of a wide range of institutions where women often play a subordinate role and do not participate in decision-making on an equal level. Hemson's (2002) research shows that this is the case in other, non-traditional water management structures in South Africa. The problem of gender inequality is not addressed by disputing the role of traditional leadership on the ground that it marginalises women. Efforts to promote gender equality need to be made in all areas of society, including traditional leadership. Suggestions have been made, and to some extent implemented, that enhance women participation in traditional structures. The future will show whether and to what extent traditional leadership has succeeded in achieving gender equality.

Erosion of traditional values

The role of traditional leadership in the governance framework might be threatened by movements that are taking place in society due to globalisation processes and trends of modernity that contribute to the overall erosion of traditional values. Whilst this is a much researched phenomenon an in-depth discussion is well beyond the scope of this paper, but suffice to say, particularly among the younger generation and the more educated factions of society, traditional values are increasingly disregarded and the role of traditional leadership is being seriously challenged. Another short case example from the Tzaneen area, the example of the Rain Queen Modjadji, serves to illustrate some of the complexities of traditional leadership. Modjadji was historically recognised as queen over the area between the Great and Little Letaba and the Molototsi Rivers. After the demarcation of territorial boundaries by Paul Kruger's government in 1892 her kingdom shrunk to 179 square kilometres, limited to the Duiwelskloof area near Tzaneen. Even today, the supremacy of Queen Modjadji is acknowledged by chiefs far beyond the small area where she rules. As the name suggests the Queen Modjadji is associated with rain-making and is viewed as the most powerful rainmaker in Southern Africa (Krige & Krige, 1943). Her rainmaking powers, whose exact details even today remain a mystery to the wider public, are exercised through a complicated and intriguing system of interaction between Modjadji and her ancestors. Her subordinates pay their respect to the queen in an annual pole dance ceremony, in which each village under her rule symbolically contributes to the maintenance of the royal kraal by delivering a new pole for repairs on the kraal. This ritual was traditionally accompanied by a monetary contribution that ensured the ongoing survival of the monarchy. Today, the tradition is disappearing as most villages have stopped making monetary contributions, and argue that the queen, like all traditional leaders, receives a State salary. The queen herself, as tradition has it, is not supposed to be seen during the entire time of her rule but the current, new and very young queen, is breaking away from tradition, as one interviewee put it with some expression of disapproval, "by attending the sale at Woolworth where she bumps into her commons".

The increasing acceptance of and reliance on elected governance structures by the younger and more educated factions of society exacerbates the erosion of support for traditional leadership. As is the case in the villages that are under the jurisdiction of the Tzaneen municipality, there is a vacuum in governance and this vacuum has an adverse effect on the management of water resources. There are exceptions, such as the Tshikombani case presented in this paper, where traditional leadership enjoys strong support and plays an important role in the overall governance systems.

The paper indicates the complex set of changing realities and makes it difficult to access exactly what role traditional leadership can play in governance as a whole and in contributing to integrated water resource

management in particular. On a case to case basis, where, traditional governance models are able to play an efficient and effective role, the paper has argued that there is place in the South African water law and policy framework for their recognition and incorporation in integrated water resource management.

Conclusion and way forward

Both statutory and traditional governance structures are unstable during this time of deep change in the country and South Africa is, as Derman (2000) notes in the midst of 'massive social, economic and environmental change' that according to the author form a 'mixed balance sheet between difficulties and opportunities (ibid). The paper has argued that traditional leaders have an important role to play in narrowing the gap between policy and its practice and that there is sufficient evidence on the ground to suggest integrating traditional systems of control and management of water into formal structures that are provided for by the NWA. The paper has presented a coherent case that the legislation provides an opportunity for traditional systems to operate comfortably alongside the newly created statutory systems, such as the CMA and the WUAs that have been ordained in the NWA and to play a significant role in creating sustainable and effective solutions for integrated water resource management. At the same time, well functioning traditional structures could ensure effective and efficient water services and contribute to water service delivery. The paper has presented an argument showing that existing water policy does not have to be changed and that legislature makes provision for traditional leaders to play a role in integrated water resource management. The way in which 'informal' systems fit into 'formal' statutory bodies, such as the WUA needs to be designed on a case-to-case basis and one size does not fit all. In some areas, such as Tshikombani, organised water management systems are already in place and these systems address scarcity of first order resources and show remarkable evidence of social adaptivity. In other cases, there are no such systems in place and DWAF officials need to step in and fill the gap where local knowledge systems fail to respond to water scarcity. There are constraints that exist in integrating traditional systems with existing statutory laws: the inability of government officials to understand the informal 'hidden' norms and values that operate under customary structures, the tensions that exist between youth and older members with the well recognized 'clash of cultures' that occur as old meets new, the lack of monitoring and evaluation devices to ensure inclusivity and equal access of all members to public goods such as water, challenges in empowering women and enhancing gender equality and so forth. Many of the existing problems that face traditional authorities are not particular to systems of traditional rule but are general problems that are part of shifting societies and transitions that are manifest both within and outside the formal state structures. Clearly, where there are coherent responses to water scarcity, these need to be nurtured.

An audit in specific regions would go a long way in establishing strengths and weaknesses in local knowledge regimes and could reduce costs and efforts required by the state to respond to gaps in delivery of water. As part of this audit, it would be useful to better understand the potential for DWAF officials to understand and maximise the strengths of traditional leaders, in other words their ability to understand not only technical issues around water matters but the complex set of social configurations that exist. Schizoid responses, experienced by some DWAF officials who find themselves operating in two quite different paradigms, indicate that there are parallel 'legal' systems that exist today and that need to be recognised and carefully considered. The paper proposes the integration of traditional structures, on a case to case basis, as a long term solution to both service delivery in those places where municipal structures are unable alone to offer clean drinking water to all consumers that fall under its jurisdiction, and as a long term solution to sustainable and effective integrated water resource management at the catchment level. The paper in particular draws a cautionary note against overriding existing structures that are able to respond efficiently and effectively to the management of the resource as well as the supply of water.

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Notes

1. Although customary water tenure structures can also be considered as formalised in their given context, the term formalised in the context of this paper refers to institutional structures legislated for in statutory law.
2. In the context of this paper the term customary (as well as the interchangeably used terms indigenous and traditional) refers to rules, norms and their enforcement of:
   - rural groupings whose livelihoods are predominantly based on small-scale agriculture (cropping, livestock, fisheries, hunting/gathering), and
   - whose socio-political cohesion is based on a sense of ethnicity, besides residence, and
   - for whom tribal authority plays a role in some or many domains of life, besides 'modern' local government and state-induced or private water management institutions.
3. The Water Management Areas were established by Government Notice No. 1160 (DWAF, 2004).

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Considerations on the composition of CMA Governing Boards to achieve representation

Guy Pegram and Eustathia Bofilatos

South Africa is embarking on a process of progressively establishing 19 catchment management agencies with the purpose of decentralising water resources management and involving local communities. There is a legislatively required process leading to the appointment of the CMA Governing Board, involving a recommendation on the composition of the Board by an Advisory Committee followed by nomination by identified organs of state and bodies. It is argued that this provides an appropriate mechanism to ensure adequate representation of the interests of rural, poor and marginalised communities, particularly as these groups trend to be relatively unorganised and non-cohesive at a water management area level. This hypothesis is supported by the recommendation on the Inkomati CMA Governing Board.

Keywords: catchment management, institutions, governance, representation, rural livelihoods, enterprise development, emerging farmers

Introduction

With the promulgation of the National Water Act (NWA: Act 36 of 1998) following the White Paper on a National Water Policy for South Africa (DWAF, 1997), the way in which water resources are managed in South Africa has been fundamentally changed. The cornerstones of the NWA are sustainability of resource development and utilisation, equity in access and allocation, efficiency in water allocation and use, and the establishment of appropriate and representative institutions for water resources management at a catchment and local level.

A process of fundamental institutional change is underway in the South African water resources management sector, with the establishment of Catchment Management Agencies (CMA) and the intended decentralisation of powers and functions from the Department of Water Affairs and Forestry (DWAF). Each CMA will be managed by a Governing Board representing local interests and institutions. The NWA provides a framework for the establishment of CMAs, but provides significant latitude in the way this is done. Over the past 5 years, DWAF has developed policies, strategies and guidelines on the establishment and functioning of CMAs to assist and ensure coherence in the process.

19 CMAs will be established across the country over the next 5 years, one in each of the 19 water management areas (WMA) defined through the National Water Resources Strategy (NWRS). It is important to note that WMA cover a relatively large area (on average about 20 000 km^2) and are extremely diverse in terms of population (ranging from about 400 000 people to over 5 million people), water use (from 300 million m^3/year to 1200 million m^3/year) and gross geographic product (from 1% to over 20% of national GGP). There are WMA with large numbers of poor rural people living on communal lands (such as the Mzimvubu to Keiskama in the former Transkei) and others with primarily urban dwellers and commercial agricultural (such as the Upper Vaal south of Johannesburg).

The Inkomati CMA has been established and the Minister is in the process of appointing the Governing Board, at least another three CMAs will be established during the 2005/06 financial year. Given the diverse nature of the various WMAs, the political and social imperatives to redress historical imbalances in access to water and government's objective to eradicate poverty, the role and composition of the Governing Board becomes critical in setting the strategic direction for the CMA. This is particularly important for the rural poor and marginalised communities that do not have access to water resources and are generally unorganised from a water resources perspective, but where access to even a limited quantity of water for productive purposes[1] can have a fundamental impact on household livelihoods and local enterprise development.

This paper explores these considerations around the composition of the CMA Governing Board and its implications for representation of poor communities and marginalised water users, as a means of including their interests in the strategic priorities and operational decision making by CMAs. The main focus of the paper is the legal requirement of the NWA and its interpretation in the process of appointing the Governing Board. However, the paper begins with some background to CMA establishment and the implications for integrated, participatory and developmental water resources management.

The establishment of Catchment Management Agencies

Chapter 7 of the NWA provides for the progressive establishment of CMAs, with the purpose of delegating water resources management to regional or catchment level and involving local communities. The process of establishing a CMA is based on the development of a Proposal to the Minister, which addresses the viability of the CMA and consultation process. Thus far, this process has been largely driven by DWAF regional office, but through the establishment of stakeholder structures to guide the development of the proposal. A key focus has been on the empowerment of historically disadvantaged groups (particularly their representatives) to participate and contribute to the process.

Each CMA will be established to become the key water resources management body within a highly contested water institutional environment with local government, provincial government, traditional leaders, water user associations, water services providers, international water bodies, sector representative bodies, non-governmental and community based organisations and other interest groups all wanting to influence, cooperate and/or dictate the way in which water resources are managed. Furthermore, the water resources in many parts of the country are already stressed, with the resulting disputes and conflicts between sectors and users.

For this reason, the early development of the CMA (in the first couple of years) should be focused on building its credibility and legitimacy as the main water management institution in the WMA. Upon establishment, a CMA has initial functions including:

- investigate and advise interest parties on the management[2] of water resources within the WMA
- develop a catchment management strategy that is consistent with the NWRS, as well as with local water services development plans of local government
- coordinate water-related activities of water users and water management institutions within the WMA
- promote community participation in the management of water resources

These functions should promote the stature of the CMA within the WMA, as long as they are implemented in a cooperative rather than authoritarian manner. It is therefore also envisaged that the responsibilities of controlling and enforcing water use authorisation (to support licensing or permitting of water use) will be transferred to the CMA early in its development (within the first 2 years), as this is the main interaction with water users and is an area in which the CMA should add value. A key principle of the CMA establishment process is that certain DWAF staff will be transferred to the CMA with these functions as a coherent "business unit" to ensure continuity of service delivery and institutional memory.

The concept of a service delivery oriented organisation is important, because a CMA will be largely funded through the collection of water use charges on registered water users (to fund the costs of water resources management activities)[3]. These may be supplemented by financial support from DWAF or from any other lawful source. The debate about level of financial support and for what functions is ongoing, particularly as an attempt to make a CMA entirely self-sufficient may introduce the perverse incentive to allocate water to those organised sectors that are willing and able to pay in the short to medium term. This may be in contradiction to the requirement for water allocation reform and redress of past imbalances in access.

Once these initial and early functions are being adequately implemented, other related water resources management functions would be delegated to the CMA, culminating in the responsible authority functions of authorising water use (i.e. issuing licences).

Implications for CMA governance

The challenge of establishing 19 new organisations over a period of 5 years has not been underestimated by DWAF. This is partly the reason that the first CMA has only been established 6 years after the promulgation of the NWA, particularly when one considers the need to:

- establish administratively and financially effective and *sustainable* organisations that
- enable the involvement and *participation* of water users and stakeholders (including historically disadvantaged groups), while they
- adopt an *integrated* approach to water resources management, which can
- contribute to social and economic *development* at a local level.

This will only be achieved by organisations that are based on an integrated consensus-seeking approach to decision making considering government's strategic objectives and the broad implications to all sectors, rather than negotiation and bargaining between narrow vested interests. Furthermore, the voices of the most marginalised segments of society need to be heard in these debates which itself requires a fundamental capacity building and empowerment programme.

In practice, people tend to participate in water resources management processes, where they have something to gain or loose. CMAs do not have the mandate to provide water supply and sanitation services to communities (as this is a local government mandate), which is generally the key water issue at a local level in South Africa. Until the rural poor have water allocations (or entitlements) and the means to support household livelihoods, enterprise development or small-scale commercial farming, or at least see the need to obtain these allocations, they are unlikely to broadly participate in CMA processes.

The issue is whether to delay CMA establishment until adequate local institutional development, empowerment and water allocation reform has taken place (to "even the playing field" over a period of 10 years) or whether to continue with the process of CMA establishment, focusing on capacitating rural and poor community representatives. The latter is dependent upon adequate representation on the governance structures of CMAs and decision making within a policy framework that reflects the objectives of redress and poverty eradication.

Over the past 15 years, DWAF itself has transformed from a relatively centralised technocratic management style, to one that is more decentralised and participatory in all parts of the country. This includes the recent restructuring process that will result in the creation of "proto-CMAs" within the DWAF regional offices, to be transferred to the CMA after establishment. However, DWAF is not accountable to the stakeholders in a WMA in the same way that a CMA would be and is unlikely to entirely fulfil the promise of integrated, participatory and developmental water resources management.

On the other hand, DWAF may be more able to make the locally difficult decisions required for environmental sustainability and water allocation reform, as it is one step removed from the influence of powerful organised WMA interests upon which the financial viability of the CMA may be dependent.

The need to establish CMAs to promote decentralised management, while requiring DWAF to ensure the "levelling of the playing field", has resulted in the policy of phased development of CMAs (over a period of 5 to 10 years) and the retention of certain key functions (such as water resources classification and compulsory licensing[4]) by DWAF.

From the above, it is apparent that the composition and mode of operation of the CMA Governing Board will largely determine whether the CMA contributes to integrated, participatory and developmental water resources management, with the empowerment of the poor and marginalised groups within the WMA. This is particularly critical for the first Governing Board, as they will oversee the creation of the CMA in its first 3 years, particularly in terms of its strategic direction (priorities) and organisational design (structure, systems staffing and culture)[5].

Composition of the Governing Board

While the preceding discussion has highlighted the importance of the CMA Governing Board, the legislated process and considerations for appointing members of this Board [in terms of Section 81 of the NWA] is of particular interest.

1. Before appointing members to the CMA Governing Board, the Minister of Water Affairs and Forestry must appoint an Advisory Committee, to recommend "*which organs of state and bodies representing different sectors and other interests within the water management area of the catchment management agency should be represented or reflected on the governing board*" and "*the number of persons which each of them should be invited to nominate*" [Section 81(3)].
2. The Advisory Committee must "*consult with the relevant organs of state and interest groups before making its recommendations*" [Section 81(4)]
3. The Minister must "decide which organs of state and bodies will be invited to nominate representatives for appointment to the governing board, and the number of representatives each may nominate", based on the Advisory Committee's recommendations [Section 81(5)].
4. Once nominations have been made, the Minister must appoint the nominated persons in accordance with the invitation [Section 81(7)]. Three nominations will be requested for each seat on the Board, from which the Minister should be able to appoint a Governing Board that represents interest, demographic, gender, community and expertise requirements. The Minister may appoint additional members to balance the Board where these considerations are not met [Section 81(10)].

What is remarkable about this approach is that the size and composition of the CMA Governing Board is recommended by the Advisory Committee, while the individuals are nominated by the institutions representing the various interests identified for representation. This approach should result in a balanced Board, but with individuals that have legitimacy within their sector or interest group. It also enables the Minister to construct a Board with the required profile, based on the options of multiple nominations per seat.

This differs from the approaches that are typically adopted for appointing public sector Board members, namely publicly calling for nominations or holding elections for the office. These approaches tend to be biased towards organised groups, at the expense of unorganised, poor and marginalised groups, particularly in the context of a South Africa's political history, uneven access to resources by different groups, and newly emerging democracy. They would likely contribute to the continued marginalisation and exclusion of large portions of the population.

However, it places considerable responsibility on the Advisory Committee, and therefore its composition becomes important to the process. The existing policy is that an Advisory Committee of between 7 and 10 individuals be appointed with the following composition:

- a Member of National Parliament (preferably from the WMA),
- a member of the Minister's National Advisory Council (who knows the WMA),
- an official from each Provincial Government within the WMA (through the Office of the Premier),
- a representative of organised Local Government at the Provincial level, and
- 2 or 3 individuals that were part of the process of compiling the Proposal to the Minister for the Establishment of the CMA (nominated by the relevant stakeholder committee/s).

In appointing the Board, the Minister must consider the objective "*of achieving a balance among the interests of water users, potential water users, local and provincial government and environmental interest groups*" [Section 81(1)]. This provides an important basis for the Advisory Committee to not only consider the existing major users of water. From a rural development perspective, the Governing Board should represent people and communities that may have an interest in utilising water for household livelihoods, enterprise development or small-scale agriculture/irrigation.

At one level, the process of the Advisory Committee may be relatively simple, namely to identify all the interests in the WMA and provide them representation according to criteria around use of water, social and economic development, government mandates, and sustainable development. However, this is complicated by the DWAF guideline that the Governing Board should consist of between 9 and 15 members, in terms of good

governance practice. This drives the concept of trade-offs between interests and the difficulty in weighting representation according to membership, as there are generally in excess of 15 interest groups.

While this is a complication for the Advisory Committee, it is a potential advantage to the CMA Governing Board, because it is likely that no one "block" will have a majority on the board, but rather that different groupings may find alignment in interests on different issues. In other words, in the absence of domination from a majority block, one may hope that there is a drive towards consensus and cooperation, rather than polarisation. This is further reinforced by the responsibility of Board members to act in the interest of the CMA and the duty to "*exercise reasonable care and diligence*" [in terms of Schedule 3 of the NWA].

A means of addressing the representation problem at the CMA Governing Board level is the possibility of establishing committees on a catchment (geographical) or functional (issues) basis [in terms of Section 82(5) of the NWA]. Most of the nine stakeholder Proposals to the Minister on Establishing a CMA, that have been or are being developed at this stage, recommend the establishment of one or more representative catchment management committees of this nature.

These committees will generally consist of Governing Board members, CMA staff, stakeholder representatives and/or technical specialists, and provide an opportunity to include sector and interest group representation reflecting the local situation in a catchment. In many WMA, there are fundamental differences in the demographics, economic activities, and water resources problems between catchments that can be dealt with at this level. Where consensus can be reached between interests at this level,

Experience of the Inkomati CMA Governing Board

At the time of writing of this paper, the Advisory Committee for the establishment of the Inkomati CMA has made a recommendation to the Minister. It is instructive to review this committee's recommendation and its potential implications for rural and poor households.

The Inkomati water management area is situated in the north-eastern part of South Africa and borders on Mozambique and Swaziland. All the rivers from this area flow through Mozambique to the Indian Ocean. The Komati River flows into Swaziland and re-enters South Africa before flowing into Mozambique. Topographically the water management area is divided by the escarpment into a plateau in the west and a subtropical Lowveld in the east.

Economic activity is mainly centred on irrigation and afforestation, with related industries and commerce, and a strong eco-tourism industry. A key feature of the water management area is the renowned Kruger National Park. The Sabie River, which flows through the park, is ecologically one of the most important rivers in South Africa, while the Crocodile River forms the park's southern boundary. There is a significant impoverished rural population in the former homeland areas in the eastern part of the WMA. The water resources in the WMA are highly stressed, but there is a significant need to reallocate water to emerging farmers with access to land and to communities for productive purposes. In line with national government's objectives, there is a major programme of water supply and sanitation delivery to the rural communities in this area.

A Board of 14 people was proposed with the following composition (from the recommendation to the Minister):

1. *Commercial Agriculture:* primarily representing commercially irrigated sugar cane and fruit in the Inkomati WMA, but includes other commercial irrigated crops, livestock and dryland farming.
2. *Existing Agriculture by Historically Disadvantaged Individuals (Emerging farmers):* primarily representing existing small-scale irrigation by historically disadvantaged individuals, but includes the existing interests of stock watering and other agricultural activities by these groups within these areas.
3. *Potential Agricultural Water Use by Historically Disadvantaged Individuals:* representing the interests of those individuals with access to some land for agricultural production (particularly those engaged in dryland farming or beneficiaries of land reform), but who currently have no entitlement or access to water. This reflects the interests of groups that may require reallocation of water and/or local infrastructure development to enable the use of water for small-scale irrigation farming. The important element of this representation is

an understanding of the needs of this relatively marginalised group in the broader process of water resources planning, utilisation and development.

4. *Streamflow Reduction (Forestry):* representing streamflow reduction activities defined under the NWA, which currently includes only forestry, in terms of both large commercial and small emerging forest growers.
5. *Industry, Mining and Power Generation:* broadly representing the industrial, manufacturing, commercial, mining and power generation sectors that use water and have a significant contribution to the economy of the WMA.
6. *Tourism and Recreation:* representing the interests of tourism and recreation associated with the water resource, including fishing and aquaculture.
7. *Conservation: r*epresenting the formally established national and provincial parks, as well as conservancies and community conservation initiatives.
8. *Productive Use of Water by the Poor:* representing the potential productive use of water in local enterprise by poor and marginalised rural households (focusing on women) to improve their livelihoods, including but not limited to Schedule 1 use. There are two related but distinct elements of this productive water use, namely the use of water to support local enterprise development and the use of water to support rural household livelihoods[1]. This reflects the need to represent this type of water use and the associated support requirements in the use of that water, though an understanding of the opportunities and constraints on productive water use to address poverty.
9. *Civil Society - Resource Protection and Sustainable Development:* representing civil society environmental interests in the protection of water resources, for ecological sustainability and sustainable utilisation of water and associated resources by local communities. This reflects an understanding of the utilisation of local resources and products for productive, subsistence and social activities.
10. *Local Government - Integrated Planning:* representing the local government mandate for integrated planning and development, particularly in terms of the Integrated Development Plan process and associated plans.
11. *Local Government - Water Services Authority:* representing local government mandate for water services planning and service delivery (as a water use for domestic and industrial consumers).
12. *Traditional Leaders:* representing traditional leaders as an institution of local governance with a role in the management of communal land in the former homeland areas.
13. *Mpumalanga Provincial Government: r*epresenting relevant Mpumalanga Government interests in the majority of the WMA, including agricultural, environmental management and development planning responsibilities.
14. *Limpopo Provincial Government:* representing relevant Limpopo Government interests in the northern part of the WMA, including agricultural, environmental management and planning responsibilities.

For each of the formally organised groups one or more recognised representative institutions or bodies are requested to proposed nominations for the relevant seat, and the process of identifying those nominations is not prescribed. However, for the less formally organised seats (particularly 2, 3 and 8), a process is being conducted to bring representatives of that grouping together from across the WMA, to facilitate the identification of nominations. During this process, these representatives are expected to consult locally.

A review of this recommendation highlights representation of the main existing water users, balanced by the interests of emerging and prospective water users, particularly historically disadvantaged individuals, the rural poor and women. It also effectively represents local and provincial government, focusing on their relevant mandates for development planning and service delivery. Environmental interests are also adequately represented through relevant government, private sector and civil society representation.

A remarkable development is the recommendation for 4 seats to directly represent the different interests of the rural poor (in addition to their partial representation through the Local and Provincial Government seats), namely Seat 2 and 3 for emerging farmers (with and without water allocations), Seat 8 for productive use of water for household livelihoods and local enterprise development, and Seat 9 for the interests of people using the resource directly in terms of the "goods and services" it provides.

As implied above, there is no one block that can dominate the decisions of the Board, but rather a process of consensus seeking and alignment will be needed. The recommendation also highlighted the need for representation of catchment areas at the Governing Board level to be considered in the appointment of the Board members, supported by the establishment of catchment management committees in 5 distinct sub-catchment areas within the WMA. This was in addition to the need for demographic, gender and expertise related representation on the Governing Board.

While this Board is at the upper end of the DWAF size guideline, it was deemed to be important during the process of building the CMA legitimacy, as well as trust and maturity between sectors and interests in the management of water resources. In the future (after 5 to 10 years), this representation may be reduced to a Board of 8 to 10 members representing multiple interests and expertise.

Conclusions

The paper has outlined the legislative requirements for representation on CMA Governing Boards and highlighted the way that this may be used to support the interests of rural and poor communities in obtaining improved access to water. It has illustrated the advantage of the process through the experience of the Advisory Committee for the Inkomati CMA Governing Board leading to an outcome that would have been unlikely through an electoral or public nomination process.

However, ultimately the process will be dependent upon the calibre of the individuals nominated to represent the interests and their ability to voice the needs rural and poor communities within different WMA. The South African water sector waits with baited breath for the outcome of this brave new experiment in institutional change.

References

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Notes

1. In the South African context, it is important to distinguish water supply for domestic purposes, which is the Constitutional responsibility of local government, from allocation of water resources for productive purposes, which is a national (DWAF) responsibility. However, in practice these lines become blurred, because access to water for productive use includes the infrastructure required to bring the water to the household, which may be linked to the water supply system. The difficulty is that this is treated (and therefore expensive water).
2. The NWA refers to the "protection, use, development, conservation, management and control of the water resources", which for convenience in this paper has been referred to as *management* of water resources.
3. The collection of user charges for water resources management has only been implemented over the past few years, following the establishment of the Pricing Strategy. This is a critical challenge to CMA viability, as the recovery rates from sectors that have not previously paid for water (particularly agriculture and forestry) are still relatively low and users are asking what value or benefit are they receiving for payment.
4. The classification process entails balancing the need to protect and sustain water resources with the need to develop and use them, according to WMA and nationally based ecological, social, economic and political imperatives. Compulsory licensing represents the process of fundamental reallocation of water use entitlements, particularly to ensure sustainability of the resource and/or redress past imbalances in water allocations.
5. Schedule 3 [Section 1(2)] of the National Water Act specifies the role of the Governing Board "*to decide the strategies and policies to be followed by the institution*" and "*to ensure that the institution exercises its powers or performs its duties in a proper, efficient, economical and sustainable manner*."
6. While only one representative is recommended, the Minister was advised to monitor the performance of the Governing Board in terms of both enterprise development and household livelihoods, and if necessary to appoint separate representative for these two interests.

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The authors acknowledge the diligence and effort of DWAF staff over the past 5 years in developing and implementing the policies and guidelines for CMA establishment that made this paper possible. Furthermore, the courage and insight of the Advisory Committee on the Inkomati Governing Board is recognised as the basis for many of the thoughts and debates presented in this paper. Finally the stakeholders that have participated and are yet to participate in the establishment of CMAs in South Africa are praised for their perseverance and contribution to the debate, particularly those individuals from poor rural communities that seized the moment and fundamentally influenced the way in which we think about institutional development for water resources management.

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Engaging disadvantaged communities: Lessons from the Inkomati CMA establishment process

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South Africa is currently establishing 19 basin-level governing-bodies called Catchment Management Agencies (CMA's). CMA's are responsible for implementing South Africa's new water management approach that aims to foster economic development and poverty eradication, while maintaining the ecological integrity of the system. The first CMA was established in the Inkomati catchment area in March 2004 and the minister, based on the recommendations of the advisory committee, will soon appoint a governing board. The Inkomati CMA was established after seven years of public participation and stakeholder negotiations. Based on an analysis of the participatory process to draft the Inkomati CMA proposal, this paper outlines specific challenges that lie ahead for the Inkomati governing board and the successful implementation of the Inkomati CMA. The paper identifies specific ways to engage disadvantaged communities in the CMA process.

Keywords: Catchment management, public participation, integrated water resource management, empowerment, disadvantaged communities, rural water allocation

Introduction

Integrated Water Resource Management (IWRM) has been promoted heavily in the policy arena.[1] At the World Summit on Sustainable Development held in Johannesburg in 2002, the international community called for all countries to "develop integrated water resource management and water efficiency plans by 2005, with support to developing countries" (Global Water Partnership Technical Committee, 2004). There is general agreement among policy makers, researchers, and water managers that sustainable, integrated water resource management must be done at the level of the river basin or catchment.[2] (Merrey, 2003). Jaspers (2003) considers the institutional arrangements required to implement integrated water resource management and identified stakeholder participation as a "crucial issue," without which water resources planning "is highly ineffective." Many countries have reformed their policy environment to include an emphasis on stakeholder participation and basin-level management.[3] Moving these concepts beyond policy to implementation is the real challenge, particularly in the developing world and the few successfully case studies of IWRM, known to date, are "in rich countries with strong institutional capacities and well-educated publics" (Merrey, 2003). The notion of success in IWRM is also problematic as there are as many measures of success as there are stakeholders at the table. In the developing world, a key criterion for successful IWRM should be the degree to which the approach empowers disadvantaged and marginalized communities to foster poverty eradication and the equitable distribution of natural resources.

South Africa's new water management paradigm could, if effectively implemented, represent a unique approach to IWRM for the benefit of disadvantaged communities. The three main aims of South Africa's approach, introduced under the National Water Act (Act 36 of 1998) and Water Services Act (Act 108 of 1997)[4] are to address the inequalities of racial and gender discrimination, link water management to economic development and poverty eradication and ensure the ecological integrity of the resource (Schreiner et al, 2002). South Africa is currently establishing 19 basin-level governance bodies, called Catchment Management Agencies (CMA's) that will be responsible for implementing this approach. The initial functions of the CMA are planning, co–coordinating, and promoting public participation in water management. These functions can be expanded to include setting and collecting water use charges, and issuing water licenses (Schreiner et al, 2002). Public participation and community representation are legally required throughout the process of establishing and running CMA's.

The first CMA in South Africa was established in the Inkomati catchment area in March 2004 and the minister, based on the recommendations of the advisory committee, will soon appoint a governing board. The Inkomati CMA was established after seven years of stakeholder engagement and political negotiations. The CMA process involved an extensive public participation process to draft a proposal that outlines the details of water management in the Inkomati area as well as agreement on the structure and functions of the CMA. The participatory process faced many challenges because it needed to engage disadvantaged communities in complex decisions over scarce water resources. These decisions needed to be made with equal participation from more empowered and knowledgeable water users, such as commercial agriculture. Based on an analysis of the participatory process to draft the Inkomati CMA proposal, this paper outlines specific challenges that lie ahead for the Inkomati governing board and the successful implementation of the Inkomati CMA. The analysis is based on fieldwork conducted between August 2000 and January 2001. The fieldwork involved interviews with 62 stakeholders that were involved in the participatory process.[5] The findings of this paper draw specifically on the results of interviews conducted with disadvantaged communities.[6] In this context, disadvantaged communities include historically disadvantaged sectors, such as emerging commercial farmers,[7] subsistence farmers, tribal authorities and community-based organizations and local governments working in poor areas. Before discussing the challenges, the paper provides some contextual information on the Inkomati Catchment Management Area and the participatory process to draft the CMA proposal.

The Inkomati Catchment Management Area

The Inkomati Catchment Management Area is defined in government notice No 1160, published in the gazette on 1st October 1999. The area is located in the province of Mpumalanga, with a small section falling into the Northern Province. The Inkomati River system is an international system, originating in South Africa, flowing partly through Swaziland, and then traversing Mozambique before flowing into the Indian ocean near Marracuene (DWAF, 2000). The area consists of three sub-catchments: the Komati, the Crocodile, and the Sabie-Sand. Integration of these river systems only occurs in Mozambique, at the confluence of the Komati and Sabie, and so without inter-catchment transfers there is little hydrological connection between these three sub-catchments (Brown and Woodhouse, 2004). Within the catchment there are numerous stakeholders with an interest in water management. These include: agriculture, forestry, energy, mining, industry, conservation, local and provincial government, civil society, tourism, recreational fishing, emerging commercial farmers, traditional leaders, and water boards. Irrigated agriculture is the most important economic activity and the main consumer of water (Woodhouse and Hassan, 1999). The present population is estimated to be 1.85 million, fifty percent of which have poor access to drinking water and sanitation facilities (DWAF, 2000). Certain areas in the catchment, such as the Nkomazi region, are considered over-allocated "in which no more water allocation licenses will be granted" (Brown and Woodhouse, 2004). Limited water supplies are preventing socio-economic development and the expansion of commercial agriculture and water supplies for disadvantaged communities. This makes water allocation a sensitive and politically charged issue.

Participatory process to draft the Inkomati CMA proposal

The process to establish the Inkomati CMA began in 1997 and was conducted through the regional office of the Department of Water Affairs and Forestry (DWAF), with assistance from local consultants. The process began before the implementation of the new Act and was initially focused on establishing institutions that were representative of all water users. With the drafting of the new Act, the process evolved to focus on the development of a proposal for the establishment of the Inkomati CMA. Separate public participation processes were first conducted in each of the three sub-catchments until October 1999. The three groups were then brought together to form the Inkomati Reference Group. Based on the meeting minutes, administered by the DWAF, a total of 54 meetings were held in the three sub-catchments and seven meetings were held for the combined Inkomati Reference Group. In September 2000, the reference group submitted a final proposal for the establishment of the Inkomati CMA to the Minister of Water Affairs and Forestry. DWAF requested changes to the format of the proposal and it was resubmitted in October 2001. The reference group has not met since September 2000 and there has been "little activity" on the proposal for more than two years. In February

2004 the new advisory committee met for the first time and on the 30th March 2004 the Inkomati CMA was launched, in time for the 2004 general election (Brown and Woodhouse, 2004).

The advisory committee has submitted recommendations to the Minister for the establishment of 14 people on the governing board. In terms of the Act the "size and composition of the CMA Governing Board is recommended by the Advisory Committee, while the individuals are nominated by the institutions representing the various interests identified for representation" (Pegram and Bofilatos, 2005). According to Pegram and Bofilatos (2005), the proposed governing board represents the main existing water users, balanced by the interests of emerging and prospective water users, particularly historically disadvantaged individuals, the rural poor and women. The interests of the rural poor are represented by 4 seats on the board. The advisory board has done well to deliberately design a governing board that seeks to give voice to disadvantaged communities. However, based on the participatory process to draft the CMA proposal the governing board faces many challenges that need to be overcome before disadvantaged communities will actually benefit from the CMA. This paper outlines some of these challenges.

Challenges to engaging disadvantaged communities

Legitimate representation

Based on the experience of the participatory process, obtaining legitimate representation from disadvantaged communities is a huge challenge. Compared with established networks amongst white commercial farmers, disadvantaged communities have weak networks of emerging commercial farmers and subsistence farmers, with less knowledge and experience in water management. Furthermore, representatives from networks such as the Mpumalanga African Farmers Union (MAFU) are disempowered because they do not have the capacity to feed information back to their sectors. "How do you expect a person without resources to feedback to people? To feedback to people, you need communication networks. … First of all he has no car. How does he go to places, arrange meetings and call people together?" (Inkomati Reference Group Member). In addition, some representatives attended meetings to obtain the transport compensation or free lunch provided by DWAF. "Some will actually get to the meeting and from the start of the process to the end they never open their mouths to speak. They just go, sit, eat, claim money, and go home. And you wonder if these people actually represent the interests of the communities?" (Inkomati Reference Group Member). The location of some meetings created additional challenges as some were held "somewhere in the suburbs, where you can't expect somebody with a taxi to reach" (Inkomati Reference Group Member).

The governing board has only nominated the sectors to be represented and not the individuals who will sit on the governing board. These nominations will come form the sectors themselves. The governing board calls for one individual to represent existing agriculture by historically disadvantaged individuals and one for potential agricultural water users by historically disadvantaged individuals (Pegram and Bofilatos, 2005). Obtaining the correct people to represent these sectors effectively is a huge challenge and will only be achieved if resources are placed into expanding the effectiveness and capacity of organizations such as MAFU. Additional resources are also required to expand and strengthen Water User Associations in the region.[8]

Obtaining representation in the area is further challenged by the fact that the Inkomati Reference Group has not met since September 2000 and there has been little activity during 2002 and 2003. This will create difficulties in re-engaging stakeholders as "many stakeholder contact details have changed and several representatives, particularly industry, have left the area" (Brown and Woodhouse, 2004). Many stakeholders have also experienced "participation fatigue" and may not be willing to attend and participate in more discussions on the CMA. Engaging these stakeholders will require additional effort and resources.

Raising public awareness

An effective public outreach campaign is a crucial component of a participatory process, especially in areas that do not have established networks and representative organizations across all sectors. Good public awareness creates opportunities for all voices to be included in the process, leading to good and accountable representation. Public Awareness in the CMA process was particularly weak. One stakeholder believed that if you were to "make a random survey" few people in disadvantaged communities would have any knowledge of

the CMA. Brown and Woodhouse (2004) refer to a recent survey of CMA awareness, commissioned by DWAF. The survey involved ten focus groups with 6 to 8 representatives from urban and rural black populations, in every case respondents had no knowledge of the CMA.

The participatory process should include a focused campaign that uses media and outreach campaigns to inform the general public and to assist in obtaining a representative body that fairly represents all water users. An informed public and media also play a crucial role in keeping representatives accountable. This "western" model of representation is much more difficult to implement in an African context because electronic communication infrastructure is not well developed. Mediums, such as internet and television, used extensively and cheaply in rich countries are not available to inform the public. It is therefore very difficult "to create the kind of public awareness of the large river basin issues that is found in water-scarce basins in rich countries" (Molden and Merrey, 2002, p. 153). Solutions that are tailored to the African context are needed. After an extensive survey, Houston et al (1999) showed that radio is the best medium to reach disadvantaged communities in South Africa. An Inkomati reference group member suggested that "radio, children at school, church announcements" are sometimes more effective ways of reaching disadvantaged communities than through leaders because "in the communities you will find self-start leaders who are only trying to create an image for themselves." Public awareness campaigns require resources to be effective and the governing board will have to consider creative ways to engage and inform diverse water users, particularly as it begins to develop the catchment management strategy.

Creative and accessible communication

Effective participation from disadvantaged communities requires more than just getting the parties to the table, but involves a sensitivity to the type of communication strategies that will empower and engage all sectors. Brown and Woodhouse (2004) comment that "effective representation is not achieved simply by black stakeholders being physically present in meetings. Rather it is achieved through their active involvement in discussions." The communication style of the meetings during the participatory process often disempowered stakeholders who were not familiar with technical terms. "Sometimes they will put figures and calculations on the screen and [some] black communities will go out without understanding anything. Even other communities will go out without understanding anything and then people just get frustrated" (Inkomati Reference Member). In general, the meetings consisted of presentations from consultants and DWAF officials with opportunity for discussions and feedback on the concepts in the draft CMA proposal. The meetings did not provide enough opportunity for two-way communication from consultants to stakeholders. One tribal authority member felt that they "did not have permission to speak," while an emerging commercial farmer complained that "they did not have time to listen to stories. …If they come to us they bring their own agenda."

The range of cultures involved in the process requires diverse opportunities for interaction and communication between participants. The meetings usually focused on technical exchanges of information, which disempowered many sectors unfamiliar with this mode of information exchange. Le Baron (2002) emphasises the importance of creativity to bridge gaps between cultures. She discusses the importance of finding tools that overcome conflict and to develop the capacities for relationship and a fluency in creative processes. These approaches help respond to conflict with resourcefulness, spontaneity, and ingenuity. Fieldtrips are a good example of a more creative space for natural interaction between stakeholders and were used by stakeholders in the Sabie-Sand catchment with some effect. "It is much easier when you bring somebody to the place because there is a much more relaxed atmosphere. In the meetings you just look at each other. …If I were to improve on the process, I would have started off with that. Get all the people to know the sectors, just to get everyone on board and start building a little bit of a team feeling" (Inkomati Reference Member).

The governing board will need to find creative ways to combine different communication styles across the sectors. The traditional "western meeting format" may not meet the needs of all sectors and opportunities will need to be found to share stories in a more informal space.

Accurate and reliable information

During the participatory process there was a lack of clarity on important data such as the water balance (reconciliation of water requirements and water availability) for the 3 sub-catchments. This created tension

between stakeholders as each sector blamed the other for water scarcity and over-allocations. Much of the confusion was linked to a lack of transparent data on water allocation for previous homeland areas, commercial farmers and new agricultural schemes.[9] The Ecological Reserve determination was also not available during the process and so it was difficult to calculate how much water was available for allocation. A participatory process for water management should "include a comprehensive joint fact-finding process, whereby the participants jointly describe what information they need to make a decision" (McGinnis et al., 1999). The stakeholders would have engaged in more effective and productive discussions if they had been provided with accurate information throughout the participatory process. The process needs to be as much a search for a definition of the problem as a search for the problem's solution (Forester, 1998). To reach agreement on a suitable institution to address water management issues stakeholders need to work from a common understanding of present water management issues so that they could build an institution that can address these challenges.

Since 2000, DWAF has confirmed that there is a negative water balance in all but the Sand sub-catchment and that no more water licences will be issued in the area because it is considered a "closed" catchment (Brown and Woodhouse, 2004). However there is still a lack of clarity on water scarcity in certain regions, such as the Nkomazi district. To make informed decisions the governing board will need to feel confident that water use information is transparent and verifiable. DWAF's water use verification exercise involving digital imaging and positioning technology is a critical component of the decision-making for the CMA (Brown and Woodhouse, 2004) but it is highly likely that certain sectors will question the validity of the data based on the amount of misinformation that has been communicated to them in the past. DWAF will need to clearly and transparently explain the process of collecting and verifying the data so that it is accepted by all sectors.

Implementing a common vision

The participatory process did not generate a common vision amongst stakeholder on the function of the CMA. Some believed the CMA would maintain current water licensing but simply provide more funding for water management costs, while others believed the CMA would be a vehicle to aid the plight of the poor by providing water licences to emerging commercial farmers. Much of the confusion can be attributed to the fact that this was the first CMA process in the country and DWAF was embarked on a learning process. However, DWAF officials at both regional and head office needed to be more conscientious in conveying consistent information to stakeholders and consultants. One reference group member commented that at one meeting they were given "different message from two people at head office on the same day."

Through the participatory process many stakeholders from disadvantaged communities were given the impression that the CMA process was delaying their access to water. One of the lead facilitators in the process commented that the emerging commercial farmers were "easily manipulated" into supporting any institution because "their need is to get water rights and to get development… It does not matter what structure is in place, they just want results." Many emerging commercial farmers felt that there was "nothing [in the final proposal] from the emerging farmers." At the final reference group meeting a number of emerging commercial farmers strongly objected to the final proposal and requested a separate caucus outside of the general meeting. The proposal was finally allowed to move forward provided that there was a separate process initiated to address their concerns about water access and allocation. Based on the lack of activity in the CMA region over the last two years, it is unlikely that such a process has been comprehensively followed-up on. As discussed in the previous section, although the CMA may have some role in addressing water allocations the current delays are due to factors beyond the CMA process. Disadvantaged communities who were not familiar with the complexities of water allocations wanted to move the process forward and were reluctant to allow any of their concerns and question to delay the process. Governing board members from disadvantaged communities may have developed unrealistic expectations on how the CMA will meet their needs and could easily become impatient in the process of developing a catchment management strategy. Balancing the importance of long-term planning for water management with the need to address the urgent, and understandably impatient, concerns of the poor will be a significant challenge for a pro-poor governing board.

DWAF will need to assist the governing board in developing a common vision of how the CMA will function to benefit all water users. The formulation of the common vision does not have to follow a formal process of searching, but it should follow a conversational model, allowing participants to create new meanings together

(Forester, 1989). This issue is critical in keeping all stakeholders at the table. Building this common vision involves a common learning experience, not a one-way flow of knowledge from government and technical experts to the stakeholders. All participants will need to become active learners in the process.

Facilitation and conflict resolution skills

To facilitate the participatory process DWAF hired an engineering consultancy firm and an environmental management consultancy firm. A non-profit rural development organization active in the Sabie-Sand area facilitated the process in the Sabie-Sand catchment. Overall, stakeholders from this Sabie-Sand sub-catchment were noticeably more trusting of the facilitators and more supportive of the entire process than stakeholders from the other two sub-catchments. This supports the importance of using facilitation expertise from organizations that are trusted within local communities. Many stakeholders were also more comfortable working with DWAF staff than the hired consultants as some believed the consultants were just in it for the money. Unfortunately, the few DWAF staff members that were involved in the process from 1997 to 2000 have left the Nelspruit regional office, leaving a loss of institutional memory on the CMA process.

The team of facilitators were strong in their hydrological knowledge of water management but did not have sufficient skills to engage and empower disadvantaged communities and to coordinate a complex public participation process. More emphasis needed to be placed on building a team of facilitators that have expertise beyond just the technical aspects of water management. Dorcey (1987) commented that "participants in water resources management often have serious weaknesses in these interaction skills, and that as a result, mechanisms for co-operation and conflict resolution fall short of their potential" Schreiner et al (2002) support this comment and acknowledge that "many of the DWAF staff currently involved in the development of CMA's are by training and experience, technical water management professionals, mainly scientists and engineers." Facilitators of the CMA process need to develop skills to run complex participatory processes, including skills in conflict resolution, negotiations, and facilitation." These skills cannot some from consultants alone, because of the "temporary and ad hoc nature of their involvement" (Schreiner et al, 2002).

Conflict is an inherent feature for many marginal groups who are seeking to redress injustices in resource distribution. Although "confrontation could lead to violence, avoiding and shunning conflict can be equally dangerous" because misunderstandings or confusion can simply escalate into more intense conflicts as the number of people involved and the problems multiply (Buckles and Rusnak, 1999). An important addition to the suite of skills required to deal with the inevitable conflicts that lie ahead is the ability to model and promote active listening amongst sectors. "In a world where people do not listen to one another, there can be no collective mobilization or organizing, no collective social or political life" (Forester ,1989, p. 118). In addition, "western traditions of conflict management need to be balanced with the systematic study of local practices, insights, and resources used to manage conflict. Diverse, local insights and methods are critical sources of innovation" (Buckles and Rusnak, 1999). For the CMA process to work, DWAF will need to focus significant attention on understanding local approaches to conflict resolution and resource distribution. Practitioners will need to "bracket" their "own cultural definitions of equality, and ask questions about local understandings of equality and reciprocity" (Buckles and Chevalier, 1999).

Building consensus

Each of the three sub-catchments is a separate hydrological unit within South Africa, with different socio-politcal contexts and economic drivers. The proposed governing board is made up of sectoral representation with no seat on the board specifically assigned to geographic representation for the sub-catchments. The 14 seats on the board are at the upper limit of DWAF size guideline, making it difficult to include geographic representation. However, this does create difficulties in encouraging board members to see beyond their sectoral perspectives.. The advisory committee emphasised the importance of balancing geographic representation across the whole catchment area but the board will also need individuals who are responsible for considering how decisions will affect each of the sub-catchments. Consensus will only happen when stakeholders are able to see beyond their narrow sector to understand that decisions need to be made for the whole catchment or sub-catchment.

Power imbalances

Although the proposed governing board provides a strong voice for the disadvantaged communities these communities continue to face significant power imbalances, in knowledge and expertise, compared with established commercial agriculture. As Brown and Woodhouse (2004) comment, "commercial farmers and irrigation boards are in a potentially strong negotiating position to influence the future direction of CMA because they possess the most detailed knowledge of water use by agriculture." During the participatory process commercial agriculture often threatened to withdraw from the process as they felt their concerns were not being address. They were particularly concerned with the pricing strategy that was perceived as an additional cost for a service that they felt was unnecessary. Commercial agriculture does have considerable financial influence over the future of the CMA as they are the largest water users and therefore contribute most significantly to the recently implemented Water Resource Management Charge (WRMC). The WRMC will eventually be the funding support for the CMA. Currently, most irrigation board are withholding payment of the WRMC (Brown and Woodhouse, 2004). The proposed governing board recommends only one place for commercial agriculture and while one should not be able to "buy" more seats on the board through the level of financial contribution, it does place the CMA in practical difficulties if it is unable to keep established agricultural willingly involved.

Without significant effort to engage commercial agricultural it is likely that they will either withdraw entirely from the CMA process or the sector will be become deeply fractured with only a small minority of commercial farmers contributing to the process. Brown and Woodhouse (2004) confirm that the concerns raised by commercial farmers in interviews in 2000 are still apparent. Their interviews, conducted in March 2004, clearly showed that "Commercial farmers were deeply unhappy about the CMA and its implications." This is a concern for the viability of the CMA. Buckles and Rusnak (1999) argue that "although in many settings marginalized groups must be empowered to undertake problem analysis and formulate strategies for negotiation, change will only come about if the powerful are moved to act on the causes of marginalization, inequity, and mismanagement. The conditions, and related pressures, needed to accomplish this movement are not well understood and rarely studied." To make catchment management work and to truly empower the poor, the water sector in South Africa needs to build techniques to transform the most powerful actors to understand the needs of the poor and marginalized. This issue is often overlooked amongst competing research agendas. An analysis of power dynamics within powerful water sectors would make a valuable contribution to South Africa's water management discourse and would require a combined effort from DWAF, research institutions and water management practitioners.

Conclusion

The complicated socio-political issues at play in the Inkomati, as well as the fact that this was the first CMA in the processes to be initiated, have created opportunities to learn improved techniques to engage disadvantaged communities in IWRM. As Pegram and Bofilatos (2005) argue, ultimately the success of the Inkomati CMA will depend on the calibre of the individuals nominated to represent the interests and their ability to voice the needs of rural and poor communities. In addition, these individuals will need to see beyond sectoral interests to build a common vision for catchment management; to see the importance of raising public awareness and establishing effective local representative bodies; and to use creative methods of communication based on reliable and transparent sources of information. To assist in the process, DWAF will need conflict resolution expertise drawn from local knowledge and experiences. Drawing from an anthropological perspective on conflict in natural resource management, Buckles and Chevalier (1999) conclude that "what matters in the end is that there be adequate understanding of how power differentials, local and institutional, play themselves out in particular situations of environmental conflict management." The challenges that lie ahead for the Inkomati CMA are likely to occur in other catchment processes in South Africa and DWAF will need to apply these principles as it seeks to establish a further three CMA's over the next year.

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Notes

1. Integrated water resource management is defined as the management of surface and subsurface water in a qualitative, quantitative and environmental sense for a multi-disciplinary and participatory perspective. There is a focus on the needs and requirements of a society at large with regard to water at the present and in the future, thus aiming at maximum sustainability in all senses (Jaspers, 2003).
2. The terms, river basin, watershed and catchments can be used interchangeably. The term watershed is used predominantly in North American literature while, catchment is used in South Africa, Australia and New Zealand. A watershed/catchment is defined as an area of land bounded by topographic features of height that drains waters, through a stream and its tributaries to a shared destination. A watershed also captures precipitation, filters, and stores water and determines its release. Watersheds vary in size. Every waterway (stream, tributary, ect) has an associated watershed, and smaller watersheds join together to become larger watersheds.
3. Some of these countries include Zimbabwe, Indonesia, Tanzania, Australia, South Africa, Mexico, Turkey, Sri Lanka, and the European Union under the new Water Framework Directive.
4. National Water Act is generally concerned with the management and supply of water, while the Water Services Act specifically deals with the regulatory framework for the supply of water and sanitation by local authorities to their respective areas and to set out conditions under which these are supplied to consumers (Glazweski, 1998).
5. For more details on the research methodology and fieldwork see Anderson (2000).
6. Of the 62 interviews conducted, 18 interview were conducted with individual involved in the process who directly represented disadvantaged communities. In addition three group discussions were held with emerging farmers from Kanyamazane, with emerging farmers from Mzinti and with a tribal authority in Bushbuckridge.
7. In the participatory process the term emerging farmers was used to describe historically disadvantaged farmers that are trying to become established as commercial farmers. Some emerging farmers disliked this label as it presumed that they were not farmers, dismissing them as subsistence or dry-land farmers. In this paper the term emerging commercial farmers will be used to describe this sector.
8. Water User Associations will operate at the local level and are essentially associations of individual users who wish to undertake water-related activities for their mutual benefit (Geldenhuys, 1997).
9. Brown and Woodhouse (2004) provide a detailed explanation of these difficulties.

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Achieving Integrated Water Resource Management: the mismatch in boundaries between water resources management and water supply

Sharon Pollard and Derick du Toit

Central to the National Water Policy of South Africa and echoed in the National Water Act (Act 36 of 1998) and Water Services Act (Act 108 of 1997) is the devolution of water management and regulation to regional authorities that take the form of Water Services Authorities and Catchment Management Agencies. Our argument is that local government has a very narrow focus of responsibility within WRM – that is, a focus specifically on water supply - and that this is not planned within the WRM framework of the catchment. We suggest that in a new policy environment that talks to sustainability planning this represents a major oversight. Moreover, this situation is exacerbated by the different boundaries within which WRM and water supply operate. We illustrate this argument through examining the situation in the Sand River catchment and the Bohlabela Municipal District and highlights key issues that should be considered in charting a way forward.

Keywords: IWRM, South Africa, Sand River, water supply

Introduction

South Africa is at a point where, after the complete revision of its water and sanitation policies that accompanied democratic transformation, attention has turned to implementation. The new policies and associated legislation are not only about ensuring adequate quality and quantity of water for human need, they are also about protecting the resources available for current and future use so that the national slogan of *'some, for all, forever'* can be realized. In a fundamental departure from previous approaches to water resource management, catchments are seen as the units for integrated water resources management (IWRM).

Another key development is the specific requirement to include local stakeholders in WRM. In its broadest sense this is to be undertaken by Catchment Management Agencies (CMA) which are tasked with the management of water resources at the scale of Water Management Areas or WMA. South Africa has been divided into 19 water management areas, each comprising a number of catchments. It is incumbent on the CMA to consider the sustainability of both the resource base as well as water delivery mechanisms. Theoretically, the CMA's will be informed by local-level representation through Catchment Fora and/ or Committees, Water User Associations, Water Services Authorities and Water Service Providers. Local governance structures in the form of district and local municipalities are expected to participate in the water management and supply side as Water Service Authorities and Water Service Providers.

The management of water resources falls within the remit of the National Water Act (NWA, 1998) and is specific to catchments (natural boundaries) within water management areas. Water services provision, on the other hand, is largely the domain of the Water Services Act (WSA, 1997) and is mainly grounded in the provision of water services within municipal (administrative) boundaries.

This paper raises potential disjunctures that are emerging between water resources management and water services provision. We focus specifically on the role and planning frameworks of Local Government and the CMA, although many of the comments pertain equally to other stakeholder groups such as agriculture and industry. In the paper we seek to elaborate the situation by drawing on our experience in the Sand River Catchment and Bohlabela District (Figure 1), and by considering the implications that the various legislative and planning instruments might have for the implementation of IWRM at a local level as outlined by the National Water Policy (1997). We then go on to examine the implications that various policy and planning frameworks as well as different spatial (catchment, traditional authority and local government) boundaries might hold for IWRM. It is pertinent to provide with a brief description of the policy environment and the

imperative for democratic decentralization as supported by the National Constitution of South Africa (Act 108 of 1996).

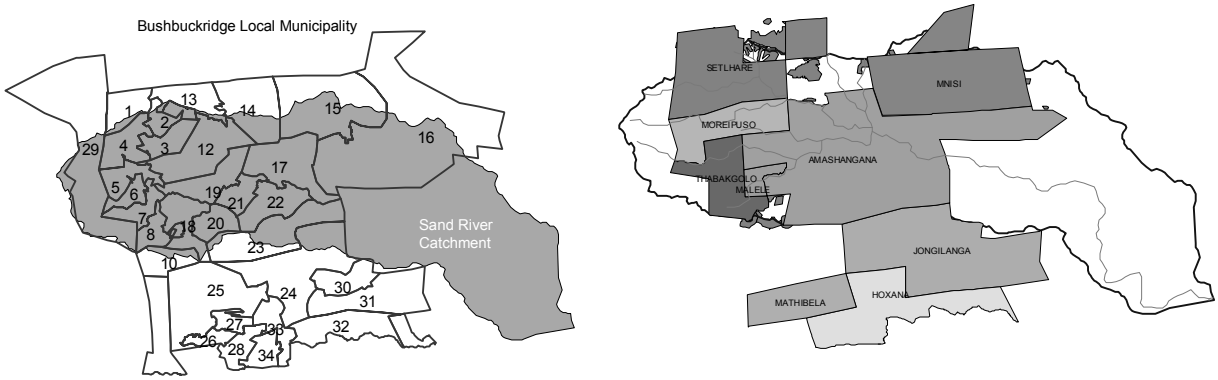

Figure 1. Map showing the various spatial boundaries that are used for water resources governance within and around the Sand River Catchment.

Note: Seen through the lens of water resources management, the Sand River, a sub-catchment within the Inkomati Water Management Area, is overlain by (a) the Bushbuckridge Local Municipality boundary and (b) the traditional authority boundaries. The latter boundaries are included here because prior to 1994, traditional authorities presided over both water supply issues and some aspects of water resources governance. In the Bushbuckridge area, some of these functions (such as the management of wetland plots) are still acknowledged as a traditional authority role by local residents.

Despite the requirements of the new National Water Act (1998) to work toward *Integrated* Water Resources Management, within the wider spirit of the Act (equity and sustainability), the current focus of most water-related institutions is exclusively on supply. We suggest that the split between water resources management and water supply, both legislatively and institutionally undermines the intentions of integration. We also maintain that there is insufficient focus on the sustainability aspect of water resources management within the supply sectors.

In our context of the Sand River Catchment, District and Local governance structures are tasked, by the Water Services Act, with a very specific aspect of WRM - that of water supply – although the NWA clearly invites them to participate in the wider sphere of IWRM. Nonetheless, given the urgency to meet domestic demands and to address the backlog of the apartheid regime inequities, it is hardly surprising that little attention is currently given to the broader aspects of WRM. Even so, we would argue that the current absence of planning within the broader holistic framework provided by the NWA and more recently, the National Water Resources Strategy (2002) will work at cross-purposes to the very principles and intentions of these new policies - namely, sustainability and equity. In particular, we argue that the aim of IWRM, which includes the supply of water, is confounded by the current mismatch between administrative and natural/catchment boundaries. We also suggest that the tasks of Local Government are often conflated with those of wider stakeholder platforms specifically constituted for IWRM- the catchment management fora/ committees and ultimately the CMA. Without a clear initiative to align and reconcile these conflations and mismatches, it is likely that the scenario of 'planning in a vacuum' will continue. This implies that water management and water supply will remain delinked.

Background: policy and legislative environment

Policy and acts

The national water policy (1997) sets out a framework for the management of water and provision of water services and forms the basis for the derivation of the two main laws: the National Water Act (1998) and the Water Services Act (1997). The approach adopted by the water policy can be summarized in the slogan: "*some,*

for all, for ever", and captures the Constitutional obligation to provide access to "*sufficient food and water to meet basic human needs*" as a human right ("*some, for all*"). Additionally, the water policy recognizes the need to plan for sustainable management of water to ensure adequate water for present and future generations ("*forever*"). The "*some, for all, forever*" slogan is then articulated in the two legislative instruments and then translated into implementation plans and strategies at national, provincial and local levels.

The NWA, albeit far reaching in the changes that it heralds for water resource management in South Africa, is a framework act, leaving much of the detail as to how it will be implemented to regulators and operators to define within a local context. However, the Act commits us to the ideal of Integrated Catchment Management and recognizes the context for WRM as the catchment.

The provision of water services, on the other hand, takes its context from the administrative boundaries of District and Local Municipalities. The WSA details issues of water supply and sanitation and lays out some of the institutions associated with the water services provision such as water boards and water services providers.

Integrated catchment management

Integrated catchment management (ICM) can be seen as a critique of the fragmented approach to managing water resources, rivers and the terrestrial activities that affect them. It is an approach underwritten by principles of sustainability planning. Fragmentation has typically been both sectoral and geographical. Sectoral fragmentation is sometimes referred to as the "silo" effect, where each set of activities is managed within the narrow scope of agriculture, forestry, irrigation, and so on. Geographical fragmentation has resulted in part from the lack of correspondence between administrative and natural boundaries. The rationale is that the catchment provides a natural framework within which to undertake integrated water resources planning and management. Adopting this orientation means that water cannot, and should not, be viewed or managed simply at the point of extraction or impact, but rather needs to be seen as a key linkage within a catchment system.

For the very reason that ICM has emerged by way of critique, it faces many challenges, which can be seen through key tensions (Hirsch and Pollard in prep). There are tensions between establishing models, or best practice approaches, on the one hand, and adaptation to context (ecological, political, developmental/economic, and social/cultural) on the other. There are questions about the significance of scale in determining what can and what cannot work. There are tensions between emphasis on form and emphasis on process in catchment management. There are tensions between more centralized/coordinated catchment governance, and more participatory, decentralized approaches. There is a tension between catchment thinking and other narrower orientations to issues such as meeting the backlog of water supply demands. This paper seeks to address the tensions that emerge from the mismatches between natural catchment boundaries associated with ICM and administrative boundaries linked to water services and supply.

Institutional arrangements for water resources management and supply

An overview of the proposed governance structures for water resource management and supply in the Sand River Catchment is given in Figure 2. Water resource management is governed largely by the National Water Act (1998) whilst water supply is governed principally by the Water Service Act (1997). Although still in the early stages of implementation, water supply governance is more advanced than water resources management.

In the case of water resource management, a CMA operates in one of the 19 water management areas of South Africa. Thus, sub-catchments within these are represented by catchment management fora, comprising representatives of stakeholder fora or water user associations. These fora will, in effect, make representations to the CMA for sectoral water allocations, including water demands for rural communities. The Sand River Catchment forms part of the Inkomati water management area which will be governed by a CMA, although this is not yet operative.

Our district municipality represents the water services authority that functions to 'allocate' water to the local municipalities, who act as the water service providers. The ward councillors will, in effect, make representations to the local municipalities regarding water demands for their villages of jurisdiction and communicate water supply constraints. They rely heavily therefore, on inputs from the village water committees. Local municipalities articulate these needs through their water services development plans

(WSDPs). The Sand River Catchment falls under the remit of the Bohlabela district municipality and specifically the Bushbuckridge local municipality.

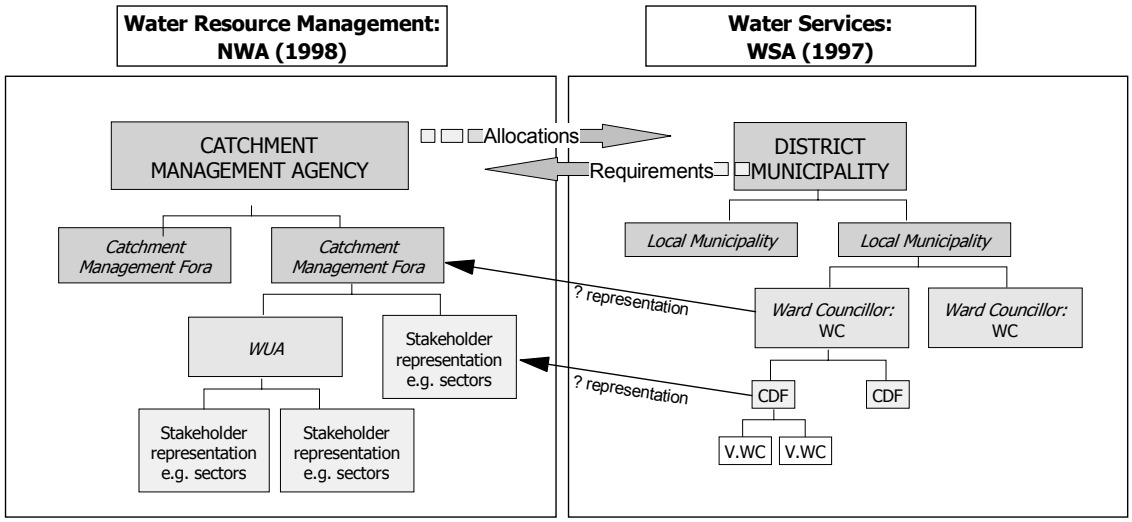

Figure 2: Overview of the proposed institutional arrangements for water resource management and supply in the Sand River Catchment

Note: The details of these institutional arrangements may vary in different regions of South Africa. This figure indicates that water supply issues should relate to wider catchment management issues in terms of water allocations and through representation. Abbreviations: V.WC = village water committee; CDF = community development forum representing multiple village-based committees; WC = ward committee comprising CDFs from a number of villages.

Devolution of water governance responsibilities

In seeking to bring coherence and integration to water resources management and at the same time address the issues of equity and sustainability, South Africa has embarked upon a process of decentralisation of management and regulation. The imperatives for public participation and stakeholder inclusion as required by decentralisation are expressed in the Constitution and articulated in both the NWA and WSA. In the water sector the process is given meaning through the development of various institutional arrangements represented by Figure 2 and explained in the previous section. These institutional arrangements are associated with the current democratic government but traditional governance and customary law continue to be important in terms of community issues, land allocation, conflict resolution and so on. Traditional governance structures include chiefs, *indunas* and advisors that provide an additional form of decision making and regulation in parts of the Sand River Catchment under communal land tenure. The devolution of decision making to a local level will need to occur within the context of institutional complexity demanding clear lines of communication between the various governance structures.

Although the devolution of decision making to a local/regional level has been welcomed, it represents a very new concept in water management in South Africa and can therefore be largely regarded as emerging practice. How WRM can be reconciled within a complex governance and decision- making environment still needs to be explored.

Part of the challenge is having to deal with institutional complexity superimposed upon mismatched boundaries associated with management and supply. Our experience indicates that there is a general lack of clarity and understanding of a) the need to manage water resources on the basis of a catchment, and b) the imperative to supply water within administrative boundaries of municipal district. Although the confusion is largely between water management and supply as devolved to catchment management and water services authorities respectively, it is worth noting that it is unclear how common-property governance regimes, such as over the use of a wetland or a spring for example, will be incorporated into the new decentralised model.

Mismatch between management and delivery boundaries: the case of the Sand River Catchment

The following case study will explore the aspects of WRM in the Sand River catchment by examine both the status of water resources from a catchment perspective, and the needs of the domestic sector as articulated in the water services development plans.

Table 1. Summary of the water resources availability and demands within the Sand River catchment (from Moriarty et al. 2004)

Description		Resource	Infrastructure	Demand/ Entitlement
Surface-water availability	Median	75,200,000		
	Lower quartile	48,830,000		
Ground-water	DWAF est.	8,000,000		
	2%recharge	30,902,127		
	5%recharge	77,255,319		
	10%recharge	154,510,637		
ER	IFR 50% probability of exceedance		*38,620,800*	*38,620,800*
BHNR/RDP	25 lpcd			2,466,907
Domestic	100lpcd			9,867,629
	Bulk (drawn from the Sand)		6,329,100	
	Bulk (supplied to Sand communities)		5,901,533	
	Groundwater		5,110,000	
Agriculture	AWARD		*22,286,129*	22,286,129
	DWAF		*12,170,000*	12,170,000
Forestry	DWAF		*4,888,415*	4,888,415
	AWARD		*6,755,706*	6,755,706
Total (no transfer)	Median	75,200,000	64,060,806	62,489,335
	Lower quartile	48,830,000		

The Sand River catchment is a sub-catchment of the Sabie and together, they fall within the Inkomati WMA. Catalyzed by intense water resource constraints and the crippling drought of 1992, government and other stakeholders supported the development of a catchment management plan for the Sand sub-catchment to mitigate the problems of water resource constraints and associated land-uses (see Pollard et al. 1998; Pollard 2002). The governing principles for the plan reflected the intentions of the NWA and focused principally on

sustainability, equity and rehabilitation. The intention of the plan was to address the rehabilitation and sustainability of the Sand River Catchment. The implementation of various measures is being undertaken by a range of partners under the banner of the Save the Sand Project (or SSP) which is co-ordinated by AWARD, a locally-based NGO.

Since the development of the plan, various studies have also been undertaken to address shortfalls in information, or to test policy implementation. Two of these are pertinent to this discussion. One of these known as the WHiRL study, has developed an improved understanding regarding water security for the Reserve and for small-scale productive use in the Sand River (Moriarty et al 2004; Pollard et al. 2004). Earlier studies established that the catchment faced severe water shortage constraints (Chunnett, Fourie & Partners, 1990), Pollard et al. 1998) but were confounded by the lack of realistic estimates of water usage by each sector – mainly because no monitoring devices existed. Part of the study involved the development of an tool known as RIDe (Resources, Infrastructure, Demand and entitlements) for assessing catchment water resources and for modeling various water-demand scenarios (Moriarty et al, 2004). This study very clearly indicated that the Sand River Catchment is closed (Table 1). At most times of the year the requirements for the Ecological Reserve are flouted and the minimum domestic requirement (the Basic Human Needs Reserve - BHNR) can only be met if additional water is transferred from the neighbouring Sabie catchment together with the development of additional distributional infrastructure and/or localized groundwater supplies are exploited.

A second, and key programme of the SSP has been that of public awareness raising. In this case efforts have focused principally on developing the capacity of local-level stakeholders in terms of the new legislation. A major focus of the effort has been on assisting local government to play a stronger and more informed role in WRM issues in the catchment. Part of the process has been to raise awareness of the need to incorporate sound water management principles, including those of efficient, equitable, affordable and sustainable water supply into the planning instruments such as the Integrated Development Plans (IDPs) and the Water Services Development Plan (WSDP) for the Bushbuckridge Local Municipality (BLM, 2003). It is important to note that the current WSDPs are the first of their kind and are likely to undergo changes as learnings are brought to bear. Nonetheless, as they currently exist, they point to some important issues that need to be considered within the broader intentions of IWRM. The IDP vision talks quite clearly to the service delivery function although the sustainability of natural resources are implied: "All human beings living in the Bohlabela District Municipality must enjoy an interactive, transparent, self-sustainable environment and have access to efficient service delivery". The priority issues which impact on water resources include economic development, water supply, health services and environmental management (which is interpreted simply as a reduction in environmental pollution – arguably a minor issue in the catchment in relation to other environmental issues such as declining water security). These priority issues are followed by sub-goals focused on water services and integrated water resource management (Table 2) and institutional arrangements.

Table 2. The sub-goals of the Bohlabela District Municipality water services development plans that relate to water services and to Integrated Water Resource Management.

Sustainable water services sub-goals	Details
Provision of basic water services (includes free basic water)	Provide access to free basic water to all by 2008
Provision of basic sanitation services	Ensure that all communities have access to basic sanitation by 2010
Higher levels of water services	Higher levels will be demand driven as and when the customers can afford the service levels
	Higher levels will be demand driven where it does not exist yet and existing services must lead to cost recovery by 2007
Higher levels of sanitation services	Provide access to free basic water to all by 2008

Integrated water resource management sub-goals	Details
Water resource protection	Support the Kruger to Canyons initiative, which will protect the Blyde major source.
	Promote cross border co-operation with EDM to ensure protection of the Sabie/ Sand source
	Improve sanitation to protect groundwater.
Water resource conservation	The Kruger to Canyons project will promote conservation of the Blyde source
	Promote better forest management
Demand management	Control demand by installing water meters.
	Reduce illegal connections
	Promote household water waste reduction

Note: As suggested in the paper, the latter sub-goals reflect neither the catchment orientation to WRM that is required in the Act nor realistic activities linked to each of the sub-goals (BLM, 2003).

An examination of water resource protection sub-goals points to a somewhat disparate set of loosely-affiliated institutions that do not hold – as their main objective - IWRM. Reference is made to the Blyde River as a key water resource, despite the fact that the main water resource for the Bushbuckridge area – the Sand River- receives only cursory mention. Moreover, its protection is vaguely assigned to the Ehlanzeni District Municipality which, in any event, would not be responsible for its protection. These sub-goals clearly demonstrate the level of confusion of roles, issues of subsidiarity in terms of the IWRM functions, and the conflation of functions that contribute to the broad umbrella of IWRM.

Given the highly precarious water resources situation in the Sand River Catchment, it would seem prudent to ensure close collaboration and integration between water resources management –aimed at achieving longterm sustainability- and water supply, aimed at redressing past inequities but not at the expense of achieving not only in the shorterm.

This case study highlights a number of disparities that are apparent within the 'water sector'.
The governance structures of water resource management and water supply operate at different spatial scales (catchments and districts) and their boundaries are not concordant. Thus, the WSDPs can draw on water services delivery from a number of catchments whilst the CMA manages water on a catchment basis. Water service development plans need to be formulated within the context of water resource management principles and vice versa. And yet, the WSDPs have already been developed - effectively in a water resource management vacuum. Understandably, the pressing need to meet the water demands of the rural poor have outweighed the lengthy process of water resource management in the country but these plans may be confounded by the allocation plans of the CMA once these come on track.

Implications of a mismatch in water governance responsibilities

The BHNR is a statutory requirement and is not subject to the limitations of resource constraints (Pejan, 2004). In cases where a municipality straddles more than one catchment, the quantification of the BHNR will be based on population figures of the entire district whereas the CMA's obligation for allocation is to the population within the catchment boundary. This will place responsibilities on Water Management Institutions (WMI's) to recognise this mismatch and to compensate through additional collaboration, planning and monitoring and communicating procedures. Additionally, this has implications for the monitoring of infringements of the BHNR. It is not hard to envisage a similar issue arising with regard to the Ecological Reserve. For example, the current population of the BDM is estimated as 774,000 whilst that of the SRC is 420,000. Practically, the BDM cannot request water for the total figure from the Inkomati CMA. It would need to disaggregate these figures according catchment boundaries. If this is used to calculate water required over and above that to meet the BHNR minimum (25 l) the implications for the water resources and infrastructural planning could be

considerable. In our experience, the current first-generation IDPs have been developed with the support of consultants who themselves appear to be unaware of the requirement for better integration.

In our case, the first WSDPs produced by local government, through public consultation, can be regarded as 'wish-lists' because, amongst other reasons, they are not grounded in a broader water-resource reality of the catchment. They are thus seen as untenable. Nonetheless, it must be recognised that not only do they represent the first attempts to articulate water supply needs, but also that they have been developed in the face of capacity limitations and in a CMA-vacuum. If, however, this situation is not remedied so that broader WRM principles are reflected in future planning, the local government submission for water allocations is likely to be regarded as weak, especially for water required over-and-above the statutory requirements. Ultimately, the real need of the rural poor for access to water is likely to be undermined. If, however, local governments are supported to adopt holistic planning in the development of their own submissions they will be much better placed to negotiate support for their requests in a multiple-stakeholder environment such as the CMA, where each will have to not only justify their request but consider those of others (i.e. consensus-driven). This argument applies equally to other sectors, such as commercial agriculture, that may make its demands through a WUA.

The current mismatch in water supply and management boundaries also carries over into language and practice, reflected by the different ways that the concept of management is applied. Water supply and sustainable water resources planning are not likely to be reconciled in an environment where the concept of management and its application are not clarified. Divergent discourses around management for purposes of supply versus management for holistic and sustainability purposes are likely to hamper the attainment of holistic water resource management goals. What we are suggesting is that parameters for common practice need to be established using the overarching goals of the NWA as a point of departure (Box 1).

Box 1. Seven goals for WRM (NWA, 1998)

1. Sufficient water for Basic Human Needs Reserve
2. Sufficient water for the Ecological Reserve
3. Equal access for all
4. Water is not wasted and is used efficiently
5. Sufficient water for future demands and healthy economy and prosperous society
6. Users pay their fair share of water-use and that there is equity in payment
7. Honouring our obligations to our neighbours

Also clearing up of language and conceptual confusion is likely to support and promote co-operative governance and resource-use planning as called for by the IDP and WSDP. Current confusions hamper communication as different stakeholders do not clearly understand each others' perceptions, parameters and practices.

Attention to clarity is particularly pertinent in the case of closed catchments, such as the SRC where currently, planning goes ahead without due recognition for resource constraints. Because plans don't have to reference themselves against the realities of limited resources and the need to uphold the Reserve and the needs of others, they assume even if implicitly, that water resources are unlimited.

Achieving synergy – an opportunity lost?

The National Water Policy outlines the intention of National Government to deliver water services within a circumscribed set of 28 principles and forms the basis for the derivation of the two water laws (WSA and NWA). The intention is for the laws to work in tandem in order to meet with the Constitutional ideals of meeting basic food and water rights, in order to eradicate poverty and redress the inequalities of the past (Von Koppen, 2002). However, as suggested above, the practice derived from the two legal instruments does not necessarily emerge in a harmonious way. The intentions of WRM as expressed by the NWA and the WSA regarding roles and responsibilities for CMAs and local government are different. For example, the point of departure for a CMA is to understand and quantify water availability, whilst that of local government is to articulate the needs of consumers. Moreover, the WSA and NWA interpret the concept somewhat differently.

In many aspects it can be argued that by following a route that adopts different physical boundaries for different aspects of water resources governance, an important opportunity and facility for achieving synergy has been lost. A focus on administrative boundaries permits management procedures to short circuit the sustainability planning demanded by the NWA. Arguably, planning on the basis of supply alone is insufficiently rigorous in that it does not allow for checking over-allocation and over-exploitation. Moreover, planning instruments could - without sound management - exacerbate the divide. The instruments at hand (i.e. the Catchment Management Strategy and the Water Services Development Plans) are not necessarily in harmony with each other because one focuses on sustainability planning for a catchment while the other focuses on meeting the needs of domestic water supply. In addition to this, other sectors are responsible for articulating their own needs to the CMA outside of the WSDP.

Thus the question arises - how will the different levels of government work towards these ideals given the current complexity of structures and boundaries (that might either hamper or facilitate processes)?

Confusing channels for participatory practices

The introduction of a participatory orientation to water management heralds a significant departure from previous approaches and opens the door for a more holistic coordination of water demands as expressed at a local level. Despite the clear expression of democratic imperatives for public participation and stakeholder inclusion in the Constitution and their articulation in both the NWA and WSA, there is considerable ambiguity as to how this will take shape within either WMA's or Municipal District boundaries.

Currently great uncertainly prevails - should civil society participate in water related issues through political structures, as outlined in the Municipal Systems Act (2000), or through specially designed catchment-based structures outlined by the NWA(1998)? Clearly the mismatch between administrative boundaries and catchment boundaries will have a significant impact on how the public and stakeholders will be able to engage with WRM in general.

We have witnessed considerable confusion in the SRC where people are unclear as to where and how they should participate, firstly, to address their specific water supply and sanitation needs and, secondly to deal with water management issues (licensing, allocation, etc.) The mismatch in catchment and administrative boundaries clearly has a confounding effect on participatory practices. Where a catchment straddles municipal boundaries a situation may arise where a village might be required to participate in water supply channels that are entirely different to the channels for water management issues. Much still needs to be done to clarify participatory practices against the backdrop of water management and supply boundary mismatches. These issues are taken up in a separate paper (Du Toit and Pollard, in prep).

Solutions and opportunities for reconciling the mismatches

Attention is required in cases where District Municipalities straddle WMA's. The domestic demand (and potentially other demands) may actually represent demands beyond the catchment boundary. Not only should Local Government be aware of these WRM boundaries but lines of communication need to be established between neighbouring CMAs'. Since CMAs are being phased in sequentially there exists the potential for leaving gaps – unless of course the Department of Water Affairs and Forestry takes a proactive role. However, regional offices are severely under capacitated and national government has prioritised the roles of policy development and regulator for itself. Which institution then will play a co-ordinating role? Even once CMAs and CMC are operative, they will require considerable awareness raising and skills development programmes to support the realisation of integrated approach. In a very nuanced arena skills development programmes often fail to capture a holistic orientation.

Concluding comments

Although the attempts of National government to provide enabling water policies and legislation are laudable they are not enough to set South Africa on a path to more sustainable water resource management. The enormous backlogs associated with water sanitation and supply are indeed a pressing concern but then so is the sustainable management of national water resources that are clearly overstretched (15 of the 19 WMA's

experience water demands that exceed or equal what is available). Clearly poor or non-existent management practices can no longer be entertained by a water sector that is increasingly having to face water deficit problems. Planning around supply cannot proceed without attention to issues of availability and management - yet the possibility exists within the water sector for such a situation to prevail.

Despite progressive legislation and a focus of efforts on a multidimensional approach that has demanded massive transformation (reviewing of water pricing, replacing inefficient water technologies, raising public awareness, a focus on integrated catchment management) much still needs to be done to facilitate governance and communication. We have attempted to show in this paper that this remains a considerable challenge given the separate legal instruments and the complexity of boundaries and borders associated with water management and supply. We maintain that there is a long road ahead before the transformatory ideals of the water sector can be met.

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Economic-legal ideology and water management in Zimbabwe: Implications for smallholder agriculture

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With an estimated 70% of the 11.6 million Zimbabweans living in impoverished rural areas, and dependent on smallholder agriculture for their livelihoods, it follows that improvements in this sub-sector can contribute to poverty alleviation, particularly food insecurity. This depends on appropriate water management in such a semi-arid climate, making the case for appropriate legal regimes in the water sector self-evident. The paper analyses the constraints that are being encountered in this area by drawing some lessons from the colonial era. The colonial state was more successful because it provided the complementary resources for its white hydraulic mission. The failure of the post-colonial state to deliver a black hydraulic mission can be understood in the same terms – the failure to enunciate and pursue an economic ideology that provided for the development of sustainable smallholder agriculture. One of the main reasons was that the post-colonial state did not capitalize on indigenous and water management experiences, which was ironic given that the leaders professed indigenous roots. This is reflected by the absence of these important experiences in policy discourse. This has rendered the legal reforms in the water sector somewhat cosmetic.

Keywords: smallholder agriculture, water management, economic-legal ideology, Zimbabwe, colonial state, post-colonial state

Introduction

With an estimated 70% of the 11.6 million Zimbabweans living in impoverished rural areas (CSO, 2002), and dependent by and large on smallholder agriculture for their livelihoods, it follows that improvements in this sub-sector can lift a significant proportion of the country's population out of poverty. In this regard the "fast track" land reform programme (in which the majority of white-owned commercial farmland was acquired for resettlement) that the Government embarked upon in 2000, potentially provided an important means with which to address the worsening poverty. It is claimed that some 12 million hectares were acquired. By August 2003 slightly over 130 000-farming households were resettled (Utete, 2003) adding to the existing 1 000 000 and 60 000 households in the communal and old resettlement areas respectively (Muir, 1994). However, these figures are not indications of a success story as increasing food insecurity remains a poignant illustration of the worsening poverty. For example between 1995 and 2002 the proportion of people living below the Food Poverty Line (FPL) was estimated to have risen to 69% from 57 (ZHDR, 2003).

A discussion of access to land alone, without extending it to water, in such a semi-arid environment does not bode well for an informed analysis of the agrarian question in general or an understanding of how sustainable smallholder agricultural production can be structured (Cleaver, 1995). Ideally both land and water accessibility should be addressed simultaneously as these two resources complement each other in agricultural production (Manzungu, 2001). In this regard appropriate land and water legal arrangements are important (since all human interactions are mediated through one form of legal framework or another) especially to protect the interests of the less powerful members of the society, such as smallholder farmers. But a quick caveat needs to be added. Successful agricultural production also depends on other factors such as access to agricultural markets, affordable finance, appropriate technologies, adequate transport network, to mention but a few. This observation constitutes the point of departure for the argument we wish to make in this paper – productive water use by smallholder farmers in Zimbabwe cannot be achieved by merely changing the water legislation. This has already been illustrated by the fact that changes in water legislation in the post-colonial era failed to elicit the much-needed increase in productive water use in the smallholder sector. A case in point is the 10% of water in government dams reserved for smallholder farmers, which has remained unutilized (IFAD, 1997).

From available evidence it would appear that sustainable productive water use in the smallholder agricultural sector in Zimbabwe, in both the short and long term, is not assured. This paper attempts to explain why. The argument being made here is not that changing water legislation does not lead to productive water use by smallholder farmers. Rather the argument is that changes in the water law are likely to succeed if they are underpinned by a sound economic ideology, referring to economic fundamental ideals/values that are popularized and translated into practice throughout society. This will provide a sound platform for appropriate water-related policies. But it is also important to ensure that there is supportive legislation in place. It may therefore be appropriate to speak in terms of an economic-legal ideology as a precondition for productive water use in smallholder agriculture.

In this paper ideology is not used in its pejorative sense of false consciousness but is understood as a critical driver and explanator of social action (Taras, 1984). Ideology incorporates legal, political, religious, artistic and philosophical values, all encapsulated in a 'set of norms'. It has also been referred to as a 'philosophy', 'spirit of the age', a 'political programme', 'form of social consciousness' or a 'political theory' that legitimizes a particular type of social action. Apart from political connotations, ideology also has economic connotations. This is because it is a product of economic relations of a given epoch that may continue to exist after these relations have become outmoded or replaced, and may exert a considerable influence on future social development (Taras, 1984: 4). Seen in this light ideological differences are not necessarily about proving the validity of any one ideology *per se*, but about achieving a desired social effect with economic issues/interests playing a central role. Ideology performs a critical social function in that it makes it possible for society to better perform the necessary roles and functions. Without ideology society lacks an influential regulatory mechanism and motivating force (Taras, 1984).

This paper applies this line of thinking to water management practice in Zimbabwe in relation to how it can best contribute to smallholder agriculture upon which many livelihoods depend. Both the colonial and post-colonial periods are analysed with a view to finding an explanation for some of the current realities. The paper draws upon a number of published sources to make the argument. Three aspects are singled out for analysis, namely water resource management, irrigation development and soil-water conservation (important for rainfed agriculture and catchment management). These are important aspects of integrated water resource management (IWRM). IWRM offers best prospects for sustainable water management. Both irrigated and rainfed farming are critical in improving the country's agricultural fortunes and not just irrigation as is often believed. It is worth remembering that at best only half a million of the 30 million hectares classified as agricultural land can be irrigated due to water unavailability.

Colonial era

Creating white agriculture

The founding economic ideology of the colonial state that began in 1890 and ended in 1980 can be summarized as constructing a white settler economy on the back of a black working class/peasantry. The political and social agenda of the colonial state reflected this fact. In the early settlement years the British South African Company (BSAC), under whose administration the country fell until 1923 when the colony was accorded semi-independence in the form of responsible government, concentrated on finding the 'second Rand' with a view to expand gold mining activities it had started in South Africa. During this time land appropriation was for mining interests and not for agriculture. Settlers then depended on agricultural produce grown by indigenous people (ZCTU, 1996).

The fact that no gold was found, as well as subsequent depreciation of the Company's shares on the London Stock Exchange, forced the Company to revise its economic policy. A new policy based on export agriculture was inaugurated in 1907. This resulted in land appropriation at the expense of the black indigenous population. The British Government was caught between catering for the interests of the white settlers and that of the black majority. For example in 1898 it evoked an Order in Council that created Native Reserves on lands deemed unsuitable for white settlers. By 1910 23.4% of the land had been appropriated by white settlers while 26% had been declared Native Reserves (Herbst, 1990). The reserved land was generally of inferior agricultural quality in terms of inherent fertility and moisture availability. The Native Reserves Commission of 1914 resulted in a

white settler-induced appropriation of the better part of the Reserves. The Land Apportionment Act of 1930 legalized racial segregation of land. By this time 50.8% of the total land had been declared 'European' compared to 30% for the African population. Land for blacks was held under a 'traditional' tenure system according to the perceptions of settlers. Under this system only user-rights could be enjoyed. White settlers were accorded full rights to the land they were allocated.

The rise of Black Nationalism forced some cosmetic revision of the land appropriation. For example amendments were made so as to increase the amount of land for blacks by expanding Special Native Reserves and creating non-racial land, which was termed 'unreserved land' by white liberals. This move drew fire from some white conservatives. The ideological differences among the settlers developed into an open political schism. A white conservative party, the Rhodesia Front Party, later headed by Ian Douglas Smith, was voted into power in the mid 1960s on the basis of a white conservative land agenda. The government restored the Land Apportionment Act and froze the unreserved category of land. In 1965 Smith declared a Unilateral Declaration of Independence (UDI), which resulted in sanctions being imposed by the United Nations. The Smith government represented the antithesis of prosperous black agriculture:

> It had an absolutely clear policy of forcing people to grow just enough to be malnourished and prevented them from doing anything more ... By the mid 1970s white agriculture was supplying the Tribal Trust Lands (TTLs) with a substantial proportion of food staples. Therefore the state had almost completely reversed the agricultural supply situation at the beginning of the century when white settlers were dependent on Africans for food supplies (Herbst, 1990: 27).

Apart from land appropriation other measures were put in place in support of white agriculture. There were for example interventions to aggressively promote marketing of white-produced agricultural produce. The Maize Control Act of 1930, which established the Maize Control Board, forced African maize growers to subsidise white farmers. The latter got prices 40% higher than the world market prices while the former got the local market price. In 1931 the Cattle Levy Act imposed a levy on the slaughter of cattle for domestic consumption in order to subsidise white cattle exports. Marketing Boards were also established for tobacco, cotton, beef, pigs and milk with the express aim of supporting white agriculture. Such support to white agriculture was typical throughout the colonial period.

In 1912 the Land Bank was created to enable white immigrants to settle as farmers. In 1935, following the Great Depression, the Farmers Debt Adjustment Act was passed. This abolished interest charges on farm purchases, and deferred loan repayments for three years for white farmers. To counter the UDI-related sanctions the Agricultural Assistance Committee was set up in 1966 for the purpose of extending short-term loans to farmers to cover the cost of inputs, living expenses and hire-purchase commitments. Farmers were also paid a subsidy on nitrogenous fertilizers and diesel fuel. The Farm Irrigation Fund, launched in 1966, extended soft loans to white farmers for head-works, in-field development and purchasing of irrigation equipment. There was a 50% subsidy and free technical support programme allowing white farmers to build soil and water conservation works. In 1971 the Agricultural Finance Authority was launched to extend more credit to white farmers. In addition to the above white commercial farming areas were also well serviced with good infrastructure in the form of road and railway networks.

Research and extension institutions were also set up to support white agriculture. For example in 1908 the Department of Agriculture was created to implement the White Agricultural Policy that had been launched in 1907. The Department of Research and Specialist Services was set up in 1948 to institutionalize agricultural research in the country as a vehicle to increase crop yields and intensify agricultural production in general. In 1950 the Department of Conservation and Extension was established. The Grain Marketing Act was passed in 1950 and led to the establishment of the Grain Marketing Board. The Salisbury and Gwebi Research Stations were set up in 1909 while Rhodes Inyanga and Matopos Estates were acquired for research in 1917. The Agricultural Research Council was set up in 1970 in order to direct research efforts in close coordination with representatives of white farmers.

A small window for indigenous agriculture

There were limited rights in the Native Reserves set aside for the indigenous population. For example, they did not own the land as this was held in trust for them. There was a limit to the size of land on which an individual was allowed to cultivate. The main idea was to facilitate production for household consumption and not surplus for sale. This way the black population would be compelled to work for settlers.

Some cosmetic concessions were made. Between 1930 and 1944, native areas were created to allow natives to purchase and own land privately as was happening with the settlers. This was done because there arose an elitist class of natives, which was agitating for land ownership. There was, however, a prohibition on natives owning land in the 'white' areas following the Land Apportionment Act. Over-population in the Reserves and the consequent lack of economic opportunities for peasant farmers and falling agricultural productivity turned the TTLs into excellent labour reserves for the white economy. As a consequence the country was said to be enjoying the cheapest black labour in the whole of the British Empire (Herbst, 1990). Settlers also trained locals so that they could be a more effective labour force. For example settlers instituted a programme of 'industrialising' the Native Reserves focusing on home crafts through the Department of Native Development. This was achieved through the auspices of the Southern Rhodesia Native Affairs Committee whose objective was to reduce competition between the natives and the settlers in agricultural production. The fear was that settlers, lacking background in farming, could not compete with natives.

The need for ensuring food security in the Native Reserves necessitated a move towards agricultural development of the reserves. This way the colonial government would not have to invest in providing food for the native population. The Chinamora Industrial Farm was started to train the blacks in better agricultural practices. In the same year a research support programme for smallholders was also started. Black smallholder agriculture, however, underwent fundamental changes with the appointment in 1926 of Emery Alvord as an agriculturalist for the instruction of natives. His mandate was to develop native reserves so as to enable them to carry a larger population following the removal of more blacks from the 'white' areas. Agricultural practices of the natives, such as shifting cultivation, which was considered a wasteful, destructive practice that caused soil erosion, were abolished. Alvord started the concept of training in better methods of farming. However the training did not change the agricultural fortunes of the blacks because of limited access to land and other complementary resources. As highlighted above and as will be expanded later, black agriculture has not really recovered because the post-colonial state has not managed to reverse the trend due to a lack of a strong ideology backed by appropriate laws and policies.

Water legislation

The early years: 1890-1927

As can be expected, in the early years the preoccupation with mining resulted in a situation where water was committed to mining. The later change to agriculture was explained earlier. Varying concepts of water law were tried. For example in the allocation of water rights a frontier mentality was displayed with such claims as '… being a new country, Southern Rhodesia is unhampered by the pernicious common law relating to riparian ownership'. In this way the water rights of the indigenous population, which predated the settler claims were disregarded (Manzungu and Senzanje, 1996).

Conflicts over water did not take long to develop. The frequent and often costly litigations between rival claimants to the use of water culminated in the Union Irrigation Act of 1912. This made provisions for the control, apportionment and use of water. The Act was based on the common law as evolved and expounded by the Courts (McIlwain, 1936). In 1913, the Water Ordinance was passed as a way of comprehensively dealing with problems of rights to water (ibid).

The South African connection had a strong influence on some aspects of water management. For example the settlers, encouraged by the British South Africa Company (BSAC) used the Roman Dutch Law that had been brought from Holland and then in use in South Africa. This was regarded as unsuited to the water resources and production of the region (McIlwain, 1936). There was, however, continued use of the riparian rights doctrine in interpreting access rights and differentiated water use types. The 1920 Water Ordinance explained that:

> 'if a farmer has land well suited for irrigation and there is a stream that can be economically utilised, he can acquire the right to use the whole of the water for irrigation even though it may leave others without water except for primary purposes'.

The granting of responsible government in 1923, however, did not result in complete dissociation from the principles of the Roman Dutch Law. The riparian doctrine remained on the statutes until 1998 albeit with some modifications. What needs to be pointed out is that although there were disagreements between the settlers over which was the better legal ideology to guide water allocation, the situation was worse for indigenous people. Land appropriation disadvantaged them in that they were downstream of white settlers and were generally no longer riparian to perennial rivers; the whole legal system was against them and this was compounded by a shortage of the necessary finance.

Another concept that was reflected in the water law was primary water use. This was water for human and farm livestock use and was set at 50 gallons (~228litres) per person per day. This was quite generous moreso because it could be used in and around the homestead, which did not preclude gardening. Water for 'secondary purposes' was for irrigation and watering of stock other than farm stock. 'Tertiary purposes' included the needs of the mines and railways. The water resources legal environment in the colony was marked by three major laws as discussed in the following sections.

Agriculture-based water law: 1927-1980

Table 1 shows the main changes to the water legislation during the time agriculture became a dominant water user. By the Act of 1927 the priority right to water, granted to the mining industry within the Gold Belt areas, was modified in favour of irrigation (National Archives of Zimbabwe, n.d.). Therein were a number of clauses that disadvantaged the indigenous native population. First of all water rights were attached to land, which disadvantaged the natives who had been dispossessed and placed in the reserves where they did not enjoy full rights. Rights to land in the reserves were registered with Communal Area bodies (formerly known as Tribal Trust Lands) and not with individuals. Natives could therefore only apply for water rights as a community, and through government officials. Even then the District Administrator or Minister of Water Development held the water right on the behalf of the natives. There was, however, provision for the appointment of representatives of 'native interests' in the Irrigation Boards and in the Water Courts. Not much is known about whether or not they were actually represented. Settlers on the other hand could individually apply for water rights because they owned land in their own private capacity. Another problem was that water rights were issued based on the priority date system; this meant that rights were granted on a first-come first-served basis. The Black indigenous people were disadvantaged because they had not applied for water rights (Manzungu, 2001). When they later understood this, most of the water was committed to rights held by the settlers. Water rights were also issued in perpetuity, which meant that a water right once issued could not be revoked except in special circumstances such as the declaration of a drought or when someone else applied for the same water and was willing to pay compensation. By virtue of the fact that settlers applied for the rights way before the indigenes, most of the water was committed. It should be noted that although racial water allocation was provided for in the 1927 Water Act, it was only in the 1940s that massive transfers of water to the whites actually occurred because of cheap finance. This emphasizes the argument that it is not necessarily changes in water legislation that determines (lack of) access to water.

The 1947 Water Amendment Act had loose allowances for primary water uses especially for gardens and riparian users. The Act also defined vleis (*dambos* [seasonally flooded wetlands] or wetlands in depressions), springs and streams that stayed outside public management because they were defined as 'private water'. This changed later with restrictions on *dambo* cultivation mainly because of fear of degradation, which had been noticed in the white farms. The Act also identified new water uses such as fish farms and conservation activities that were a result of new commercial interests.

Table 1. Main characteristics of water legislation between 1927 and 1980

1927 Act	1947 Act	1976 Act
• Differentiation of public and private streams • Differentiation of primary, secondary and tertiary use • Created a Water Registrar and Water Court which centralized water allocation • Required [all] people [using water] to apply for both a water right and approval of works to a Water Registrar • Set up a 'priority right' system for a drought year with applications given priority in order of time • Allowed recognition of 'combined irrigation systems' with Irrigation Boards that had certain rights and responsibilities in payments of development capital • Required registration of all dams storing over one million gallons unless for a primary right	• Declared that all water other than private water was registered with the governor • Reconfirmed that water rights were attached to land and not individuals • Private water was defined as 'that which naturally rises, falls or drains on to any land, provided such water is not naturally capable of entering any water course of natural origin' • Defined primary use as use for humans and animals and was set at 50 gallons (~228 litres) per day per person resident irrespective of colour or race, which can be used in gardens, for waterborne sewage purposes or other activities • Clarified the rights of riparian landowners: 'They have the right, without any reference to the Water Court, to impound, divert or take any public water for primary use, and this right extends to any occupier or tenant of riparian lands. They also have, otherwise than in the public interest, a prior claim over non-riparian owners to be allocated by a Water Court for irrigation or other purposes' • Redefined priority of use as, firstly, all primary rights, then rights for irrigation purposes (based on date of issue) and then tertiary rights	• Clarified and created regulations about groundwater use for the first time. No restrictions were placed on drilling except in underground or surface water control areas. • Rights to use, and permits for groundwater, were linked to land • Required dams of a certain size to be registered, and design and construction to be carried out by a registered engineer • Required a riparian landowner intending to dam a public stream to notify all riparians downstream of the dam and contiguous to the dam • Rescheduled water use types so that irrigation, fish farming and feedlots were registered as agricultural use

Source: Based on Vincent and Manzungu (In press)

The Water Act of 1976 affirmed the Roman Dutch Law concept in water management and upheld the principles of the 1927 Water Act i.e. rights to water were linked to land, the priority date system of allocating water and granting a water right in perpetuity. The Act also provided for catchment outline plans to be prepared for the development and use of surface water. Three types of water were recognised, public water, private water and underground water. The Act, under a 1984 amendment, also provided for some stakeholder participation in such institutions as River Boards. The participation was, however, restricted to water right holders. The Act also required applicants for water rights to put in place water measuring devices for a water right to be confirmed as permanent. This explains why most water rights in the native areas were temporary –the natives could not afford to put in the requisite measuring devices.

In summary it can be said that the system of water allocation in the colonial period was based on the matrix of ideas of efficiency, modernity, white power, male supremacy and the conception of starving Africans of land and water (Campbell, 2003). Campbell (2003) further argues that the planning mechanism of the settler state was organized around the concept of the scarcity of water. Politicians, agricultural extension officers, water resource managers, hydrologists, engineers, planners and economists propagated the concept of water scarcity when in reality, the problem of water availability was one of democratic distribution and not availability. This was re-enforced by the myth of white supremacy, which was backed up in law and in the allocation of resources. Commercial agriculture was considered a part of the modern sector therefore commercial farmers

were considered modern users of water, while communal agriculture was part of the subsistence and backward sector. Not much effort was made to make the black farmers aware even of the limited rights they had.

Irrigation development

Expansion in irrigation in the commercial sector was aided by the availability of low interest finance (Manzungu and Senzanje, 1996). Finance was made available for soil conservation, dam and weir construction and borehole sinking. There were also arrangements to supply cement at cheap rates and payment of rebates of up to 25% of the cost of dams and storage weirs. This system of subsidies was introduced in 1936 to encourage water conservation (Report of Secretary, Department of Agriculture and Lands, 1944: 327). Some estates also benefited from this new arrangement in the form of low interest loans and direct expenditure by the government on irrigation infrastructure (Mlambo and Pangeti, 1996). The government also contributed to road and railway networks. Essentially, public finance played a significant part in entrenching water resources in the white commercial sector.

The remainder of this section turns to developments in the black farming areas. Table 2 shows the various policy changes regarding the development of irrigation.

Table 2. Policy developments in colonial period

Period	Policy Objectives
1912 - 1927	Farmer-initiated furrow irrigation with help of missionaries. Government watches from a distance.
1928 - 1934	Government provides services and helps farmers develop irrigation schemes but farmers retain control of schemes
1935 – 1945	Government takes over management of communal irrigation schemes
1946 – 1956	Land apportionment Act of 1930 is amended and Blacks are moved to native Reserves. New irrigation schemes created to resettle Black farmers
1957 – 1965	Government curtails development of new schemes because of its cost considerations
1966 – 1980	Government policy of separate development for Blacks and Whites. Introduction of strategy of rural growth points, mostly based on irrigation.

Source: Manzungu (1999)

The changes were very much shaped by the prevailing economic ideology. After a *laissez-faire* approach to indigenous irrigation the colonial state changed tune in the aftermath of its change in policy towards agriculture. Communal irrigation was then developed for the black population as a way of accommodating more space for many of the indigenes. They were developed for various reasons; to stop competition between the white and native farmers (by increasing government control over native production), to stem rural-urban migration by natives to escape agricultural taxes, to enable better control of native activities and to ensure food security for the native population. What this did was to force native production within the settler systems of policy and legal controls. This started in earnest in the mid 1930s as described below.

From 1935 to the 1950s there was increased government control on smallholder irrigation. This resulted in increased pressure on irrigators to give up dryland farming and not leave irrigated plots, to produce surplus food crops for the market and later cash crops, to practice prescribed crop rotations, plant on specific dates and pay water rates. Another issue that arose in the implementation of irrigation activities was that of the size of the plots to be given to the natives. Two acres were deemed to be the most appropriate as it allowed farmers to produce enough to feed themselves while not taking too much of their time so that they could provide labour for the settlers. Following debates over the appropriate plot size for natives, in 1966 the standard plot size was set at 4 acres for male plot holders and 2 acres for widows. The allocation of plots to women however, raised concerns in the Department of Native Affairs. Women were considered to be staying at home engaging in domestic activities. Only widows got land on the basis that they provided for their families. Plot sizes were also

designed to enable government to resettle as many people as possible and to encourage the adoption of more intensive cultivation.

Irrigators were required to meet some of the costs of the developments. In 1932 the first water rent for natives was introduced. This was doubled in 1942. But irrigation was still subsidized by the government so as to achieve its settlement policy. But in 1958, there were concerns over the viability of irrigation. The costs of this activity were getting to be expensive. This was worsened by the fact that the schemes were expensive to operate and maintain mainly because they were constructed in physically difficult and largely unsuitable locations in pursuit of the political objective.

It was recommended that future projects be developed with an orientation to enable them to cover the maintenance and capital costs involved. But the white extremist ideology represented by the declaration of UDI resulted in more smallholder irrigation schemes being constructed. In 1965 the Tribal Trust Land Development Corporation (TILCOR) was implemented to foster black development through the establishment of a network of Growth Points. Irrigation developments took place in areas served by these Growth Points. Clearly ideological considerations were weighted more than economic considerations. It was only later that cost considerations were brought into the equation. In order to eliminate subsidies in irrigation developments, in 1973 the water rate was increased in order to discourage poor producers from staying on irrigation schemes.

The dispossession of native individual title over water was also extended to irrigation infrastructure where it is reported that some natives in the now Manicaland Province had their two irrigation furrows appropriated by the Native Department of Agriculture. The Mutambara community is on record as having resisted take over of the scheme with some success (Manzungu, 1999).

Soil-water conservation

As already said there were some important prohibitions in relation to the use of wetlands. The promulgation of the Natural Resources Act of 1941 prohibited the cultivation of lands within 30m of a riverbank. This stifled the development of irrigation furrows by natives as they fell within this restriction. Already existing furrows and *dambo* cultivation were labeled illegal. Another development was the establishment of the Department of Native Agriculture in 1944, which was responsible for enforcing conservation practices in native agriculture. Failure to do so would result in legal action, usually an arrest, being taken against the 'offending' natives.

While for white settlers, conservation entailed financial and other incentives, for Africans it entailed coercion and punitive restrictions on resource use (Mcgregor, 1995). Conservation legislation was passed from the 1920s to justify restrictions on resource use by Africans. Following the 1927 Water Act, the Native Reserves Forest Produce Act (NRFPA) and the Game and Fish Preservation Act passed in 1929, blame for environmental degradation was placed on African 'misuse' of the environment, which justified unequal restrictions on access to and use of resources. For example the NRFPA banned tree cutting in the reserves for any purpose except the 'direct fulfillment of subsistence needs'.

The appointment in 1921 of an Irrigation Officer responsible for soil erosion resulted in agricultural lands for settlers being contoured through the use of incentives. These were not extended to the black community. From 1929 onwards a policy of centralization was implemented. This involved the reorganization of land use, separating blocks for arable and grazing land for a central linear village for the natives located on the watershed (this was again justified on the basis of reduced land allocation for settling more Africans). Centralisation forced Africans to abandon their intensively managed wetland fields because the newly designated arable blocks were on drier, sandy and inherently infertile soils of the watersheds. These wetlands became part of the grazing lands. In addition, homesteads were put into what were called village lines. These were usually removed from water sources (McGregor, 1995). The new set-up increased the incidence of erosion because of the concentration of movements of people and animals along set roads and paths. It can be said that this modernization of indigenous agriculture, which also saw the introduction of the plough and ill-conceived and authoritarian conservation measures, not only downplayed the importance of indigenous knowledge but exacerbated environmental problems (Wilson, 1995). For example contouring exacerbated soil loss by concentrating runoff behind the ridges and in the processes under-utilised a much needed resource.

Post-colonial era

After looking at how the colonial state intervened in indigenous agriculture this section turns to the intervention by the post-colonial state. It begins by presenting the underpinning economic ideology before turning to interventions in the three areas, namely water resource management, irrigation and soil-water conservation.

Flip flops in economic ideology

Herbst (1990) has observed that the Zimbabwean post-colonial state lacked a political and economic ideology. It would appear that the socialism ideology developed during the years of the armed struggle did not represent a clear practical-oriented political programme. The focus of the nationalists had been to win political power resulting in a situation where no comprehensive ideology to benefit the Black population was developed. However, there was remarkable progress when there were attempts, albeit small, towards a black economic ideology. For example availability of state crop depots and cheap finance resulted in smallholder agriculture significantly increasing its share of such crops as maize and cotton (Herbst, 1990).

Most of the early post independence plans were on the consumption side with government routing resources to the disadvantaged black community. This was captured by such phrases as 'Growth with Equity'. The policy instruments for achieving the objectives were: establishment of a socialist society; rapid economic growth; balanced development and equitable distribution of income and productive resources; economic reconstruction; development of human resources; rural development; worker participation, development of economic infrastructure and social services, and fiscal and monetary reform (Roussos, 1988). The production targets were not achieved. Due to a slowing down economic growth rate and rising inflation in the mid 1980s Zimbabwe came under heavy pressure from international agencies to implement structural adjustment reforms. The country underwent selective and cautious reforms in the 1980s and did not adopt a structural adjustment programme until 1990 (Rukuni, 1994).

The structural adjustment programme had two important features: trade liberalization and reduction of government expenditure (Chakaodza, 1993). According to Chakaodza, within the context of these two features lie several conditionalities imposed on governments which intend to use the Bank's resources. The Economic Structural Adjustment Programme in Zimbabwe, which lasted about 10 years up to 2000, reversed most of the social advances that had been made. It also affected the productive sector, which was opened to competition. Smalholder agriculture suffered because of the withdrawal of essential support such as credit and state-subsidized markets.

After ESAP there was not much coherence in the economic ideology. According to a local newspaper

> Economic commentators can be forgiven for getting their recovery programmes mixed up. There have been so many of them that it is difficult to know which one is currently operational. First we had ESAP in1991, then Zimprest (Zimbabwe Programme for Economic and Social Transformation) in 1996, Merp (the Millennium Economic Recovery Programme) in 2000, and Nerp (the National Economic Recovery Programme) in 2003. None of these worked because government allowed populist posturing to take precedence over fiscal prudence. Now we have 'Towards Sustained Economic Growth' which forms part of the Marco-Economic Policy framework for 2005-6' (Muckraker Column, Zimbabwe Independent 26 November 2004).

This background explains the rather confused developments in the smallholder farming sector. Black agriculture did not fare any better because until 2000, resettlement was on poor quality land (Skalnes, 1995). The government also failed to put in place comprehensive supporting services such as maintaining adequate marketing depots, road network and transport, and extending credit. It must be conceded, however, that there was some success as represented by smallholder expansion in maize and cotton production, facilitated in large by credit and access to markets. Unfortunately this was not based on a sound economic policy hence the policy reversals. For example the number of loans advanced to smallholder farmers increased from 18 000 valued at Z$4.2 million (US$2.6 million) in 1980 to 77 000 valued at Z$60 million (US$40) in 1984. This decreased by more than half between 1986 and 1990 (ZCTU, 1996: 29).

Redressing past water injustices

The lack of a clear ideology can also be traced to the water reforms. For close to two decades into independence water resource management continued to be governed by the 1976 Water Act. In fact the water reforms that culminated in the 1998 Water Act began as a knee jerk reaction to the 1991/92 drought, the worst in the country's history (Makarau, 1999). The first step towards reviewing the 1976 Water Act was the setting up of an inter-ministerial review committee headed by the Ministry of Lands, Agriculture and Water development in mid-1993. The committee recommended that a new Water Act be put in place. In the short-term, smallholder farmers were allocated 10% of all water in government dams. This was the origin of the 1998 Water and Zimbabwe National Water Authority Acts.

The new Water Act had the following provisions:

- Water permits, valid for a limited time sufficient to earn back money invested to develop facilities, were to be issued instead of water rights in perpetuity. Priority would be given to efficient irrigation systems
- The priority date system was replaced with proportional water allocation.
- The polluter pays principle was evoked where people who cause pollution of water pay for expenses for removing the pollution.
- The environment was regarded as a legitimate 'user' of water competing with other users such as industrial, agricultural, mining and domestic users.
- The state owned all surface and underground water. Except for primary purposes (mainly for domestic uses such as drinking, cooking and washing) any use of water would need approval by the state
- Water would be managed by catchment areas, as rivers do not match political or administrative boundaries. All people with an interest in the use of water would be involved in making decisions about its use and management. Identified groups included representatives from communal, small-scale commercial and large farms and mines, as well as urban representatives from industry, manufacturing and municipalities. These would replace the River Boards (which used to supervise day-to-day management) and the Advisory Councils (which used to assist in water planning) and would have the responsibility of granting water permits, a function previously carried out by the Administrative Court.
- Water was recognized as an economic good. People who use water would pay for it
- A national water authority, ZINWA, would operate as a commercial enterprise. However, Government would ensure that the poor and disadvantaged would continue to have fair access to water.

While the water reforms could have had a local trigger in the form of the 1991/92 drought it was very much shaped by international donors (Manzungu, 2002; 2004). This is echoed by Campbell (2003) who asserts that the independent government of Zimbabwe predicated its policies on the colonial as well as neo-liberal concept of modern over subsistence farming. He also concluded that the old settler-dominated River Boards were somewhat reincarnated (with some black faces) as Catchment Councils that continued to wield power over water issues to the disempowerment of smallholder farmers. It should be added that the situation has changed since the fast track land reform programme. White commercial farmers who were active in the early stages (see Kujinga and Manzungu, 2004; Kujinga, 2002) have been replaced by a black elite. A research-based critique of the current water reforms in relation to how they affect rural livelihoods seems to converge on the consensus that the reforms did not facilitate the development of irrigation in the smallholder sector in general (see Manzungu, 2001; Mtisi, 2002). This is ironic given that the post-colonial state, led by people professing indigenous roots, has failed to capitalize on indigenous water and irrigation management experiences (see below). This has rendered the water reforms somewhat cosmetic.

While water allocation was the responsibility of the Water Court before the 1998 Water Act, this function has been delegated to the catchment councils. Catchment councils have had to try and allocate water with no guidelines on how to balance what are sometimes contradictory objectives. Research indicates that decentralisation to catchment and sub-catchment levels has in some cases resulted in a concentration of influence to a few already powerful individuals (see for example Kujinga and Manzungu, 2004). With regards to popular participation in water management, the state allocated itself disproportionately huge powers somewhat in contradiction to the democratic claims showing a lack of appetite for strong local institutions with sufficient political clout to complement the positive aspects of the water reform (Manzungu, 2001).

Meanwhile some of the good clauses have not been put to use. For example according to the new Water Act (Zimbabwe, 1998), the Minister has the responsibility to 'ensure the availability of water to all citizens for primary purposes …'. In order to execute this function it is the duty of the Minister to secure the provision of affordable water to consumers in under-privileged communities and to ensure that water resources are utilised at all times in an efficient manner having special regard to its value and the economic and other benefits that may be derived from it. It is important to state that these safety nets provided by the Act have not been utilized. In fact catchment and sub-catchment councils eager to raise revenue tended to work against the realization of these, thereby showing very weak ideological commitment to a noble concept. In Gwayi catchment there was a suggestion to levy a charge for every herd of cattle, which contradicted the legal provisions. In Save catchment cases, levies were proposed for any water use where some income was realized.

Faltering smallholder irrigation

Twenty years into independence the smallholder irrigation sub-sector in Zimbabwe was considered to be of little socio-political significance since its economic contribution was low. This was because of the fact that it accounted for a mere 10% of the country's irrigated area. (This has increased to about 26% since the fast track land reform programme incorporating the new model A1 and A2, and the communal and resettlement farmers. The A1 resettlement model was designed and intended to decongest communal lands therefore consisted of smaller hectarages with room for beneficiaries establishing a new home. The A2 model was designed to create a cadre of black commercial farmers on the concept of full cost recovery from the beneficiary therefore had bigger hectarages). A number of evaluation studies have suggested that formal smallholder irrigation schemes (initiated and constructed by the government and these may be community or government managed) have poor performance and are not sustainable. Problems identified include poor water utilization in terms of its timeliness and adequacy to the field and poor water application to the field (Pearce and Armstrong, 1990; Donkor, 1991; Makadho, 1993). Crop yields have been low and way below those achieved in the commercial farming sector. The poor agricultural performance has translated into poor financial and economic viability, thereby necessitating heavy government subsidies, up to 75% in some cases. This contrasts with Rukuni's (1993) assertion that the sub-sector is by and large financially and economically viable. The problem according to Rukuni is the inappropriate conventional budgeting technique, which ignores the sub-sector's unique history. Meinzen-Dick et al (1996) on the other hand, emphasises that agro-economic performance of smallholder irrigation schemes depends on a number of factors such as plot size, level of education of plot holders, access to markets and management structure. It is important to highlight that the state continued the colonial practice of controlling all irrigated activities in the schemes. For example farmers were required to follow set cropping programmes, and irrigation schedules (see Manzungu, 1999).

In 1983 Irrigation Management Committees were introduced in smallholder irrigation in order to improve coordination between irrigators and management. It is significant that these have not been able to take over management of the schemes principally because the state applied a technical measure to their readiness, which underlined state distrust of local farmer institutions (Manzungu, In press). There were also institutional problems where management was located in various ministries. This resulted in duplication of efforts and in some cases, in lack of clarity on division of responsibilities thus creating problems of coordination. Table 3 presents the main policy elements after independence.

Basically the various policies have not done much to change the status of smallholder irrigation. In some cases there were outright contradictions. For example the restrictions attached to the National Farm Irrigation Fund established in 1985 resulted in a situation where only Z$50 000 (US$30 000) was taken up by smallholder farmers compared to Z$6 million (US$4 million) taken up by white commercial farmers (ZCTU, 1996: 28). This contributed to the slow growth of smallholder irrigation (ibid.) It is also important to add that there was no support that was given to informal irrigation, which used a mixture of indigenous and introduced technologies and techniques. This sector, estimated to cover 20 000 hectares in the late 1990s (IFAD, 1997), was said to be more productive than the formal sector.

Table 3. Policy developments in post-colonial irrigation

Period	Policy Objectives
1981 – 1985	Government emphasises rehabilitation of the smallholder irrigation schemes
1986- 1990	Construction of new schemes under bilateral and multi-lateral arrangements; Development of irrigation infrastructure under the National Farm Irrigation Fund aimed at promoting wheat growing
1991 –2000	Steps taken to formalise farmers' participation in design, financing and management of irrigation; Promotion of self-financing schemes
2001→	No clear policy. Resource diversion to undeserving cases at the expense of smallholder farmers.

Source: Manzungu (1999)

Indigenous irrigation has therefore been undervalued to the extent that it does not feature in official statistics and policies despite the fact that it contributes significantly to rural livelihoods and sustainable resource management. Bolding et al., (1996) have commented on the merits of indigenous irrigation. They note that this contributed to food security and rural wealth for a number of reasons:

- Simple infrastructural set-up e.g. temporary stone weirs for diverting water from the river and earth furrows to convey water to the fields, which placed no heavy demands on required construction and maintenance skills,
- It tends to be much cheaper than government constructed schemes because of the use of locally available materials. For example intakes are made of brushes, which can easily be replaced. This is in marked contrast to government schemes some of which tends to have very expensive pumping outfits. It is quite common for such irrigation schemes to be shut down because of inadequate finances.
- Sharing of water tends not to be a problem as farmers stressed equity compared to the government schemes where government officials often forced impractical mechanisms.
- The state tended not to value the concept of hydraulic property, which is created when farmers actively participate in the design, construction and management of irrigation schemes.
- Agricultural produce is for both subsistence and commercial purposes unlike in government schemes where there is over-emphasis on commercial purposes against a background of unpredictable markets
- Furrows are spread in most cases along the river so as to ensure water supplies and catch run-off from catchments in between water abstraction points thereby limiting the possibility of conflicts over water between different furrows in times of scarcity
- Water rotation schedules are developed to cope with water scarcity and ensure equal distribution,
- Involvement of traditional leadership appears to have enabled and sustained these water scarcity management measures.
- Labour contribution for maintenance of the canal sometimes worked as a water distribution principle along the furrow,
- Water is perceived to be owned by no-one - everybody who has taken the trouble to bring the water to his/her land is considered to have a 'water right'. This principle is in times of scarcity translated into the principle of giving each other chances and leaving certain parts of the command area fallow.

The problems in the sector have however not abated especially following the removal of subsidies for smallholder irrigation and the transfer of irrigation management to farmers. Land reform through the Fast Track Land Reform Programme has worsened the situation as more smallholders are entering into irrigation with very limited knowledge of what is required. But by far the greatest problem relates to the neglect of traditional or customary water resource and irrigation experiences, which could have been used to put in place to support food security at the household level. One of the reasons behind this state of affairs is that these indigenous principles are not part and parcel of the official discourse. For example smallholder irrigation is said to have been introduced by white missionaries despite overwhelming evidence to the contrary.

Due to long standing problems (e.g. lack of secure land and water rights, technical deficiencies, limited farmer participation) smallholder irrigation schemes are reported to be facing a variety of operational and managerial problems culminating in low agricultural production and lack of financial sustainability (Manzungu, 1999; Chidenga, 2003). Even the newly acquired irrigated areas, thanks to the fast track land reform programme, wherein their former white commercial farm owners were achieving good crop yields and reasonable water use, are facing sustainability challenges (Utete, 2003). There was also limited support in the form of inputs and markets.

Soil-water conservation

In essence the philosophy regarding soil-water conservation did not change with the advent of independence. The famed contour ridge continued to be promoted all over the country. This is despite the fact that research by independent as well as government institutions has shown that the best technology in a dry environment is not one that drains water away from the field like a contour ridge but one that concentrates water in the field. Unfortunately this message has not been made part of the extension department's message. This is unfortunate in two respects. First, rainfed crops account for over 90% of the arable area in southern Africa. There has also been more understanding of the science of rainfed crop production, for example the concept of green water. Rockstrom, et al. (2002) observe that there are no agro-hydrological limitations to doubling on-farm staple food yields even in drought prone environments, by producing more 'crop per drop' of rain. This means that the low yields that are currently being experienced in Zimbabwe can be and need to be improved. It is important to make the point that while these interventions are being packaged as new, similar practices have been recorded (see Soper, 2002). What needs to be done is to search for such practices and analyse them with a view to draw out some lessons.

Discussion

The general objective of this paper was to assess the role that water legislation plays in promoting productive water use in smallholder agriculture in Zimbabwe. Our argument, which is worth re-stating, was that it is important to look behind the legislation to uncover the underlying ideology to assess to what extent the water legislation is matched to the social realities. It also allows for an inventory of related issues such as access to markets, inputs and finance without which productive water use cannot be attained. This section provides a brief synopsis of the role played by ideology in water resources, irrigation and soil water conservation development and management.

The role played by ideology was well illustrated by the colonial state which mobilized political, legal, economic/financial, technological and marketing resources in support of a white settler economic ideology to further the economic interests of the settlers. Upon this was constructed various pieces of water legislation, which facilitated the white hydraulic mission. On the other hand, the post-colonial state was less successful in achieving the much-needed black hydraulic mission because the legislation was not based on an economic ideology that was capable of achieving black economic empowerment in the agricultural sector in general and productive water use in smallholder agriculture in particular (see Herbst, 1990). In a way, this was epitomized by the absence of a coherent macro-economic ideology to catalyse economic and social growth based on the participation of the majority of the population. This was amply demonstrated by a water reform process that was not only about two decades late (introduced 18 years after independence) but was based on neo-liberal policies that were not geared towards popular productive water use. There was an embrace of neo-liberalism, emphasizing 'the market' and technical efficiency, as water use-regulating mechanisms (Manzungu, 2001). The legislation framing the water reform was torn between a neo-liberal and social agenda.

Below is a discussion of some of the issues that need to be considered and in some cases reviewed if productive water use is to be attained in the three identified areas. There is no effort here to discuss all the possible interventions –what is presented here is a selection of some of the pertinent issues that need to be attended to.

Water resource management

In water resource management the riparian doctrine and the concept of primary water are important issues for consideration. The riparian principle was debated throughout the colonial period. Standard technical arguments

such as it was not suited to water scarce areas advanced by McIlwain (1936) could not hold sway over the practical needs of farmers to be able to use water within the environs of their farms. This explains why the principle was never expunged from the legislation. It is ironic that it was expunged under the 1998 Water Act. It is ironic because the principle favours irrigation of small gardens for food production and income generation by smallholder farmers without having to endure ponderous and expensive regulatory requirements. Besides it is debatable whether the state is able to control the activities of small time irrigators in order to enforce compliance. At another level one wonders whether this marginalization or exclusion of the interests of rural stakeholders is the right approach to ensure that the riparian communities take an interest in water resources management as per the latest water legislation.

The concept of primary water use was generally accepted in both the colonial and post-colonial periods. What should be highlighted is that the current Water Act does not specify the quantities unlike in the past. The new approach is to let catchment councils set the limits. Empirical data suggests that the rights of some communities can be infringed upon. This underlines the need to review and expand the definition of primary water use. The best way is to increase the quantity of water defined as primary water or define it where it is not. On the same note it is important to remark that the safety nets that are provided in the Act do not seem to be of practical consequence. This perhaps epitomizes the lack of a clear ideological persuasion, which was evident in other aspects.

Irrigation

The idea of modernizing smallholder agriculture has characterized intervention in both the colonial and post-colonial era. This has resulted in a culture of evaluating smallholder irrigation on the basis of the technical efficiency of water delivery from the source to the field (and the crop). In addition, the focus on scientific observations as the standard for all agricultural practices has over-shadowed indigenous methods of water management in irrigation. Commercialization was also one of the pillars of the modern drive. If sustainable smallholder irrigation is to be realized there is a need to reflect on what exactly modernization means and how it can be used to improve the livelihoods of the concerned people.

It would appear that the point of departure between the state and farmers seemed to have been the definition of 'commercial' farming or what constitutes it. The state relied on scientific models of cropping programmes, crop rotations etc., and equated what was considered to be scientific farming with commercial farming. But farmers had no fixed philosophical position but looked for practical solutions that could improve their livelihoods. In this 'game' farmers do not consider themselves permanent commercial farmers (Manzungu, 2003). Depending on circumstances, they can be commercial farmers but also turn subsistence when the situation so demands. An informed analysis shows that this was about risk management. Issues of crop intensification based on market principles, where there is in reality no market, presented problems for farmers. Farmers were therefore reluctant to follow all the advice offered by state agencies precisely because of different perceptions they held about risk compared to that of the former.

The above discussion emphasises that one of the main reasons behind faltering smallholder irrigation was the neglect of indigenous water and irrigation management. State intervention tended to disenfranchise smallholder farmers because of the introduced legal systems. For example smallholder irrigators lost their rights over land, water and other resources. In fact the benevolence of the state as witnessed by 'donation' of smallholder irrigation schemes was a clear manifestation of ignorance of the concept of hydraulic property: Diemer and Huibers (1996) argue that irrigation development can be said to be a process of creating hydraulic property. For example individuals who help to build an irrigation system, either personally or through paid labour, receive a right to the water. Often a person's contribution to the initial investment equals that person's share in the water. Any allocation of water to later shareholders, no matter how complex, may in principle be traced to the configuration of initial shares. The co-owners usually unite in some kind of self-governing association with elected officers to define and enforce rules on the exercise of rights by members. Those wishing to join the association of owners of hydraulic property will have to either buy rights or be granted usufruct on the condition that they take responsibility for the maintenance of all or part of the infrastructure for the benefit of the early right holders.

What is important to highlight is that state intervention in smallholder irrigation development in Zimbabwe materially changed the concept and practices that allowed hydraulic property to thrive. The result has been that smallholder irrigation schemes are characterized by lack of clarity of farmer rights, be they individual or group rights. This situation perhaps poses the greatest danger to sustainable smallholder irrigation development.

Soil-water conservation

We see the same ideological problems in soil-water conservation in both the colonial and post-colonial periods. In this regard the contour ridge provides enough illustration. Contour ridging is one soil conservation practice that has been promoted throughout the country. The facts, however, are that due to the arid nature of the country, instead of using contour ridges to drain water from the field there is need to keep the water in the field (see for example Nyamudeza, 1999). In addition, the contour ridge is said to aid erosion in that it concentrates the movement of water in one area facilitating the washing away of the soil. There is however evidence about local innovations that are proving useful. For example, Nyagumbo (unpublished) reporting on a study in Chivi district says that '… a wide range of technologies were experimented on by farmers. Some of the technologies originated from farmers … The membership of farmers in clubs carrying out soil and water conservation had increased by about 400% in three years. In field crops, these measures included tied ridges/furrows, mulching, rock outcrop water harvesting and infiltration pits and included water conservation measures such as sub-surface irrigation, inverted plastic bottles, composting and mulching in vegetable gardens. It is also worth noting that some of the techniques originated from farmers and were simply revived by the project'. The increasing body of knowledge on *in situ* water harvesting, now donning the more fashionable term of greenwater (Rockstrom et al, 2002) renders state conception anachronistic and inimical to rural livelihoods.

Conclusion

One ideology or another has impacted water resource and irrigation development and management in Zimbabwe. As this paper has shown the colonial state had a better ideology in line with its objectives. While traditional water management practices have been realized to contribute to rural food security, there has been a failure to acknowledge these practices by both the colonial and post-colonial state. By so doing the latter, by design or default, perpetuated the undermining of traditional African agriculture that was instigated in the colonial period. This applied to measures meant to redress the problem as represented by the water reforms. Instead of devising strategies for local empowerment it would appear that the post-colonial state was compromised in this endeavors by the latest international water debates.

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Water rights and rules, and management in spate irrigation systems

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Spate irrigation is a floodwater harvesting and management system. Floodwater is unpredictable in occurrence and amount. It is emitted through wadis (ephemeral streams) and diverted to fields using earthen or concrete structures. Primarily based on the research conducted in some spate irrigation systems in Eritrea, Yemen and Pakistan, this paper discusses the impact on floodwater management of several water rights and rules, and the enforcement approaches used by various local organizations. It analyses if and how the water rights and rules have been tailored in response to changes in events in time, such as increase in irrigated area and structural modernizations; and how these affected the floodwater management. It assesses why national/provincial water laws became necessary for floodwater management following the modernization. The paper concludes by outlining what water rights and rules can achieve when applied in situations they were prepared for, and how negative their consequences can be otherwise.

Keywords: Enforcement, floodwater management, local organizations, spate irrigation, water rights and rules

Introduction

This contribution describes the water rights and rules in spate irrigation and discusses their role in water management. There are three reasons why we hope this paper can make a contribution to the central theme of this workshop (and hence took the effort to write it down). First is that it puts water rights in perspective. Different from perennial irrigation, in spate irrigation water rights are not fixed quantities or entitlements. Instead they are operating rules that respond to a variety of circumstances. This variety of circumstances is at the core of spate irrigation. The reason to emphasize this point is to move away from naïve and simplistic understanding of water rights, where water rights are seen as mechanisms to create distinctive ownership. In this naïve understanding - that can be traced back to work of the Douglas North on early land rights (North and Thomas, 1977) and the subsequent work in the field of New Institutional Economics - property rights are seen as the main institution to claim entitlements. At policy level water rights reform is often simplified as the intervention that will either help protect weaker interests on the strength of the property claim or alternatively help achieve better economic efficiency by facilitating trade and exchange of rights. The point we want to make is that water rights in spate irrigation (as in other fields of water management) are inseparable from the way water management is organized and that the rights are part of a bundle of responsibilities to the common group. Water rights are not something that precedes water management or can be used in isolation to change water management and water distribution.

The second reason to prepare this paper is that water rights and water allocation in spate irrigation rules differ between societies. In this paper we hope to provide some examples from Eritrea, Yemen and Pakistan. It is important to understand that there are higher forces at work to determine what rules and rights are to be implemented and that water rights are not only the product of the resource system itself. The last reason is to discuss how water rights change in the course of developing infrastructure, particularly in spate irrigation. Rights relate very much to operational rules and operational rules change with changing infrastructure - with different possibilities for upstream control and different common maintenance requirements. The set up of the paper is as follows. It first discusses the different operational rules and practices - giving examples from different societies. It then discusses the way local organizations and institutions have enforced (with various degrees of effectiveness) these water rights and rules, even have tried to codify it. Next, the paper discusses how some of the water rights and rules have changed over the past decades under the influence of particular external investment programmes. To start, however, we want to briefly describe what spate irrigation is.

Spate irrigation

Spate irrigation is a resource system, whereby floodwater is emitted through normally dry wadis (ephemeral streams) and conveyed to irrigable fields. It is a pre-planting system, where the flood season precedes the crop production period. In most spate irrigation systems in Eritrea, Yemen and Pakistan, the major floods occur between June and September, which is the time of heavy rainfall in upper catchments; and crop growth takes place between October and February exclusively depending on the water stored in the soil. To establish a spate irrigation system, there should be a mountainous or hilly topography that generates runoff; and adjacent low-lying fields with deep soils able to store ample moisture for the crops during periods with no precipitation (Mehari et al., 2004).

Spate irrigation systems support livelihoods of the often poorest segments of the rural population in the Middle East, West Asia, North and East Africa (Steenbergen 1997a and 1997b). The most comprehensive estimate of the land coverage of spate irrigation systems is the one compiled by FAO (1999) (see Table 1). It must not, however, be assumed that spate irrigation is practiced only in those countries listed in Table 1. The existence of spate irrigation is reported from Chile, Bolivia, Iran, Afghanistan, Mauritania, Senegal, Ethiopia and Kenya; but there is no reliable estimate of its land coverage.

Table 1. Spate irrigated versus total irrigated area in some countries of the world (FAO, 1999)

Country/Region	Year of irrigation data	Spate irrigation in ha (1)	Total irrigation in ha (2)	%of spate irrigation coverage (1/2)
Eritrea	1993	15,630	28,124	56
Yemen	1987/1997	98,320	481,520	40
Algeria	1992	110,000	555,500	20
Morocco	1989	165,000	1,258,200	13
Pakistan	1990	1,402,448	15,729,448	9
Tunisia	1991	30,000	385,000	8
Sudan	1995	46,200	1,946,200	2.5

In spate irrigation systems uncertainty is a given. The unpredictability in timing, volume and sequence of floodwater is the main cause of uncertainties and risks in crop production under spate irritation systems. It also can in theory confuse cooperation and create a free-for-all competition. Water rights and water distribution rules in spate irrigation, however, regulate access to water and - when enforced - minimize conflict. Water rights and water distribution rules also define the likelihood of irrigation for different areas and hence serve as the key to the collective maintenance and rebuilding of diversion infrastructure. Particularly, where floodwater users depend on one another for maintaining flood channels and (re)constructing diversion structures and this work is substantial, agreement on how water is distributed is a precondition for co-operation. Water distribution rules will also make it easier to predict which land will be irrigated. As such they encourage pre-flooding land preparation, which is important for adequate water storage and moisture conservation and key to high yields.

Water rights and rules in managing unpredictable floodwater

To manage the unpredictable nature of floodwater and reduce the risk of conflicts, several categories of water rights and rules are in place in different spate irrigation systems. The most common and widely applied rights and rules (Steenbergen, 2004 and Mehari et al., 2003) relate to the:

- demarcation of land that is entitled to irrigation;

- breaching of bunds;
- proportion of the floodwater going to different canals and fields;
- sequence in which the different canals and fields are irrigated;
- depth of irrigation that each field is entitled to receive;
- access to second (and third) water turns;
- distribution of large and small floods.

These categories of water rights and rules are discussed below with some relevant illustrative examples from Eritrea, Yemen and Pakistan.

Rights and rules on land demarcation

Demarcation rights and rules are common in the lowland spate irrigated areas in Eritrea, Yemen and Pakistan where water is scarce and land is abundant, and are almost inexistent in the central highlands of the countries where water is relatively more plentiful than land. Demarcation rights and rules define the boundary of the area entitled to irrigation and set priorities to access to water depending on the year of establishment of the different fields. Instead of merely regulating seasonal water supplies, the demarcation rules also predict what will happen when changes in the entire system occur. Spate systems are dynamic. Among others, changes in the course of rivers; breaching, silting up or scouring of canals; rising of fields above irrigable command levels, are frequent and can occur on yearly basis. Demarcation rules are conservative, because, in the wake of these changes they try to re-establish the prior situation. They often protect the prior rights of downstream landowners by restricting or even prohibiting new land development upstream, which could have resulted in the diversion of floodwater to new territories and a redefinition of the group of shareholders. To cite an example, in the Wadi Laba, Eritrea, about 1,400 ha (besides the annually irrigated 2,600 ha) were distributed in 1993 in the upstream Sheeb-Kethin area. The concerned farmers were, however, clearly informed that they would have to abide by the demarcation rule: new fields can only be allocated water after all the previously established fields have received the quantity of water granted to them by the other various rules. Due to the strict adherence to this rule, only 50 ha of the 1,400 ha have been established so far and the water right of downstream farmers has been preserved. In Eritrea, fields are considered to be fully established when they accumulate a minimum depth of about 10 cm of alluvial sediments. With mean annual sediment deposition of about 3 cm, this would require at least three flood seasons.

Rights and rules on breaching of bunds

Rights and rules concerning the breaching of the bunds of diversion and distribution structures and fields are widely applied in areas where the entire riverbed is blocked by earthen bunds, and the access of water to downstream canals and fields depends on the breaking of the immediate upstream structures. In many cases, the earthen and brushwood bunds are constructed in such a way that they breach during large flood (>100 m^3/s) events. This prevents damage to many upstream structures and fields while increasing the probability of irrigation of the downstream fields.

In several spate irrigation systems in Eritrea, Yemen and Pakistan, there are rules on when farmers can break bunds. For instance, once the area served by an upstream bund is fully irrigated or when a certain period of the flood season has lapsed. Boxes 1 and 2 present examples of some of such rules from Eritrea and Pakistan.

Box 1. Rights and rules on breaking bunds in the Wadi Laba and Mai-ule, Eritrea, established in 1900: our survey, 2003

In July and August, the peak flood months, if the large floods do not break the upstream *agims* and *musghas* (diversion and distribution structures), the upstream farmers have the obligation to allow the downstream farmers to break them purposely to allow the flow of water to their fields. July and August floods are considered to be rich in nutrients and all farmers are entitled to have a share. It is the responsibility of both the downstream and upstream farmers to timely maintain the structures to increase the probability of diverting the next flood(s).

In September, where floods are assumed to be low in nutrients and marginally important for crop production, the upstream farmers are not obliged to allow the breakage of their bunds.

If an upstream field receives an irrigation depth of a knee height, about 50 cm (see rule on depth of irrigation), the landowner of the immediate downstream field has the right to break the relevant bund and irrigate his field. If the downstream field holder is not on site during the irrigation period, the upstream farmer is not obliged to break his bund.

Box 2. Rights and rules on Nari system, Kacchi, Pakistan, prepared in 1917 on revision of old rules: our compilation, 2004

From 10 May to 15 August, the landowners of the upper Nari are allowed to make *gandas* (earthen bunds) in the Nari River.

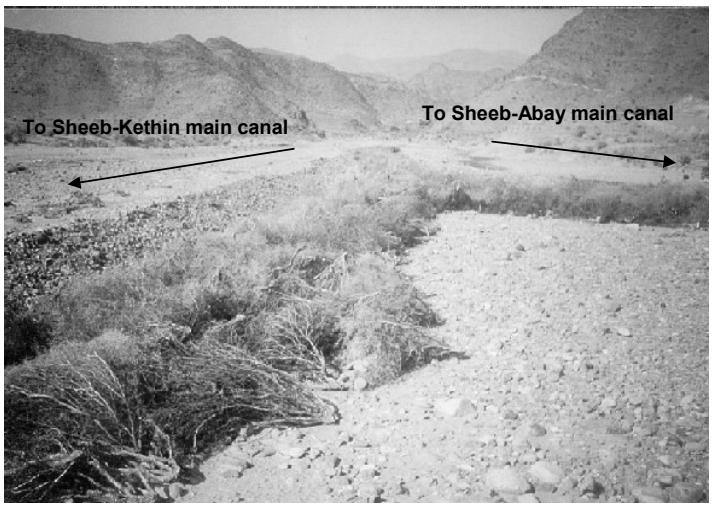
When the land served by one *ganda* in the Upper Nari is fully irrigated, the landowners in that *ganda* must allow landowners of the next *ganda* to break it.

After 15 August, the landowners of the Lower Nari are allowed to make *ganda* in the Nari River. Landowners in the upper Nari are not allowed to irrigate their land during this period or let the water go to waste. Water is not allowed to go waste to the low-lying areas East and West of the Nari River. Guide bunds will prevent water flowing to these areas. All landowners will contribute towards these bunds with farmers in Lower Nari paying twice the amount per hectare in case bunds on the upper Nari are broken.

Rights and rules on floodwater division

The rights and rules on floodwater division guide the distribution of water among different canals. In the indigenous systems in Eritrea, both proportional and rotational distributions of floodwater are practiced among the main and branch canals. During medium (25-50 m^3/s) and medium-large (25-100 m^3/s) floods, proportional distribution is used. This has a dual purpose. First, it irrigates two or more different areas at the same time. Secondly, by dividing the flow, it minimizes collateral damages such as destruction of structures and erosion of field bunds. During small and small-medium floods (<25 m^3/s), rotational distribution is the choice. The flow of these floods, if divided, may not have the strength to reach even the most upstream fields.

In many indigenous spate irrigation systems, flow division is made flexible in order to adjust to changing bed levels of the wadi and the canals, and to variations of the flow. One example of a flexible flow division is the Wadi Laba indigenous distribution structure (See Photograph 1). The structure is constructed from earthen material. Its downstream section is reinforced with brushwood that can be easily moved in and outwards to change its orientation as needed. The structure divides the flow from the wadi to two main canals - Sheeb-Kethin and Sheeb-Abay. The management of the structure is the sole responsibility of the farmers' leaders of the five main canals in Laba. Prior to each anticipated flood event, all the five leaders gather on the site. Taking into account the size of the different areas irrigated in the previous floods, they make a collective decision on how to adjust the structure so that the flows to each area are fair.



Photograph 1. Wadi Laba indigenous main diversion structure, the *Jelwet*: ours, 2000

Rights and rules on sequence

The rights and rules on sequence supplement the rights and rules on division of floodwater. They describe the route that water follows within the area entitled to irrigation by clearly spelling out which main and branch canals have priority right to water, and which fields are entitled to receive water first. The sequence usually adjusts to the level of the floods. In the indigenous Wadi Laba and Mai-ule spate irrigation systems, Eritrea, the underlining rule is: upstream canals and fields have absolute priority right to small, small-medium and medium

floods; and the downstream canals and fields have an equal priority rights to medium-large and large floods. This rule created a perception of fairness of water distribution among the farmers and strengthened the degree of cooperation among them. Most of the indigenous structures are constructed from earthen and brushwood materials. They are susceptible to frequent destruction by floodwater. The downstream and upstream farmers depend on each other for timely maintenance of the structures.

In the indigenous spate irrigation systems in the Tihama Plain, Yemen, the fundamental sequence rule, locally called '*al aela fil aela*', grants an absolute priority right to the upstream farmers regardless of the size of the flow. The downstream farmers are not, however, denied the right to surplus water after the upstream farmers have withdrawn sufficient quantity of water in accordance with their right. '*Al aela fil aela*' is an Arabic phrase, which when literally translated means 'the top is always at the top'; in this case, at the top list to get water. This rule might seem very unfair to the downstream farmers and might give the impression that the upstream have been utilizing almost all the floodwater. That was not usually the case. The indigenous structures have been frequently breached by large floods providing ample water to the downstream farmers, which in some years was more than the quantity of water received by the upstream.

Rules on depth of irrigation

The rules on depth of irrigation are not common in spate-irrigated areas in Pakistan, but are standard practices in Eritrea and Yemen where field-to-field water distribution system is practiced. In this distribution system, a farmer takes his turn, as soon as his neighbour completes the inundation of his land. He does so by breaking a relevant section of the bund surrounding the field of the upstream landowner. In this practice, fierce competitions usually arise among neighbours, which in many cases lead to conflicts. Probably, the rules on water depth were introduced mainly to mitigate such conflicts. In contrast, when each field (usually of very large size) is fed by its own separate intake, as is the case in many spate irrigation systems in Pakistan, such conflicts are rare, which might be the reason why the rules on the depth of inundation are unusual.

The rules on depth of irrigation could be viewed as complementary to the rights and rules on sequence, because they quantify the amount of water a certain field could receive during its turn. In Eritrea (Wadi Laba and Mai-ule) and Yemen (the Tihama Plain), the rule on irrigation depth states: each field is entitled to a depth of a knee-height (about 50 cm) at each turn. When the rule was first introduced hundred years ago, the farmers attempted to ensure its implementation by limiting the height of the field bunds to around 50 cm. With time, however, this became impractical. The sediments deposited in the fields are the only sources for maintaining the field bunds. Nevertheless, the degree of damage done to the bunds is not the only factor that determines the amount of sediments to be removed from the fields. Even when there is no maintenance work to be done, certain quantity of sediments need to be removed from some fields in order to keep the fields' level within that of the irrigable command area of the concerned structures and canals. The excavated sediments are re-deposited in the only convenient disposal places - the field bunds. This resulted in irregularities in the height of many field bunds. In Wadi Laba and Mai-ule, and the Tihama, the field bunds' heights range from 0.30 m to 1 m.

The farmers explained that the rule on breaking bunds, when first introduced before nearly hundred years only referred to the breaking of the bunds of the diversion and division structures. It was only ten years later that it was modified to include the breaking of field bunds when the farmers realized that it was impractical to standardize and limit the maximum height of field bunds to 0.50 m.

Rules on second turns

Several crops, although they can survive on one turn of water application, give significantly higher returns when they are irrigated more than once. Sorghum, wheat and cotton are examples. In the case of sorghum, which is the main crop in Wadi Laba and Mai-ule systems in Eritrea, the farmers informed that with one, two and three irrigation turns, they can harvest a maximum of 1 ton/ha, 2.5 tons/ha and 3.5 tons/ha respectively. Hence, to ensure that the majority of the fields receive at least one turn, thus guaranteeing most of the households to earn the minimum possible yield of food crops, a rule was introduced in the 1920's that defined the access to second turns. The rule states: regardless of its location, the type of crop grown in it, and the social and economic status of its owner, a field is allowed a second turn only after all the other fields that are entitled to irrigation (in line with the rule on demarcation), have received one turn. This rule has, however, some

practical shortcomings. The degree to which it is possible to honour it depends on the size of the flood. If the floods are small with no strength to reach the dry fields (especially under the prevailing field-to-field system), the only option would be to apply them to the area, which is already irrigated.

In Wadi Tuban, Yemen and Rod Kanwah, Pakistan, the rules on second turns are different than those in Wadi Laba and Mai-ule. They limit the access to second turns only to the most important subsistence crops, wheat in Pakistan and red sorghum in Yemen.

Rules on large and small floods

Finally, the water distribution may differ according to the size of the floods. One example given is the automatic flow division when floods are large and able to break the bunds in the various flood channels. In other systems there are explicit rules on how to accommodate small and larger floods. Small floods tend to be diverted to the upper sections of the command area, if only because small floods are not likely to travel that far. A rare example of explicit rules dealing with floods of different sizes concerns the Irrigation Plan for Wadi Tuban in Yemen (see Box 3).

Box 3. Water allocation rules for Wadi Tuban, Yemen: our survey, 2004

To ensure efficient use of spate water, irrigation is planned as follows:

When the spate flow is small (5 to 15 m^3/s), priority is given to the canals in the upper reach of the Wadi.

When the spate flow has a medium size (15 to 25 m^3/s), priority is given to canals in the middle reach of the Wadi.

When the spate flow is large (25 to 40 m^3/s), the flow is directed either to Wadi Kabir or Wadi Saghir in the lower reach of the delta depending on which one has the right to receive the spate water.

When the spate flow exceeds 40 m^3/s, the flow is divided equally between Wadi Kabir and Wadi Saghir.

Enforcement of water rights and rules

The type of enforcement strategies and the degree to which the water rights and rules can be enforced varies mainly depending on the social structure of the communities and the level of the overall governance in the area. In the spate systems in Eritrea, Yemen and Pakistan, the enforcement of water rights and rules can be related to the following three factors:

- local organizations and institutions;
- relationship between water rights and rules, and maintenance;
- codification.

Local organizations and institutions

Until 1970's, for the past six hundred years, the enforcement of the water rights and rules in many spate systems in Yemen had been the responsibility of the local '*Sheikhs* al-wadis' who were appointed by, and who worked under the direct and strict instructions of the local '*Sultans*'. '*Sheikhs*' is an Arabic term that usually refers to 'religious leaders'. In this case, however, '*Sheikhs*' means 'chiefs' who may or may not have any religious ranks. Hence, the phrase '*Sheikhs* al-wadi' refers to 'chiefs of the wadis'. '*Sultans*' is also an Arabic word and as used here, roughly means 'supreme leaders'.

Many communities in the Tihama Plain, Yemen that depended on spate irrigation for their livelihood comprised of several tribes. The '*Sheikhs*' and '*Sultans*' who had the leading role in the enforcement of the water rights and rules always belonged to the tribe that had the largest number of members; was the most powerful in terms of material and capital wealth; was believed to be the most native in the area. *Sheikhs* and *Sultans* were very respected and feared leaders. Their leadership was passed on hierarchical basis to the eldest son. In the Muslim spate irrigation communities in Yemen, the female gender had no right to be *Sultan* or *Sheikh.*

In Yemen, there were no other people or institutions that could challenge the ruling of the *Sultans* and *Sheikhs* regarding the implementation of the local water rights and rules. They had the final word, which all members of all the tribes within the concerned communities had to abide by, either willingly or unwillingly. Many of the interviewed elderly farmers in Wadi Tuban, Zabid, Mawr and Siham explained that the *Sheikhs* and *Sultans* were authoritarian, but they gave them credit for their effectiveness in safeguarding the water rights of the downstream farmers. To provide an example, in Wadi Tuban, Yemen, the *Sheikh*-al-wadi had the full power to impose sanctions on upstream farmers who take water in violations of the rules and/or without his permission. The sanctions, which were frequently applied upon approval by the *Sultan*, included:

- the concerned farmers were not allowed to grow any crop on their fields, and the immediate downstream farmers had the right to grow crops on the irrigated fields of their upstream neighbors;
- if crops were already cultivated, the yields had to be given to the immediate downstream farmers.

The interviewed farmers informed that due to mainly the high degree of heterogeneity in the level of power of the tribes, conflicts in the Tihama Plain were very intense and serious. The *Sultans* and *Sheikhs* were not able to prevent such conflicts from happening, but were often successful in settling them.

Following huge investments in the 1970's in structurally modernizing the indigenous spate irrigation systems in Yemen in general and the Tihama Plain in particular, the introduction of formal government and the collectivisation of agriculture in South Yemen, the task of managing the spate irrigation systems was transferred from the *Sultans* and *Sheikhs* to Government employees and staff in agricultural co-operatives, who over the years where faced with reduced funding inflows and erosion of authority. The majority of the interviewed farmers also spell out that after the reunification of Southern and Northern Yemen, the central Government further diminished the role of the co-operatives with out putting in place an alterative institution that could better handle the spate irrigation management, effectively creating a governance vacuum. Al-Eryani and Al-Amrani (1998), in support of this assertion, stated that due to the decline in the role of the co-operatives in the management of spate irrigation systems, a worrying vacuum was left that resulted in more conflicts between the upstream and downstream users.

The social structure of the Wadi Laba and Mai-ule communities in Eritrea differed significantly from that of the Tihama communities in Yemen. The Wadi Laba and Mai-ule communities did not comprise of a dominant tribe and had no *Sultans* and *Sheikhs* with absolute authority to enforce water rights and rules. Almost all members of the communities in the Wadi Laba and Mai-ule were largely homogenous in terms of land ownership, and material and capital wealth. Their landholding ranged from 0.5 to 2 ha, with the majority of the households owning 1 ha. Nearly all were poor living from hand to mouth.

For the past hundred years, till 2001, the authority of enforcing the water rights and rules in the Wadi Laba and Mai-ule was shared among the farmers' organization, and the Government institutions - the Local Administration and the Local Ministry of Agriculture. The farmers' organization came into being around 1900's and its key players were the *Teshkil (Plural: Teshakil), Ternafi (Plural: Ternefti)* and *Abay-Ad*. '*Teshkil'* is a local term that means a 'sub-group leader'. The *Teshkil* commanded a group of 20 to 40 farmers who usually irrigated through one branch canal. *The Teshkil* was responsible for implementing all the water rights and rules that apply to the farmers within his command. It was only on his request or on a request of a group of farmers unsatisfied with his judgment in, for example, resolving some conflicts that the respective *Ternafi* could interfere. *Ternafi* is also a local term that refers to a 'group leader'. The *Ternafi* had the authority to enforce rules and rights that govern the sharing of water among two or more groups of farmers led by a *Teshkil*. When conflicts arose between upstream and downstream farmers due to, for instance, the improper location and/or adjustment of a certain structure, and the *Ternafi* failed to satisfactorily solve them, he could request the *Abay-Ad* as a first step and the Local Administration as the last chance for mediation. Two or more *Teshakil* could also make the same request if the *Ternafi* did not. In solving conflicts, the Local Administration visited the site with experts from the Local Ministry of Agriculture and made a verdict, which was final and binding. *'Abay-Ad'* is a local phrase that means 'village elders'. These were a group of old men widely respected for their skill and impartiality in solving conflicts.

The concerned farmers elected the *Teshakil and Ternefti.* There was no time limit on the number of terms and years they could serve. If most farmers concluded that they were not performing well, however, they could remove them from their power by a simple majority vote. As was the case in Yemen, in the Muslim communities in the Wadi Laba and Mai-ule, females were not allowed to have any leadership position and to participate in any decision making of issues that affected the water management in spate irrigation systems. The cultural and social believes that led to such a restriction in women's participation, are still in place.

Unlike the *Sultans* and *Sheikhs*, the *Ternefti* and *Teshakil* had no power to impose harsh sanctions against those who violated the rules. Nevertheless, the farmers' organizations in the Wadi Laba and Mai-ule were able to successfully enforce the water rights and rules, protect the rights of the downstream farmers and minimize conflicts. Among the factors that led to this achievements included: the existence of the homogenous society that strongly believed in equity of water distribution; the fact that the *Ternefti* and *Teshakil* were democratically elected and were largely viewed as 'accountable' by their customers - the farmers; the unambiguous sharing of responsibilities between the leaders of the farmers' organization and those in the Government institutions.

Here, by 'accountable', it is meant that the farmer leaders effectively understand and represent the specific interests of the farmers. The degree of 'accountability' of any farmers' organization leaders greatly depends on:

- the nature of the relationship of the farmers' organizations with the respective Government institutions involved in the management of the system;
- the nature of the farmers' organizations themselves.

The nature of the relationships between farmers' organizations and the Government institutions range from "autonomy" to "dependence" in both the 'financial' and 'organizational' dimension (Hunt, 1990b). The more autonomous the farmers' organizations, the less influenced their leaders are by higher officials in the Government offices and the more accountable are to their customers - the local farmers. The farmers' organizations in the indigenous Wadi Laba and Mai-ule systems could be considered fully autonomous in the 'organizational dimension'- the 'organizational control of water'- as they were entirely responsible for making all decisions on how water should be shared and it was only on their request that Government institutions interfered. They could also be assumed as largely autonomous in the 'financial dimension' because most of the maintenance work of the indigenous structures had been largely accomplished by mobilizing the human labor and draft animals of the local communities. The Government institutions only provided some materials such as shovels, spades - even that on a request from the organizations.

The 'nature of farmers' organizations' refers to how inclusive the organizations are of the various wealth groups and the male and the female gender members of the community; and how representative their leaders are. There was no big gap between the rich and the poor in the Wadi Laba and Mai-ule communities and hence the wealth category did not apply. As stated earlier, the female members of the society, although allowed to be members of the organizations, they did not have decision-making voices and they were not allowed to elect or be elected. This exclusion of the female gender did not, however, affect the accountability of the organizations and their leaders as far as their activities in enforcement of water rights and rules were concerned. The household heads, usually the men, were fully represented in the organizations, and it was they who actually owned the land and who made all the decisions on behave of all the household members. Even in the case of the fewer than 5 % female-headed households in Wadi Laba and Mai-ule (widowed or divorced women), it was the close male relatives of the women who served as representatives of the households in making all the necessary decisions.

Relationship between water rights and rules and maintenance

The links between the water rights and rules, and the organization and execution of maintenance tasks can be categorized into three aspects. To start with the first aspect, in many spate irrigation systems, the right to floodwater is tantamount to one's contribution to maintenance of main and branch canals and structures. If one fails to contribute, one cannot simply be allowed to irrigate his field. This was a common practice in the indigenous systems in the Tihama, Yemen, but inexistent in many of the indigenous systems in Eritrea. As mentioned earlier, in Eritrea, most of communities engaged in spate irrigation were homogenously poor and their livelihood entirely depended on their spate irrigated fields. There was a strong believe in the society that

prohibiting a certain field access to water, because its owner - the household head - failed to report for maintenance duty, is not the right decision. Such an action was viewed as depriving the whole family of their very basic food for a mistake done by one of its members - the household head. Hence, in the indigenous Wadi Laba and Mai-ule systems, contributing labour was not a prerequisite for preserving your water right. The second aspect of the link relates the water rights and rules, and 'the critical mass' - the minimum amount of labour and materials needed for maintenance. In the indigenous Wadi Laba and Mai-ule and the Tihama spate irrigation systems, maintenance task was largely dependent on human labour and draft animals. In such situation, large task force was required, which could only be made available through strong cooperation between upstream and downstream farmers. The fact that tail-end farmers were only interested to share the burden of maintenance if they were not systematically deprived of their water right, made 'the critical mass factor' vital for serving as a check on too large an inequity in water sharing. To come to the third aspect of the link, water sharing rights and rules, in particular the rules on demarcation help to identify the group of farmers who are entitled to floodwater and who have interest in jointly undertaking the necessary maintenance job. Without the demarcation rules, it is very difficult to form a group of partners, making the organization and cost sharing of the recurrent maintenance work problematic.

The significance of the 'critical mass' has considerably diminished in many systems in the Tihama and may be affected in the Wadi Laba and Mai-ule systems in Eritrea mainly due to the structural modernization of the indigenous structures; and mechanization of the maintenance, which is usually undertaken by Government institutions. This is elaborated in the section: 'modifying/changing water rights and rules'.

Codification of rules

In all the spate irrigation systems in Eritrea, there are no complete records of water rights and rules either in the relevant Government institutions or the farmers' organizations. In most cases, however, the rules and rights are presented in plain unambiguous language, which has helped to easily and correctly disseminate them among large (greater than three thousand households) communities via word of mouth. In Wadi Zabid, the Tihama Plain in Yemen, the renowned Islamic Scholar Sheikh Bin Ibrahim Al-Gabarty is believed to have first recorded the rules and rights for distributing floodwater about six hundred years ago. Rights and rules on floodwater distribution in the Suleman range in Pakistan were codified by the revenue administration during the period of the British Colony in 1872. The documents, which are still available in a register, the Kulyat Rodwar, contain a list of all villages responsible for contributing labour for maintenance of the various bunds. The document also identifies a special functionary that was responsible for enforcing the rules. The Kulyat Rodwar and the rights and responsibilities contained therein are not updated, but the creation of this functionaries serves to keep the system flexible, as it allows the built-up of an institutional memory of 'jurisprudence'.

There is a large added value in codifying water rights and rules into written documents such as laws and regulations. It could at the least serve as basis for clarifying disagreements in interpretations and introduce a neutral factor in any dispute. The continued use made of the Kulyat Rodwar registry in Pakistan is a proof of the importance and relevance of codifying. Yet, codifying water rights and rules may not as such be sufficient to ensure that they are observed, and to mitigate conflicts. The ubiquitous disputes in Wadi Zabid, where powerful parties stand accused of violating the water rights and rules in spite of the presence of the more than six centuries old records; and the hardly existent vehement conflicts in Wadi Laba and Mai-Ule, although non of the rules and rights are codified; illustrate the point.

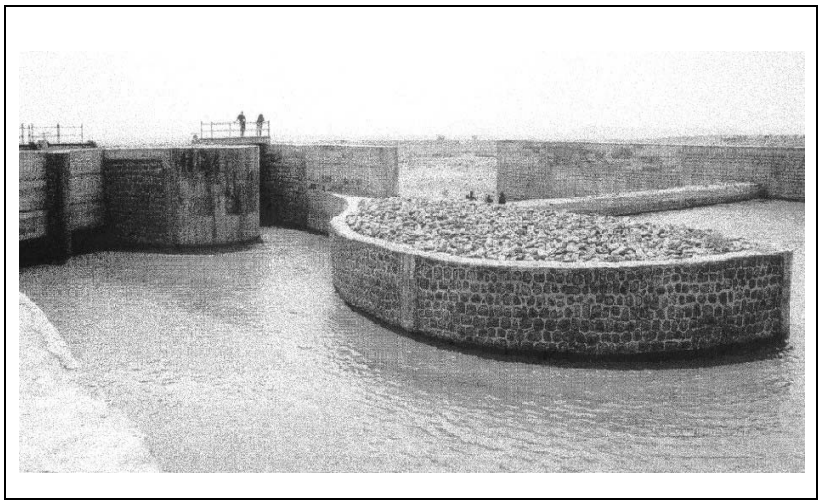
Modifying/changing water rights and rules, and their implications

If water rights and rules in spate irrigation systems are to continue to deliver, they must necessarily adjust to new situations created by various factors - new land development, changing in crop pattern, structural modernization (infrastructure investment); shift in power relations and change in levels of enforcement.

In this section, with the help of examples from Eritrea, Yemen and Pakistan, the consequences of tailoring some of the water rights and rules and the managing organizations in response to some of the mentioned factors, and a failure to do so, are discussed.

To start with the case from Eritrea, in the Wadi Laba, due to increase in the number of inhabitants, the land under spate irrigation increased from about 1,400 ha to nearly 2,600 ha between 1900 and 1990. As a result, the farmers explained that for twenty years (1960 to 1980), they consistently witnessed that even during the best flood seasons, their existing rules failed to guarantee that all the fields received at least a single turn. To deal with this new reality, by around mid 1980's, the farmers added a phrase to the 'water right on sequence' - 'in a new flood season, dry fields first'. Its full interpretation is that regardless of the location of the fields, in a new flood season, the fields that did not get a single irrigation turn in the previous flood season are irrigated once before any of the other fields get a single turn. An overwhelming majority of the interviewed farmers seemed content with the degree of the impact this modification had in preserving the perception of the fairness of water distribution that existed prior to the land expansion.

To provide another example from Wadi Laba, the structural modernization that was completed in 2001 replaced the flexible main indigenous structure (see Photograph 1) with a rigid permanent weir (see Photograph 2), and many other secondary earthen distribution structures with gabion.



Photograph 2. Section of Wadi Laba diversion weir: ours, 2003

The modern structures necessitate a different type of maintenance. They do not depend on labour and the collection of brushwood, but instead require earthmoving machinery, such as loaders, bulldozers and trucks, which in turn call for different organizations, managerially, financially and technically. The main factor in the past that was key for the enforcement of the water rights and rules during the indigenous systems was 'the critical mass' - the need for a large number of farmers that would work on collective maintenance. There is a risk that the different maintenance requirements will change the way that water distribution is organized. Though it is too early to say, in 2003 flood season, there were fifteen occasions witnessed by the authors when the upstream farmers utilized large floods and irrigated their fields two to three times before downstream fields got a single turn. These caused a lot of conflicts. The most downstream 300 ha did not receive a single turn in 2002 and 2003. The earlier rule on sequence and large and small floods was not applied, partly also because the new infrastructure attenuated the floods and effectively reduced the number of big floods, which were the ones that served the tail areas previously.

Over 30 years of management of spate systems by large Government irrigation institutions in Yemen have proven that such institutions have difficulty handling the task solely. Some of the factors include: poorly defined sharing of responsibilities and the long communication lines, which lead to slow decision making process; lack of adequate funding; little 'accountability' towards the bulk of users. More than anything the chronic under funding of maintenance and the loss of vigour in the operation and maintenance departments was the undoing. It left a vacuum where it was not clear who was responsible for water distribution, yet no one doing the hard work of timely maintenance.

If the relatively fair distribution of the floodwater that existed prior to modernization is to be preserved and the economic homogeneity of the Wadi Laba communities is to be largely conserved, the farmers' organizations in Wadi Laba and Mai-ule, which has run the system for hundred years and has good knowledge of floodwater management practices; must continue to take the lead role. To perform this task, the farmers' organization needs to have financial and organizational autonomy and hence its accountability. Great strides have been made with the establishment of the Wadi Laba and Mai-ule farmers' organization (also commonly called the Sheeb Farmers' Association) with almost full membership of all farmers in the area and the universal endorsement of its by-laws. The leadership of this new organization is very much on the time-tested system of *Ternefti* and *Tesahkil*. The main challenges in the coming period are the internal organization, the water distribution, the collection of adequate funding (also in the occasional disaster year), the running of earthmoving equipment and the operational fine-tuning of the modernized system. In addition, there are issues concerning some national and provincial laws that need to be considered. These are discussed below.

For the past hundred years, till 2001, the Wadi Laba communities neither relied on national or provincial laws and policies to manage their indigenous spate irrigation systems, nor did they bother to clarify what impact those polices and laws could have on the floodwater management. Since the structural modernization in 2001, however, some farmers and their leaders are frequently asking the question: after the huge financial investments, will the Government still allow us to continue to own and utilize 'our' land and floodwater? The urgency to get an answer to this question emanates from the perceived fear of the farmers that the Government may implement the '1994 Land Proclamation' to disposes them of the land they have considered theirs for decades. In Eritrea in general, and in the Wadi Laba and Mai-ule spate irrigated areas in particular, owning or having land usufructuary right is a prerequisite to securing a water right for agricultural production.

For decades, the farmers in Wadi Laba and Mai-ule have practiced the traditional land tenure system, the *Risti.* When literally translated, '*Risti'* means 'inherited land from the founding fathers'. Under this tenure system, ownership of land in a certain village(s) is vested on the *Enda* (plural: *Endas)* - the extended family that has direct lineage to the founding fathers of the village(s). The system is highly discriminatory against women. Besides, as it allows partition of the land through inheritance, it may also cause land fragmentation and render the farm plots economically non-feasible. However, the major tenets of the *Risti* (see Box 4) collectively provide strong sense of land and hence water security to the eligible landholders.

Box 4. The main tenets of the *Risti* land tenure system in Wadi Laba and Mai-ule: our survey, 2004

The *Enda* holds a lifetime ownership of land within the territories of its native village (villages). The land is distributed equally among the male *Enda* members. Only widowed women are allowed to own half of the parcel of land granted to men.

An individual member of the *Enda* has the right to utilize his plot for the production of whatever crops he wants. He has also an absolute right to inherit his land to his sons, lease or mortgage it. He can only sell the land, however, with the consent of the extended family- mainly the father, grandfather and the first cousins.

The village assembly, the *Baito*, together with the Wadi Laba and Mai-ule farmers' organizations are responsible for screening those eligible for the *Risti* land, distributing the available land equally among the eligible; and carrying out other related land administration tasks. They, however, have neither the right nor the power to confiscate a land allocated to a verified *Enda* member.

The 1994 Land proclamation refers to the *Risti* and the other indigenous tenure systems as obsolete, progress-impeding and incompatible with the contemporary demands of the country. Thus, one of its stated objectives is to replace/reform the traditional tenure system with a new dynamic system. Most of the provisions of the Proclamation (see Box 5) are important milestones, particularly in providing gender equity, and preserving the economic viability of the arable land. When some of its provisions are read against the background of the *Risti*, however, they seem to have given too much power to the Government at the expense of the farmers' organizations. This power shift may create (as it is seems is the case in Wadi Laba and Mai-ule) tenure insecurity.

Box 5. Some of the provisions of the 1994 Land Proclamation: our compilation, 2004

The Government of the State of Eritrea is the sole owner of all land.

All citizens of Eritrea above the age of 18 are eligible to usufructuary right regardless of sex, race, clan, *Enda* or beliefs. Any Individual may lease his/her usufratuary right over the land in whole or in part, but under no circumstance can he sell the land.

To preserve the economic viability of farmlands, partition of land through inheritance is prohibited.

A Land Administration Body (LAB) consisting of a representative of the Governments' Land Commission (GLC), members of the village assembly and farmers' organization leaders, and different local government bodies is responsible for classifying land and distributing it equally to the eligible by virtue of the proclamation and to those who make a living by farming. The LAB is a subordinate executive body with respect to Land distribution and it carries its functions under strict orders and directives from the GLC.

The Government or its appropriate government body has the absolute right and the power to expropriate land that people (regardless of their clans, *Endas*, race, sex, beliefs) have been settling on or have been using for agricultural or other activities, for purposes of various development and capital investment projects aimed at boosting national reconstruction or other similar objectives. This provision further states that compensation will be given whenever a land is confiscated, but it does not elaborate what such compensation will be, who decides on the nature of such compensation and whether or not the individual landholder or the farmers' organizations that represent him can challenge any compensation arrangements made by the GLC.

The provision of the Land Proclamation that grants the Government absolute power and right of land appropriation is the one frequently singled-out by almost all the interviewed Wadi Laba and Mai-ule farmers who expressed fear and nervousness with regard to their land and water security. The majority of the farmers believe that the Government would alter the cropping pattern from the current entire focus on food crops to high value cash crops to boost national production and recover the huge (about four million US$) investments made for the modernization of the Wadi Laba and Mai-ule systems. In an attempt to justify this assertion, the farmers point to the continuous push that they claim is being made by the Local Government and the Local Ministry of Agriculture to introduce cotton crop, despite their reservations. The farmers foresee that in the near future their status will be turned from landowners (users) into daily laborers under Government payroll. They contend that although they trust the Government will do all it can to provide reasonable compensation should it confiscate their land; no compensation will have a comparable value as the land they currently own and to which they attach a lot of pride. The farmers argue that they should be the once to decide whether or not to hand over their land once the Government reveals its compensation plans.

The farmers' analyses of the post-modernization situation of their irrigation systems, although it seems to have evolved from a genuine perception of land and hence water insecurity, it may as well end up being just a logical speculation. The Government has clearly stated that the objective of modernizing the Wadi Laba and Mai-ule systems is to improve the living standards of the concerned communities; and that it will ultimately entrust the operation and management responsibility of the systems to the farmers' organizations. If this noble objective is to be translated to reality, however, real and active farmers' participation throughout the ground-laying process and activities (this has yet to properly start) for the management transfer is vital. Nevertheless, such farmers' participation may not be achieved unless the perceived (by the farmers) land and water insecurities - justified or not - are addressed. We believe that introducing some complementary (to the Land Proclamation) easily understandable provincial/sub-provisional laws may be useful to this end. Among others, these may spell out: in the post modernization era, what kind of land and water user rights do the spate irrigation communities have? What decision making power do these user rights bestow on the farmers' organizations as far as the cropping system, modifying/changing water rights and rules, and other important land and water utilization activities are concerned? Do the farmers' organizations and the communities as a whole have any new obligations they need to fulfill if they are to retain these rights? If yes, what are they?

Another related issue that need to be given due consideration is the legality of the Wadi Laba and Mai-ule farmers' organizations. Although the organizations are officially recognized at the sub-province level - official in a sense that the sub-province Local Government and the Ministry of Agriculture acknowledge the organizations as important partners in the management of the irrigation system - the organizations can not yet be considered as having a full legal status. Their establishment and existence is not supported by any official decree or law, nor do they have the legal authority to, for instance, make direct contacts with donor agencies; own property such as machinery; operate independent bank accounts. We presume that it is useful

to introduce national/provincial laws that strengthen the legality of the organizations and provide them the authorities they need to cope with the new management challenges of the modernized systems.

To come to the example from Yemen, in Wadi Zabid, Siham and Mawr spate irrigation systems, the structural modernizations done in the 1970's replaced the indigenous earthen and brushwood structures with concrete weirs. This resulted in almost complete control of the floodwater by the upstream users. The '*al aela fil aela*' rule, although it granted an absolute priority right to the upstream farmers, as stated earlier, it did not usually cause unfairness of water distribution during the indigenous systems. This was because the indigenous structures were frequently washed away delivering water to the downstream. In contrast, the weirs seldom breach. Hence, applying the '*al aela fil aela*' rule effectively led to the 'capture' of the floodwater by the upstream. Due to mainly the vacuum of governance created after the fall of the *Sultans* and *Sheikhs*, who were replaced by 'weak' Local Government, the '*al aela fil aela*' rule was not modified to meet the demands of the new reality. Instead, the upstream farmers strictly applied it. Moreover, encouraged by the abundance of water furnished to them and the absence of any effective countervailing power, the upstream farmers shifted from the cultivation of food crops to more water demanding highly profitable banana crop on the basis of conjunctive use of groundwater and spate flow. This further reduced the amount of water that could have reached the downstream. The Local Government did not interfere to stop this change in cropping pattern. The ultimate consequence is that many of the downstream fields are now abandoned and their owners are earning their living on a crop-sharing arrangement by serving as daily labourers in the fields of the now rich upstream landlords. In Wadi Zabid, where the crop-sharing arrangement is more common, the tenants do all the labour work (from plating till harvest) for a return of a quarter of the harvest in kind.

The term 'weak' here refers to a Local Government which lacks: in-depth knowledge about local water rights and laws and approaches and strategies to enforce them; accountability to the poor segments of the farmers; the power to correct some unfair land and water utilization decisions taken by some individuals or communities.

As to the example from Pakistan, in Anambar Plain in Balochistan, one of the introduced modern weirs significantly changed the indigenous water distribution system. The weir was constructed to divert spate flows to upstream fields. It performed this function, but also considerably reduced the base flow to the downstream fields. This deprived the downstream farmers of their basic access to water granted to them by the water rules that had been implemented for years. Essentially, the design was made with a major oversight as to the prevailing water distribution rules. Hence, the weir became the main cause for many tensions and conflicts. Unlike in the Yemen case, the upstream community, faced with an equally socio-economically powerful downstream community, did not manage to maintain the water control power offered to it by the weir and did not shift from food crops to highly profitable commercial crops. As conflicts became unbearable, the two communities - in harmony - reached a mutual agreement - they purposely blew up the weir (see Photograph 3) and returned to their indigenous structures and water sharing arrangement.

Photograph 3. Deliberately destroyed diversion weir in Anambar Plain, Pakistan: ours, 1997

Conclusions

Water rights and rules mitigate the unpredictable floodwater supplies to a large extent by introducing a series of interdependent flexible regulation mechanisms that define acceptable practices on how water should be shared during each flood occurrence. They protect the rights of the farmers entitled to flood water; define the type of water sharing system and the sequence that should be followed in the event of different flood sizes; limit the amount of water a certain field receives at each turn; outline which field and when it is entitled for a second turn. Collectively, the water rights and rules create a perception of fairness of water distribution between the upstream and downstream farmers thus generating an atmosphere of cooperation between them. This in turn, enables the attainment of the 'critical mass' needed for accomplishing the important component of the floodwater management - timely maintenance of the indigenous structures. To perform these tasks, however, the water rights and rules must be observed by the majority of the farmers. This could be achieved only when there are local organizations, which are accountable to most farmers and that apply enforcement approaches that take into account the social structure of the concerned communities.

The water rights and rules are drafted and implemented in a way that they meet the floodwater management needs in a given situation. They need to be constantly tailored and the enforcement organizations and the strategies they use timely adjusted to cope with changes in events in time, if the above stated achievements are to be sustainable. Should this not be done, as was the case in some systems in Eritrea, Yemen and Pakistan, the water rights and rules can end-up being frequently violated and become sources of unfairness of water distributions and conflicts. This in turn could:

1. pave the way for disintegration of the long established local farmers' organizations; and cause the creation of a gap between the poor and the rich in what were rather wealth-wise homogenous societies;
2. accelerate the downfall of downstream farmers, leaving them unprotected against the illegal capture of the floodwater by the upstream farmers;
3. result in deliberate destruction of investment.

In general, national and provisional policies and laws have hardly any direct impact on the floodwater management in the spate irrigation systems. The water distribution and maintenance is operated by local water rights and rules and they are sufficient. Where national legislation could become helpful, however, is in providing farmers' organizations legal recognition and legal authorities to perform activities that would enable them to be financially and organizationally autonomous. This requires more than legislation however - it also necessitates sincere efforts to support the local organizations and graft them on earlier local organizations and avoid dual structures (traditional and formal) are created.

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Irrigation reform in Malawi: exploring critical land-water intersections

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Malawi, similar to other Southern African countries, has adopted new water, land, and irrigation policies and legislation involving promotion of decentralized management, user groups, and privatization of resources previously under customary or public tenure. We examine how the water and land policies intersect with the new irrigation policy, and are being played out in the context of two smallholder irrigation schemes in the Lake Chilwa Basin, which are being transferred to farmers' associations. This new policy setting has opened the door to contestation over rights of access to irrigation scheme plots by traditional authorities, scheme management personnel, and farmers. Rather than adopting a sector-by-sector focus, we examine how the policies are intertwined and interact with existing customary rights and practices in ways that have not been fully considered. The study demonstrates the need for a livelihoods perspective in determining who benefits and loses from these new policy directions.

Keywords: Smallholder irrigation, land-water intersections, livelihoods, Malawi

Introduction

Over the last decade Malawi, similar to other Southern African countries, has revised most of its environmental and agricultural policies and laws. Since 1999, new irrigation, land, and water policies and supporting legislation have been approved by Parliament. The thrust is to privatize resources which once were under customary tenure or which were viewed as a common good. Customary land is to be titled, use of water for productive purposes will require permits, and government-run smallholder irrigation schemes are being turned over to users. These reforms aim to dramatically alter access to critical land and water resources for rural livelihoods in one of the poorest countries in the world.

This paper focuses on the transfer of two government-run smallholder irrigation schemes in the Southern Region to farmers' associations in the context of the implementation of new irrigation, land, and water policies and pending laws. It provides a place-based analysis of the early effects of these reforms, drawing attention to how international and national policies and laws interact with local histories, practices, and economic and political hierarchies to yield sometimes unexpected results. The following questions are addressed: How are reforms underway in the land and water sectors likely to affect irrigation reform and smallholder irrigation scheme farmers? How do the new reforms interact with existing customary land- and water-related rights, privileges, and practices? Who is likely to benefit from the transfer of the irrigation schemes to farmers' associations? Will these reforms provide smallholder farmers – especially the disadvantaged – with equitable and secure rights to land and water resources as the policies espouse, or will they create uncertainty and entrench privileged interests?

The policy context

As land pressure and climate change intensify, Malawi is turning increasingly to irrigated agriculture as a means to increase production. Irrigated agriculture is regarded as a means to boost incomes and food security, and is considered to be a way to reduce poverty by government and donors. Malawi's new National Irrigation Policy and Development Strategy (GOM, 2000) reflects this stance. It calls for the rapid phase-out of government support to the sixteen smallholder irrigation schemes, and their transfer to newly-created farmers' organizations. The policy also advocates the expansion and intensified use of informal irrigation by small-scale farmers along streambanks, drainage lines, and in wetlands, a form of irrigation has received little previous government attention.

Transfer of government-run irrigation schemes to farmers' associations, often referred to as irrigation management transfer (IMT), has been widely promoted as a means to decentralize functions of the state, to reduce public expenditure, and to instill a sense of local ownership and responsibility. Malawi's new irrigation policy thus constitutes a significant departure from the past emphasis on costly government-supported smallholder irrigation schemes administered in an authoritarian, top-down fashion. Four conditions are usually present in successful IMT. First, IMT must improve the life situations of a significant number of scheme members; second, the irrigation system must be central to creating such improvement; third, the economic and financial cost of self-management must be an acceptably small proportion of improved income; and finally, the proposed organizational design must have – and be seen to have – low transaction costs (Shah et al., 2002:5; also see Vermillion and Sagardoy, 1999; Vermillion, 1997). In Malawi, although some aspects of IMT were adopted in the mid-1990s, it was not until 2000 that more fundamental measures were taken towards implementation.

Irrigation reform is being carried out in the context of other equally sweeping changes. Malawi's new Poverty Reduction Strategy Paper (GOM, 2002) is described as the "centre of government's plans and priorities," informing all new policy and legal reforms. The four pillars of the policy are pro-poor economic growth, human capital development, improving the quality of life for the most vulnerable, and good governance. The Local Government Policy and Law (GOM, 1998a and 1998b) have set in motion sweeping changes in how government will operate. While line ministries will retain responsibility for policy formation, enforcement, standards, and training, most administrative and political functions once concentrated in ministries at the national level are being transferred to the district and municipal levels under the control of District Commissioners and the District Assemblies. The District Development Committee and Plan are the principal means by which integrated sectoral planning is to be achieved. Marking a significant change from the past, civil servants now are to be accountable to the populations they serve, not to their parent ministries in central government.

Malawi's land and water policies have recently been revised as well. The new Land Policy (GOM, 2001) proposes to privatize customary land under the rubric of creating "customary estates." Titling committees are to be established at the level of Traditional Authorities (TAs) and Districts. Wetlands are to be designated as public lands under the control of TAs. The water policy has been under revision since 1999, and the final version of the new water law has yet to be enacted. The newest version of the National Water Policy (GOM, 2004), calls for the establishment of seventeen large Catchment Management or River Basin Authorities. It embraces the user pays principle in its approach to the management of both primary and productive or commercial water. Those using water for productive purposes are expected to obtain water user or abstraction permits. While a right to primary water is recognized, communities, non-governmental organizations (NGOs), and other entities are expected to bear the costs of infrastructure development and maintenance (Ferguson, in press; Ferguson and Mulwafu, 2002).

By and large, these policies and laws have been drafted and enacted on a sector-by-sector basis. Until recently, little regard was given to their interactions or to their relationships with local customary practices. In this paper, using a place-based analysis of two smallholder irrigation schemes, we draw attention to these critical interrelationships, arguing that the new land, water, and irrigation reforms need to be considered together and set within the broader framework of livelihood strategies and rights (Wolmer and Scoones, 2003).

Research sites and methodology

Irrigated land includes formal irrigation schemes operated by government and private estate owners, as well as lands along streambanks, in low-lying areas of residual moisture, and in wetlands cultivated by small-scale farmers. The formal irrigation schemes often are located in, and are surrounded by, wetlands and depend on the same water sources. An FAO report (1996) estimated that there were 76,410 hectares (ha.) of irrigated land in Malawi, of which 65% (50,000 ha.) was informal, or *dimba* cultivation, and the rest was under formal irrigation. A more recent World Bank estimate is 28,000 ha. are under "formal or semi-formal" irrigation, of which 6,500 ha. are under self-help smallholder schemes, 3,200 ha. are under government-run smallholder irrigation schemes, and 18,300 ha. are in estates. The common estimate for the potential irrigated area (not limited to wetlands) is between a quarter- and a half-million ha.

Our research focused on the Domasi and Likangala watersheds in the Lake Chilwa Basin in the Southern Region. This basin is home to six of Malawi's sixteen smallholder irrigation schemes slated for transferal to farmers' associations. Two government-run, smallholder irrigation schemes form the basis of our study: Domasi Irrigation Scheme located on the Domasi River in Machinga District, and Likangala Irrigation Scheme on the Likangala River in Zomba District. The Domasi Scheme covers approximately 500 ha. and has 1,500 farmers. Likangala Scheme is the largest one in the Likangala Complex, which comprises four smaller schemes as well – Khanda, Njala, Chiliko, and Tsegula. The study focused on the Likangala Scheme itself, which is 450 ha. in size and has nearly 1,300 farmers. Plots on these gravity-fed schemes are 0.25 acres in size. Rice is grown on both during the rainy season. In the dry season rice, sweet potatoes, maize, pumpkins, watermelons, tomatoes, and other vegetables are produced. Some of the plots are reassigned in the dry season for temporary use by others.

These schemes were established in the late 1960s and early 1970s to demonstrate to the local communities the methods and benefits of intensive cash crop production. Villages – originally located on the customary land taken over by government for the irrigation schemes – were resettled, given irrigation plots, and in some cases received other compensation. In contrast to other smallholder irrigation schemes established in the same period, neither Domasi nor Likangala experienced significant resettlement of farmers from outside the local area as occurred elsewhere (Chirwa, 2002). One exception was the Malawi Young Pioneers of the Banda era, who were brought in as agricultural trainers and disciplinarians. Between the late 1960s and the 1980s, the schemes were fairly well maintained but run in a top-down, authoritarian fashion by government (Krogh and Mkandawire, 1990). They received financial and technical support from government and donors, especially the Taiwanese Agricultural Technical Mission. The deepening economic and political crises of the1980s and the withdrawal of Taiwanese support forced government to reduce its role in scheme management and upkeep. During the 1990s, in particular, physical infrastructure continued to deteriorate. As Malawi made the transition from authoritarian rule to a multi-party democracy in the mid-1990s, farmers often ignored cropping calendars and other rules established during the Banda presidency. Thus, since the early 1990s, many of the formal authority structures governing the smallholder irrigation schemes have lost legitimacy. Farmers feel that the old rules and regulations were unfair and, like the regime that imposed them, should be rejected.

At the time of the study, the Likangala and Domasi Irrigation Schemes differed in the condition of their physical infrastructure, degree of farmer mobilization, previous support, and present source of funding for renovation and transfer to farmers. Since its inception in 1972, Domasi Irrigation Scheme has been fairly well supported by government and donor organizations, particularly the Taiwanese Agricultural Technical Mission and, most recently, the International Fund for Agricultural Development (IFAD). Although still in need of renovation, its physical infrastructure is in better condition than that of Likangala Scheme. Domasi is one of eight schemes included in the IFAD-funded Smallholder Flood Plains Development Program for physical renovation, farmer training, and transfer of ownership to farmers' associations. It has formed a Water Users' Association, has adopted a constitution and by-laws, and is likely to be the first irrigation scheme in Malawi to be formally handed over to the farmers' association. Likangala Scheme, in contrast, has received somewhat less government and donor support since it was established in 1969. Renovation and farmer training have proceeded slowly, and it was not until August 2004 that preparations for establishing a farmers' association were set in motion and a new constitution was adopted. Likangala is presently relying on much-delayed Highly Indebted Poor Country funds for renovation and transfer to farmers, but it is likely that IFAD, with funding from the World Bank, will become the new donor.

The study used quantitative and qualitative methods. In 2003, we conducted a survey of 123 farmers on the two schemes to gather baseline information on access to plots, farming and marketing practices, water use, and conflicts. We interviewed 63 (51%) farmers on Domasi and 60 (49%) on Likangala. An irrigation transfer or handover survey – to gather information on scheme governance and farmers' knowledge of and participation in the transfer process – was administered to 120 of those farmers, 61 (51%) from Domasi and 59 (49%) from Likangala. Overall, 26% of the respondents were women and 74% were men. All those interviewed in both surveys were plot owners.

Two field assistants were assigned to live on the schemes for the three-year period. In addition to engaging in participant observation and writing field notes, they carried out structured and semi-structured interviews with farmers and irrigation scheme committee members on assigned topics. The qualitative research enabled us to gather information on tenure and land-use practices, conflicts over land and water, and scheme governance that

was either not accessible or not reliable via formal survey research. To learn about developments in the policy arena, senior researchers interviewed key policy makers at the national and local levels twice a year. These included interviews with officials in the Ministry of Water Development, the Department of Irrigation, and the Ministry of Lands, along with major donors, including IFAD, USAID and the World Bank. At the local level, Irrigation Scheme Managers, committee members, Agricultural Development District officials, district authorities, and project managers of the Balaka Concern Universal office were interviewed. Finally, we engaged policy makers, project implementers, and farmers in an interactive process whereby we presented preliminary research findings for discussion through a series of workshops conducted over the research period.

Key findings

Six interrelated issues emerged from the research that are relevant to policy makers and academics concerned with equity and poverty alleviation in the implementation of the new irrigation, land, and water policies. Discussions with the Director of IFAD in Malawi and with officials in the Ministry of Agriculture and Irrigation, and a review of the literature on irrigation schemes in Malawi suggest that many issues identified below are not unique to Likangala and Domasi, but rather are arising on other schemes as well.

Livelihood strategies

The study revealed that the smallholder irrigation schemes play a vital role in the local economy of the Lake Chilwa Basin and the livelihoods of the farmers on them. The majority of the farmers interviewed were born in the district where the scheme was located – 83% of respondents in the case of Likangala and 84% in the case of Domasi – with most of the others born in a nearby district. Farmers on both schemes had diverse livelihood strategies. In addition to their irrigation scheme plots, 93% reported having upland rainfed fields, 16% had wetland gardens, and 29% had streambank gardens. Further, many plot holders had sources of income in addition to farming: 40% listed casual labor, 19% marketing of crops, 23% owned a small business, and 9% had other occupations. Despite their engagement in other occupations, plots on the irrigation schemes constituted the major source of most respondents' household food supply and cash earnings. When asked to rank which of their fields produced the most food for family consumption, 84% identified irrigation scheme plots, 12% said upland rainfed plots, and the remainder (4%) said streambank or wetland gardens. Seventy-one percent stated that three-quarters or more of their food for household consumption was scheme-generated, 23% said approximately one-half of their food was produced on the scheme, and only 6% reported that less than half came from scheme farming. Most cash earnings also were irrigation scheme-generated. When asked to rank which fields produced the most cash income, 97% said scheme plots. Eighty-five percent reported that three-quarters or more of their income came from the scheme, 12% stated that approximately one-half came from the scheme, and only 3% said that the scheme constituted less than half of their income.

The two irrigation schemes differed in important ways. There were differences in the number of years farmers had held plots, with turnover on Likangala being higher than at Domasi. At Likangala, 63% of respondents had farmed their plots for ten years or less, while at Domasi the figure was 37%. Domasi Scheme had a higher percentage of farmers (44%) who had been on the scheme for twenty years or more as compared to Likangala (17%).

Rice was the major crop grown during the rainy season. It was also the major cash crop grown in the dry season, but more Domasi farmers (60%) said this was the case than Likangala farmers (40%), where a wider range of crops was grown. The poor condition of the Likangala Scheme's main canal may partially explain this difference. In the dry season, many plots, especially those near the end of the main canal, do not receive sufficient water for cultivation. There were seasonal differences as well in the amount of time farmers spent working on scheme plots. While during the dry season 62% spent half or more of their time working on their plots, during the rainy season this figure rose to 87%. Farmers at Domasi spent somewhat more time working on their plots in the dry season than did those at Likangala: at Domasi, 68% reported working half or more of their time on their dry-season plots, while at Likangala the figure was 55%. This lower figure at Likangala can be attributed partially to the dilapidated state of the scheme.

Differences also existed between the two schemes in use of hired labor and in hiring out farmers' own labor. A quarter of the sample worked on other farmers' irrigation plots during the dry season. There were slightly more farmers on Likangala who reported doing this (30%) than at Domasi (21%). In the rainy season, 37% of farmers worked on plots owned by others. Again, slightly more farmers on Likangala (40%) reported engaging in this practice than at Domasi (35%). This suggests that Likangala plot holders were somewhat more likely to sell their own labor than were Domasi farmers. Domasi farmers, in contrast, were more likely to hire labor. There were important differences in hiring casual labor by season and between the schemes. During the dry season, 30% of farmers in the overall sample reported hiring others to work for them, while during the rainy season this rose to 52%, as rice transplanting is labor-intensive. In the dry season at Domasi Scheme, this constituted 40% of the sample, while at Likangala it was only 20%. In the rainy season, 64% of the Domasi farmers and 49% of the Likangala farmers hired workers.

In order to estimate differences in wealth among farmers, a ranking of the households' assets was undertaken, with scores ranging from 7 through 1576. Households were divided into three wealth categories. Over two-thirds fell in the lowest part of the range, 26% in the middle, and 7% in the top asset group. This reflects the distribution of poverty in Malawi and in the Southern Region in particular. A slightly higher percentage of Domasi (36%) than Likangala farmers (28%) had asset scores at the upper end of the distribution. Education also was a resource that was unequally distributed. The average level of schooling on the Domasi scheme was 4.8 years, while it was only 3.6 years among Likangala farmers.

Overall, our findings indicate that the irrigation scheme constituted farmers' major source of livelihood – including food for household consumption and cash earnings. However, the differences presented above suggest that Domasi plot holders were somewhat better off than those on Likangala along a number of dimensions, including number of plots owned, access to labor, and asset holdings. These findings suggest that irrigation scheme farmers are, on average, better off than Malawians who do not have access to dry-season irrigated fields. Many scheme farmers are able to plant twice a year or more and consequently are not as likely to experience food deficits as those without access to dry-season gardens. While they are not among Malawi's poorest farmers, many irrigation plot holders remain vulnerable, as the asset profile reveals. During the January-March 2002 period, the height of the recent famine, the field assistants reported that people on the irrigation schemes were consuming maize husks and grasses. Deaths, aggravated if not entirely caused by hunger, also occurred amongst families.

Tenure status

Under the previous land policy and law, the smallholder irrigation schemes were classified as public land, and they are slated to remain so in the new land policy and legislation. Newly formed farmers' associations will receive a lease for the scheme from government. Our survey and interviews indicated that many farmers, as well as irrigation scheme and government officials, did not know that the WUAs were to receive leases for the schemes. Thirty-seven percent of the farmers thought the scheme would revert to customary land and 27% thought it would become their own private property. Sixteen percent believed that it would remain government land, while 13% said the farmers' association would be the owner.

Uncertainty about the tenure status of the schemes and the plots on them has given rise to a number of misunderstandings. First, the concept of handover suggested to nearly one-fourth of Domasi farmers and a third of Likangala farmers that the land would revert to customary control. At Likangala, this perception has opened the door to ancestral claims, including efforts to limit access to the scheme to farmers from surrounding villages and attempts by TAs to reclaim ancestral lands. Second, farmers who assume that the land will revert to customary tenure rather than being leased from government by farmers' associations are less likely to understand the need to join the WUA or to follow its rules. At Domasi, for example, the majority of plot holders did not understand that the newly established WUA was their membership organization. Instead, they thought it was the new title of the old government-sponsored Scheme Management Committee (SMC). In fact, neither the new Domasi nor Likangala constitutions clearly states that access to plots is dependent on membership in the farmers' association, which appears to be the expectation of government and donors.

Rights of access to plots

Many farmers view the handover of the schemes as reversing patterns that have developed in the last decade. Some plot holders, particularly the wealthier ones, fear that the transfer will remove their opportunities for accumulation as new plot allocation arrangements may be put in place. Others are concerned that it will open the way for more "strangers" to gain access to plots.

One of the most contentious debates relates to who will have rights to access plots after handover. Is it people from surrounding villages, any person from Zomba or Machinga Districts, or any citizen of Malawi? When the schemes were established, the land was converted from the customary to the public tenurial system. Government assumed ownership of the land, and various governance structures were established to allocate plots and carry out other functions. Throughout the Banda era, these irrigation schemes became vital settlement sites for school dropouts and party loyalists. The Malawi Young Pioneers, the paramilitary youth wing of the Malawi Congress Party, played a significant role in training and maintaining discipline. Until the recent adoption of new constitutions at Likangala and Domasi, any citizen of Malawi could technically ask for a plot by applying to the SMCs. In the immediate post-Banda period, absentee farmers and plot seekers from urban areas increasingly began to obtain plots through informal renting and borrowing/lending arrangements and, in some cases, allocation from the SMCs. This influx of "outsiders" might partially explain the higher percentage of farmers on Likangala who had held their plots for ten or fewer years as compared to Domasi. Likangala is closer to Zomba city, and the roads to it are better maintained than those to Domasi.

Dry-season rotation of plots was another way that those who did not normally have access to the schemes gained temporary use. On Likangala and Domasi, the SMCs would reallocate plots each dry season, allowing those who did not normally have plots to use them. Farmers interviewed were generally supportive of this practice: 83% said it should be continued after handover. The reasons that they gave included helping people who did not have enough food, and giving access to those who did not have plots or whose lands did not receive enough water. Although farmers were supportive of this dry-season plot rotation, many criticized the way it was carried out, claiming that the SMC was corrupt and often allocated plots, not to the poor, but to better-off farmers and city dwellers.

As noted above, many farmers and some officials assumed that the schemes were being handed back to TAs or to local farmers. As a consequence, considerable ambiguity now surrounds the issue of who should have rights of access to plots, especially at Likangala Scheme, where this has become a heated issue. There, one village headman has encouraged farmers from his village to take over plots on Blocks B and C from other farmers. He bases his claim to these blocks by saying that these were his ancestral lands and, since the scheme is being turned back to farmers, the plots should be allocated to those from his village. There are also historical reasons for his actions. The village headman and many members of his village were exiled to Mozambique when former President Banda banned the Jehovah's Witnesses in the early 1970s. When they returned in the early 1990s, they had very little land on which to cultivate and were refused scheme plots (Nkhoma and Mulwafu, 2004). Other village heads have said that if this headman is allowed to claim the scheme land as his village land, they will do the same. We found that several of them had accumulated irrigation plots and were renting them out. This practice resembles the one that has developed in the Lake Chilwa wetlands (Kambewa, 2004; Peters, 2004). One village headman, who claimed sections of the scheme as land for his villagers, specifically said that the reason one of his peers was not doing likewise was because he drew considerable income from the payments he received from the wetland plots he allocated.

The new Likangala constitution, adopted in 2004, states that access to plots is dependent on being from Traditional Authority Mwambo. The Domasi constitution contains a similar, if somewhat more vague, clause asserting that access is limited to citizens of Malawi who are residents of the area. This focus on local ownership reflects some of the historical tensions, described above, concerning displacement from ancestral lands, as well as concerns that plots are being unjustly allocated to outsiders.

Women's access to plots and voice in management decisions have not been addressed directly in farmer training to date, although the new irrigation policy includes strong statements supporting women's equal participation in irrigated agriculture. The Domasi and Likangala Schemes are located in an area of matrilineal

inheritance, and many women have plots on the scheme. At Domasi, Concern Universal estimated that of the 1,500 registered plot holders, 47% were women. Asked whether women should be allowed to register plots in their own names, an overwhelming 95% of the respondents at Domasi said that they should, while 88% affirmed the same at Likangala. At Likangala, where the 2004 constitution limits the number of plots a family can hold to four, it is not yet clear what will happen to plots registered in a woman's name when the husband also has plots and the total number exceeds four. The new land policy and law proposes to make inheritance more equitable by not recognizing either customary patrilineal or matrilineal inheritance practices, calling instead for children of both sexes to inherit equally from parents. It is too early to determine what the effects will be on women's land rights, but in a context where patrilineal inheritance is taken as the norm by most policy and decision makers, women in the Southern Region may lose land rights, while those in the Center and North may not gain greater rights.

Landholding size

When the irrigation scheme lands were originally parceled out to farmers in the late 1960s and early 1970s, they received two to four plots, each one constituting 0.25 acre. The baseline survey revealed that the average number of plots held by respondents in 2003 was greater on Domasi than on Likangala Scheme. The Domasi mean was 3.9, while on Likangala it was 2.7. Overall, 18% of the total sample reported farming five plots or more – 8% of Likangala and 17% of Domasi farmers. However, this survey information most likely underestimates the actual degree of plot concentration that exists on the schemes. Accurate information on the number of plots owned or used by farmers was difficult to gather, as no updated list of plot holders and the number of plots registered in their names existed on either scheme at the time of the study. In addition, farmers participating in the survey may not have provided accurate information on landholdings due to the sensitivity of these issues in the current context of change. Ownership of more than four plots and renting or lending plots were widely thought to be against the rules. While the actual degree of land concentration is hard to measure, information gathered through qualitative approaches permitted us to address this issue and to identify the processes involved in plot concentration. This suggests that over the years, and especially during the 1990s, scheme land has become more concentrated in the hands of the better-off farmers, especially those in positions of authority, often through renting and borrowing.

Today it is not unusual for wealthier farmers to own or farm more than four plots, especially during dry-season cultivation. For example, even using the available survey information, 61% of those in the two highest asset classes at Domasi admitted to farming five plots or more, while at Likangala the figure was 29%. Many newly elected members of scheme committees have more than four plots. Some officials on the Domasi WUA Executive Committee own over ten plots, while some of those on the new Likangala SMC own twelve or more plots. Further, these are usually plots with the best access to water. Plot ownership at the household level can be much greater than these figures suggest, as spouses and children often have plots registered in their names as well. In addition, qualitative research revealed that some farmers and scheme officials made use of fake names to gain additional plots.

The new 2004 Likangala constitution states that families (banja) – including the husband, wife, and children – may own no more than four plots in total. It is too early to determine whether committee members farming four or more plots will be willing to enforce these limits. In many cases, however, it is worth noting that the very people who have been given authority to enforce new regulations are the ones known for violating them. At Domasi, on the other hand, the constitution is vague on the issue of the number of plots that can be farmed, stating only that WUA members have a right to "a profitable landholding size according to agreed criteria for land allocation."

Accurate information on renting and borrowing is equally hard to obtain. Field observations suggested that both are widely practiced on the schemes and further concentrate plot use. For some farmers, the regulation that land not cultivated for two years reverts to the SMC spurs renting as a means to deal with hardships of various kinds. Those who are unable to cultivate their plots because they lack inputs, do not have sufficient labor, or are sick, may rent to better-off farmers and end up working as laborers on their own or others' fields. During the dry season when plots are reallocated, people from town may gain access to them via allocation from the SMC or by renting from other farmers. The 2004 Likangala constitution declares that renting of plots

is illegal and constitutes one of the reasons why a plot holder can be expelled from the scheme. It may be difficult to halt this practice for at least two reasons – its widespread occurrence and the fact that it meets the needs of both wealthy and poor farmers. The Domasi constitution makes no mention of renting or borrowing, perhaps because of these same reasons.

In summary, some farmers have used a variety of mechanisms to gain access to more than four plots, including serving on scheme management bodies or having close connections to those who do, plot ownership by spouses and children, renting and borrowing, and, in some cases, use of falsified names. All of these practices work against broadening access to plots which, as pointed out above, are a premium livelihood resource. While the 2004 Likangala constitution seeks to broaden access to plots by limiting the number a family can own and by barring renting, at this point it remains to be seen if plot redistribution will occur or if the constitution will be amended.

Rehabilitation and capacity building

A critical aspect of rehabilitation of the irrigation schemes is capacity building. Farmer participation in the setting terms of the handover process and training in scheme maintenance and management is an integral part of the rehabilitation process. Our findings indicate that capacity building has not been effective to date. In the case of Domasi, Concern Universal was contracted to train farmers at a time when rehabilitation of the scheme was already at an advanced stage. At Likangala, farmers have been mobilized to supply labor for rehabilitation, but there has been little discussion to date of incorporating capacity building as part of this process.

Rehabilitation of canals, headworks, roads, and other facilities on both schemes has proceeded slowly due to numerous factors. These include delays in funds and supplies, inputs going missing, problems with local contractors, heavy rains that destroyed renovated structures, farmers' reluctance to provide labor, and other complications. Delays have been greatest at Likangala, which depends on government funding for renovations. At Domasi, the targeted date of rehabilitation and handover has changed twice – initially it was scheduled for December 30, 2002, and then for September 30, 2003. By mid-2004, government officials recognized that rehabilitation and handover would not be a single event to be completed by a specified date, but rather a phased process likely to take considerably more time than anticipated.

Many farmers regarded rehabilitation as a government responsibility and were reluctant to take ownership of the scheme until it had been completely refurbished. This suggests that farmers, not only WUA Executive Committee or SMC members, should be involved in rehabilitation decision-making processes from the onset. Since funding is not adequate to fully renovate the schemes, meetings are needed where farmers, together with specialists, identify and prioritize the repairs. Farmers' involvement in decision making, not only labor, can instill a greater sense of responsibility and can help build the skills needed to manage the scheme in the future. When asked, 87% of farmers (92% on Domasi and 81% on Likangala) said they had taken part in the physical rehabilitation of the scheme, but only 41% (52% on Domasi and 29% on Likangala) said they had ever attended a meeting in preparation for rehabilitation and handover. Indeed, many of those at Likangala opposed the transfer, as they were afraid that they would inherit a dilapidated main canal and other structures they could not afford to fix. Many did not see how they could succeed in running the scheme when the government, with all its resources, had failed.

At Domasi, until recently almost all attention focused on training newly elected committees to carry out their functions. Indeed, only 13% of the farmers in the overall sample said they had received some training on handover issues. Twelve of these fifteen farmers were from Domasi and all were members of scheme committees. This indicates that the "Training of the Trainers" model that was used was ineffective, as little training of farmers themselves has taken place. Generally, decisions were made by a small group of committee members and government and scheme officials, and were announced at general WUA meetings. Such concentration of knowledge and authority in the hands of committees means that farmers will be poorly equipped to exercise their rights and obligations in the new governance structures.

Much the same is occurring at Likangala, where a meeting on problem identification and constitution building occurred in early July 2004, involving village headmen and other TAs, scheme committee members, Rural Development Project (RDP) officials, and a small number of farmers. At this meeting, Zomba RDP officials, in effect, imposed a new constitution on those in attendance in the name of "participation" and "consultation."

A week later the constitution was presented for ratification at a general farmers' meeting attended by less than twenty farmers not holding elected or appointed office. Few farmers knew that there was a draft constitution or that a meeting was going to take place to discuss it, let alone the provisions contained in the document itself. At the ratification meeting, the constitution was read to the farmers and they were asked to endorse it. Barely a week later, another meeting was held to elect a new SMC. Top-down actions of this sort are reminiscent of the Banda era and will not result in widespread understanding of or support for new rules and committees.

The study revealed that critical issues related to land and water rights and responsibilities still remain to be clarified. Table 1 indicates that considerable uncertainty prevailed when farmers were asked questions regarding their rights to land once transfer took place.

Table 1. Farmers' knowledge about transfer of the irrigation scheme – rights to plots

Questions	Yes	No	Don't Know
When will transfer of the schemes to farmers' organizations take place?			98%
Will borrowing or lending of plots be allowed after transfer?	33%	56%	11%
Will renting of plots be allowed after transfer?	37%	55%	8%
Will buying and selling of land be allowed after transfer?	8%	84%	8%
Will there be a limit on the number of plots a farmer can have after transfer?	32%	53%	15%
Will dry-season plot rotation continue after transfer?	48%	40%	12%

Source: Ferguson and Mulwafu (2004)

There was also confusion in other critical areas. As noted above, 38% of the total sample believed the schemes would revert to customary land after transfer. While 80% knew the irrigation scheme held a water abstraction permit, there was disagreement over what would happen to it after handover. Fifteen percent thought the government would continue to hold the permit, 18% thought it would belong to the farmers' association, 12% thought that farmers would have to get permits, 26% said the permit holder would be the SMC or the WUA Executive Committee, 7% mentioned TAs, and 22% did not know.

Uncertainty surrounds the issue of plot inheritance as well. Farmers at both schemes have been accustomed to leaving their plots to their spouses, children, and other relatives. The new Domasi constitution says that plots can be left to a specified next of kin who must be identified on the plot holder's WUA membership card. The Executive Committee has the power to approve or reject this choice, as it has the authority to determine if the next of kin meets membership criteria. The implication is that inheritance will be limited to one family member in good standing with the WUA. This clause may generate opposition since it contradicts what has become local inheritance practice. In the opinion of many Likangala farmers, only when the plot holder is unmarried and has no offspring do the plots revert to the SMC for redistribution, and then usually half go to relatives of the deceased and the remainder to non-family members. However, the new Likangala constitution states that upon the death of the holder, the plots are to revert to the SMC, which may redistribute them to the deceased's relatives or to others as they see fit. In the past, the SMC has sometimes used the occasion of a death to obtain plots and reallocate them, often to powerful, influential people – including members of the committee itself. Given these practices, the inheritance clause in the new constitution is likely to generate opposition once it becomes more widely known.

These critical issues concerning land and water rights are as important to address as is the physical rehabilitation of the schemes. While one of the goals of the transfer of the irrigation schemes to farmers is to promote greater "ownership," at this point it appears that farmers' rights to plots are more insecure today than they were in the past. Women's rights to plots are even more precarious since it is unclear in whose names the plots will be registered and who will inherit them.

Authority structures

Although the schemes are government land and TAs are not supposed to be involved in land allocation or dispute settlement on them, over the years, as government has withdrawn from the schemes, they have gained greater voice, especially in solving disputes. The Domasi and Likangala constitutions state that chiefs are not to take part in plot allocation or dispute resolution on the irrigation schemes. However, this appears to be at odds with the new local government law and decentralization policy, which give TAs identified roles in local administration.

Confusion exists especially concerning the roles of TAs in solving disputes that arise between farmers on and off the schemes. When asked who solves such disputes, 57% said the WUA Executive Committee or the SMC, and 38% said chiefs, while 5% didn't know. Because decentralization and many other processes of reform are occurring at the same time, lines of authority are often unclear to farmers and sometimes even to officials. This raises opportunities for multiple interpretations of rights and competing claims to land, water, and other resources.

Although the water, irrigation, and environmental laws are being harmonized at the policy level to resolve areas of ambiguity and conflicting clauses, questions about how the new structures will function on the District or local level in relation to existing rights and practices have been largely overlooked. One of these questions involves the creation of river basin or Catchment Management Authorities (CMAs) as proposed in the new water policy and pending law. Malawi has been divided into seventeen large catchment areas, which are drawn according to hydrological criteria and, in many cases, cross political-administrative boundaries. Two or more Districts may fall within one CMA. While the catchment approach makes environmental sense, it creates another administrative structure that has to be negotiated and financially supported. It is unclear how Catchment Councils will work with District Councils and other political administrative units (Derman et al., 2000). In fact, this has been a significant issue in Zimbabwe, where the same organizational structure was put into place. There, CMAs include representatives of districts, local representatives of various ministries, and major water users such as commercial farmers, smallholders, and mining and urban water user representatives. For district authorities and smallholders alike, the transaction costs of participating in these meetings are high, and they often lack funds to attend. Water users also have to travel long distances to Catchment Authority offices to pay fees or obtain services (Nicol and Mtisi, 2003; Derman et al., 2000; van Koppen et al., 2004). In other words, what makes environmental sense presents administrative challenges. In Malawi, financial problems exist as well, as sustainable sources of funding for the CMAs have yet to be identified.

Discussion and conclusions

Malawi has embarked on what constitutes a radical redefinition of tenure and governance structures related to key land and water resources. These new policies and laws draw on neoliberal development thinking with its emphasis on private-sector initiatives, redefinition and reduction of the role of the state, and promotion of new decentralized, stakeholder-driven, and community-based management institutions. The new irrigation, water, and land reforms embody these characteristics. The study addressed the question of whether theses new directions are likely to broaden smallholder irrigation scheme farmers' – especially disadvantaged ones' – access to the critical livelihood resources of land and water. Because these reforms are still underway, our findings are preliminary in nature, but can be used by policy makers and program implementers concerned with monitoring their implementation and possible impacts. Indeed, information at this stage may be of greater practical benefit than such studies at a later date.

Our findings indicate that many critical questions remain to be addressed concerning equity, poverty alleviation, and strategies for pro-poor economic growth in the transfer of the smallholder irrigation schemes from government to farmers' associations. Unresolved issues include the following: Should plots on the schemes be redistributed to assure wider access to them as an equity and poverty-alleviation measure? Should a household's other landholdings, particularly valuable wetland and streambank gardens, be taken into account if reallocation of plots on irrigation schemes were to take place? Should redistribution of scheme plots continue during the dry season as one means to broaden access? Or is pro-poor economic growth best served by permitting greater plot concentration? At this point, it appears that the Domasi WUA Executive Committee and the new Likangala SMC have adopted different positions on equity and poverty-alleviation issues – with the Domasi Executive Committee focusing on productivity and permitting greater concentration of plots and

the Likangala SMC opting for more equitable distribution of them. Our findings indicate that many plot holders on the two schemes are not fully aware of these directions and may not support them.

The study also indicates that a number of forces are at work, both on and off the schemes, which may increase plot concentration. Overall, irrigation plots have grown in value in recent years as a result of various factors. As population growth has given rise to greater land pressure, the value of lands on which two or more crops a year can be grown has escalated. The increasing irregularity in the local climate, characterized by droughts and floods, may also contribute to the importance of scheme and wetland plots. The growing market for rice and off-season vegetables in urban and peri-urban areas has increased the worth of these lands as well. More recently, new agricultural programs, including the promotion of treadle pumps and the Targeted Inputs Program, have made access to these lands more lucrative.

Factors operating on the schemes themselves also may contribute to plot concentration. WUA membership and annual plot fees are presently very low. At Domasi, each farmer is required to pay a MK100 membership fee and a MK50 plot fee per year. At Likangala, the fee is MK150 per plot per year (in July 2004 US$1.00 was equivalent to MK106). The costs of maintaining the schemes are likely to rise significantly after transfer. In the first place, the draft Water Law states that the irrigation schemes must have water abstraction permits. The cost of the water permit itself may more than triple in price in the near future, an expense likely to be passed on to farmers (Mott MacDonald, 2003). Irrigation schemes may be expected to purchase and install water gauges and other water use monitoring devices. Records of water use will have to be produced yearly at the time water abstraction fees are paid. Second, it is not clear who will pay for future major repairs to canals and headworks on the irrigation schemes – the government or the farmers' associations? Third, personnel may have to be hired to carry out at least some of the responsibilities presently assigned to elected scheme committees and sub-committees, as some of these are nearly full-time tasks and others require specialized knowledge. Membership and other fee collection may be difficult and time consuming. These growing costs will affect farmers differentially. Poorer ones may not be able to cope with them, particularly if the scheme marketing and credit facilities are not substantially improved. In sum, these are enormous adjustments that many farmers we interviewed were not aware of or did not feel ready to undertake, as the refrain "if government failed, how are we to succeed?" indicates.

Another key finding that emerged from the research is the lack of knowledge and understanding among officials and farmers alike about the irrigation, land, and water reforms, due in part to their recent origin. Domasi Irrigation Scheme was last slated for transfer to the Water Users' Association in September 2003. Yet, at that time farmers had no clear understanding of what their rights to land or water resources would be once transfer was accomplished. No common understanding existed among farmers concerning key issues of membership requirements in the WUA; tenure status of the scheme; whether plots could be bought, sold, rented, borrowed, or inherited; and if there would be a limit on the number of plots allowed farmers. At this point, rather than being more secure, farmers' rights to land and water resources are more uncertain than they were in the past.

Women's rights are particularly precarious. As noted above, both irrigation schemes are located in an area of matrilineal inheritance, and many women are plot holders. The new land policy and law state that customary lands are to be registered as "customary estates." While the final details of the implementation of the land policy and legislation are still to be worked out, the current intent is to ignore customary forms of inheritance, whether matrilineal or patrilineal, and to allow landholders to designate their own heirs. Landholders will be able to register land either as individuals or families (conjugal unit) or as larger kin-based groups, but it is unclear whose name/names will be recorded on titles. If farmers have upland, rainy-season fields in addition to irrigation schemes plots, as is the case with most of the Domasi and Likangala smallholders, will the customary estate include both types of property? At Likangala it is not yet clear what will happen to plots registered in a woman's name when the husband also has plots and the number exceeds the total of four permitted for families by the new constitution. At minimum, to avoid women losing the land assets they currently control, registration of family land should require the names of both spouses, and kin-based land should require the names of all siblings.

Features of the new water policy that have implications for the irrigation sector include the need to identify and establish institutions for water planning and conflict resolution at a scale and a cost that is realistic in the Malawian context. No sustainable funding mechanisms have yet been identified for the seventeen large-scale

river basin or catchment authorities proposed in the water policy. Governance structures at a smaller, watershed scale are needed, which would allow for water use planning and resolution of disputes in areas where water competition is intense. In our research area, as the irrigation schemes are renovated and capture more water, competition over this resource may intensify, as surrounding wetland and streambank garden users, estate owners, Lake Chilwa fishermen, birds, and other wildlife all rely on the same water sources. Competition between the irrigation schemes and other upstream and downstream users has already developed, especially along the Likangala River (Mulwafu and Khaila, 2004; Ferguson, 2002). One possibility to explore is to integrate watershed management into the new land management groups proposed in the land policy.

While the water policy and draft law, similar to others in the Southern African region, recognize people's right to water for "primary" purposes, in its present form Malawi's draft law requires those who use water for productive purposes to acquire a water use permit. The high levels of poverty plus the high transaction costs involved in collecting fees from millions of smallholders suggest that other options should be explored. One option to consider is to legally recognize a smallholder right to water for productive as well as domestic purposes. This legal recognition would take into account the importance that water plays in livelihood strategies and would grant smallholders a voice in deliberations over water use without having to register and collect fees from all of them – an impossible task in any case. Registration and collection of water permit and use fees can best be concentrated on large volume water users (ECOM, Water Boards, private estates, etc.).

Finally, consideration should be given to broadening the scope of the new water users' associations. Experiences from elsewhere in the world with irrigation transfer suggest it is most successful on schemes that have relatively small numbers of plot holders with larger plot sizes who depend on the schemes for most of their livelihood and where the costs of scheme management are a small proportion of income. Fewer numbers of better-off farmers are easier to organize and monitor, and they are more likely to be willing and able to shoulder the costs of running the schemes. While Domasi and Likangala farmers do rely on the schemes as their major source of livelihood, few of these other conditions prevail. Thus, even if the ambiguities surrounding farmers' rights and governance structures were resolved and the favoritism and corruption described above were eliminated, many challenges to successful irrigation management transfer would remain.

Shah et al. (2002) have argued that if irrigation management transfer in Africa is to be more than a means of "getting irrigation off the back of governments," it must be part of a broader strategy to remove capital, input, and marketing constraints and to enhance economic returns to smallholder farming. Domasi and Likangala farmers identified low prices and inability to negotiate effectively with buyers as two of their greatest problems. To date, however, the farmers' associations have focused on physical repair and management of the schemes, and have not addressed these broader production and marketing issues. If farmers' organizations addressing these wider production and marketing constraints were formed, it might yet be possible for poor farmers – who still form the majority of scheme plot holders – to significantly improve their livelihoods and for pro-poor economic growth to take place. Such organizations could include not only irrigation scheme farmers but also smallholders from the surrounding wetland areas who face similar constraints.

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A framework to integrate formal and informal water rights in river basin management

Bruce Lankford and Willie Mwaruvanda

The paper explores a water management framework for bringing together formal water permits and informal water agreements to effect intra- and inter-sectoral water allocation. This framework is based on setting and modifying seasonally applied volumetric and proportional caps for managing irrigation abstractions and the sharing of water between users and sectors in river basins. The volumetric cap, which establishes the upper ceiling of irrigation abstractions in the wet season, relates to formal water permits and maximum intake capacities. The proportional cap, which functions in the dry season beneath the volumetric ceiling, builds on customary water negotiations and on the design and adjustment of intakes by users. The analysis is informed by conditions found in the Great Ruaha River Basin, Southern Tanzania, where rivers sequentially provide water for irrigation, a wetland, the Ruaha National Park, and for electricity generation. A working example of the framework helps explain its effect on inter-sectoral re-allocation.

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Keywords: water management, interfaces, formal, informal rights, irrigation intakes

Introduction

To change the distribution of water between sectors in river basins needs the resolution of three matters; establishing a vision of water allocation (river basin objectives for who gets what water); creating and sustaining the physical, legal, economic and institutional means of distributing water according to this vision; and monitoring outcomes so further adjustments can be made to both vision and means. Of these three, the most difficult is the second, requiring the deployment of a water governance architecture that utilises various allocation devices, involves and recognises many stakeholders, accommodates issues of scale and timing and is underpinned by an appropriate legal and institutional framework. With regard to the latter; the gaps, overlaps and contradictions occurring between formal and informal legal agreements that fit within that architecture pose particular problems. Arguably, this is the key challenge for integrated water resources management in Tanzania (Sokile, 2003), and how this challenge might be met is the subject of this paper.

Although theoreticians may articulate ideal legal and institutional frameworks, in reality such frameworks commonly suffer from incongruities that exist between institutional functions, practices, objectives and biogeographic properties (Moss, 2004). Water frameworks have to help achieve river basin objectives, work within the limitations imposed by inherent conditions, fit other economic and infrastructural devices, and often build on existing progress made. The scope for re-thinking a wholly new institutional matrix may be severely restricted. In this regard, this paper's contribution builds on existing legislation in Tanzania. Furthermore, systemic challenges also exist: for example, research may point to the benefits that local user agreements can play at the local level, but how do we ensure that local user agreements collectively result in large-scale and bulk-water re-distribution, and how should local agreements that may operate well at the irrigation level be applied to the catchment level? If informal arrangements are not carefully dovetailed into higher-level formalities and other allocation devices, new legislative and institutional frameworks will probably only partially succeed.

The paper explores a framework that aims to fit together legal, institutional and infrastructural water management provisions, recognizing the synergy between different components of water management, building on present-day policy directions and acknowledging contextual properties and processes (Velasco, 2001). The framework emphasizes the division of water management into wet and dry seasons, arguing that formal water rights have a role in the wet season, and that customary or local water agreements relate better to conditions found in the dry season (though clearly a variety of on-going discussions and consultations are required throughout the year – this is not to propose a mutually exclusive division). The two key assumptions

here are that formal rights relate to access to water quantities measured by a flow rate (e.g. litres/second) and that customary agreements relate to access to water quantities described by an approximate share of the available water (e.g. "about half of what is present in the stream"). The assumptions are valid because formal rights are denominated in volumetric terms while customary agreements in their original form (an important distinction since customary rights can be transmuted during formalization procedures into volumetric measures) are founded on a notion of access to an (unmeasured) quantity of water, combined with the notion that not all the water can be abstracted from a stream or irrigation channel (Gillingham, 1999; SMUWC 2000). Therefore customary agreements, for the purposes of this paper, pertain to negotiations over water *shares* that theoretically range from 0% (no water is abstracted) to 100% (all the water is abstracted) of the available water, with the observation that streamflows are divided by trial using proportionally-based intakes rather than by measuring flow using gauges, weirs and adjustable gates.

The framework explicitly designs other dimensions around the wet/dry season separation to assist rather than undermine these legal pluralisms and water re-allocation objectives. This fits the call by Maganga et al (2003) for an approach that "combines elements of RBM and customary arrangements at the local level". The framework is not a classification framework such as proposed by Meinzen-Dick and Bakker (2001) who examined rights associated with different water purposes. The proposed arrangement here concerns mainly agricultural productive use of surface water that also meets domestic purposes in villages within the command area. It should be emphasized that the paper (which utilises research from two projects - SMUWC[1] and RIPARWIN[2] - that have studied river basin management in the Great Ruaha River, part of the larger Rufiji Basin) is exploratory in nature, and does not represent policy advice at this stage. The paper also briefly discusses some concerns related to the sustainability and workability of the new arrangement.

River basin management initiatives in Tanzania

The Rufiji and the Pangani are two basins that have been supported by the Ministry of Water and Livestock Development (MOWLD) and a World Bank Project (RBMSIIP) to manage water at the river basin scale via the establishment of river basin offices (RBO's). Although detail on these projects is available elsewhere (Maganga, 2003; World Bank, 1996), two[3] key activities of the Basin Offices are described here.

Formal water rights

Water for irrigation is managed via the issuance of formal water rights ('permits') to water users against the payment of an annual fee that are expressed in quantitative flow units (e.g. cumecs) (Mwaka, 1999). Associated with this is the registering of users and establishment of water user associations as legal entities. Maganga, (2003) outlines the new thinking in the Water Policy (MOWLD, 2002) that has been part incorporated into the new Water Strategy (MOWLD, 2004) which aims to regulate water use on the basis of statutory legal systems. Therefore, formal water rights are the key means for achieving redistribution in Tanzania (World Bank, 1996). However, as Maganga points out, law-making to date has not recognised the role that customary agreements play at the local level, though space for customary agreements is given in the new putative legislation and therefore a future activity will be to incorporate customary arrangements in ways that fit the rubric of the new legislation.

Recent research (Lankford et al., 2004; van Koppen et al., 2004) supports the view that customary rights have not been fully recognised, and in addition, shows that the formal statutory rights may be structurally flawed in three ways; firstly payment for water is not related to volume used, and so they may not dampen demand, as they are supposed to do, but instead help increase demand. This lack of fit relates to discrepancies between the water permit abstraction rate and the designed intake abstraction rate as is explained below. Secondly, they mainly address water availabilities found in the wet season rather than the dry season when important re-distribution objectives are equally, if not more, critical. According to the RBWO, there is a nominal 50% reduction in the water right during the dry season, but this too is not against measurement, and does not relate to the real proportional decreases found in river flows which are closer to 10% of the wet season flows. Thirdly, they demand high levels of supervision that are not commensurate with resources available to the basin authorities.

Discussions with the Ministry of Water and Livestock Development seem to indicate that there is no plan to change the policy on the use of statutory rights, and that water permits will continue to be issued. That said, the RBWO has recently been requested by its Board to review the current status of permits already issued with a view to bringing them into line with water availability. An appropriate accommodation of customary

agreements might be highly beneficial as research (Gillingham, 1999; SMUWC, 2000) shows that in parts of the Great Ruaha Basin, local users negotiate and share river flows at the irrigation system level and sub-catchment scale.

Irrigation improvement programmes

Where identified, smallholder irrigation systems have had their intakes upgraded from traditional construction (e.g. stones and mud) to that of a concrete and steel gate design. Theoretically this allows some improvement over control and the possibility that water flows can be measured – and has long been thought to raise irrigation efficiency (Hazelwood and Livingstone, 1978). However, in many cases, these structures enable dry season flows to be completely abstracted without allowing the passage of any downstream compensation flows, are unable to affect internal water management and efficiency, and in all cases water measurement is missing (Gowing and Tarimo, 1994; Lankford, 2004a). Upgrading of intakes and improvement of water control at the intake are commendable objectives – however it is the end purpose that should be re-thought. As this paper argues, there is a case for designing improved intakes so that they work in harmony within a catchment rather than solely for the irrigation system in question (Lankford, 2004b).

Case study description

The Great Ruaha River Basin is found in Southern Tanzania. Previous articles, to which the reader is referred, describe in detail the geography of the area (Baur et al., 2000; Franks et al., 2004). Some of the conditions relevant for this analysis of river basin initiatives (described in the next section) are as follows:

- The size of the sub-basin (68,000 km^2) poses logistical problems for managing water by formal rights alone that require monitoring and policing. To reduce these costs and to manage conflicts at the sub-catchment scale requires robust forms of subsidiarity.
- The basin experiences a single rainy season (of about 600-1000 mm average depending on climate and altitude). Rivers swell during this period, but shrink dramatically during the dry season between May and November, a period that suffers from water stress and conflict. This considerable dissimilarity in water availability and associated dynamics suggest that the wet and dry seasons need different forms of management, and that in particular the dry season necessitates special care.
- The area lacks an aquifer or any large-scale storage that can support irrigation (although the downstream hydro-power has storage). Irrigation has to rely on run-of-river supplies, and this points to the need to manage surface water resources carefully without the benefit of storage buffering.
- There is competition between the sectors of rice irrigation, a RAMSAR wetland, the Ruaha National Park, and hydropower in both wet and dry seasons, although this is not on the scale of the competition envisaged under the RBMSIIP programme (Machibya, 2003). In addition the policy for the river, 'restoring the all year-round flows of the Great Ruaha River'[4], presents a specific goal by which river basin management can be tested. During a normal year, competition is mainly found during the dry season but is impacted upon by wet season abstractions that make it more difficult to throttle demand during the dry season. This, combined with the changeable climate that brings shortages during the wet season, means that water management is required throughout the year. Furthermore, the authors argue that purposive decisions over inter-sector allocation should replace the *ad hoc* unplanned change in distribution that has arisen within the last 30 years and may continue in the future.

The challenges ahead

Reviewing the discussion above, we see that there are a number of concerns for water management in the basin:

- To build on the water rights currently provided so that they help achieve river basin objectives.
- Another aim would be to improve the system that caters for both the wet and dry seasons, and that manages the switch in water availability and demand between the two seasons.
- A further objective would be to draw up an arrangement that incorporates without conflict both formal and customary agreements.
- In addition, it is necessary to draw together the water permits with the infrastructural works so that these match, and together fit the hydrology of the catchments in question.
- That the National Water Policy is implemented effectively especially with regards to its institutional framework.

The paper aims to answer these concerns and the call by Moss (2004) for "creating better fit" (p 87) between institutions and other components, and is a contribution to the request in the Water Policy Paper (MOWLD, 2002; 28-29) "Thus the legislation needs to be reviewed in order to address the growing water management challenges". It should be emphasized that the paper does not seek to select and set a distribution of water scarcity but to show a means of how available water might be shared between sectors. In addition, the framework described here is relevant in other closing and closed river basins such as the Pangani in Northern Tanzania.

Inter and intra sectoral water allocation - definitions and theory

Because irrigation is the major upstream water abstractor in the basin, it is the main determinant explaining the share of water within this sector, and between this sector and downstream sectors. Simply put, water for downstream users is the remainder after irrigation abstraction has occurred (following the observation that return flows of drainage water are a minor proportion of abstracted flow or are accounted for). This relationship is captured in Figure 1 and is explained here. The abstraction flow-rate to feed a single irrigation system is a function of four factors (see Equation 1); the design of the intake capacity; the number of irrigation intakes feeding that system; any operation of these intakes that adjusts their discharge; and the flow of water in the river which affects the head of water at the intake. Intake design incorporates a stage discharge relationship between intake flow, orifice size and head of water at the weir so that for most intakes, without adjustment, intake flow increases as the river flow increases. As has been shown by Lankford (2004b), the intake rate is a function of supply rather than of responding to changes in irrigated area or of crop water demand, except when intakes are throttled to safeguard fields from extreme and rare damaging floods.

Equation 1: Q (single irrigation system) = f [intake design, intake number, intake operation, supply in river]

By simple mathematical balance, the flow for downstream irrigators is the remainder of the river flow once upstream intake abstraction has occurred (see Equation 2 and Figures 1 and 2).

Equation 2: Q (downstream irrigator intake) = (Q river supply – Q upstream intake)

The flow of water being abstracted into the irrigation sector (a summation of all intakes within a catchment) is a result of the river supply and the total intake capacity combined with any cumulative effect of operational decisions (Equation 3):

Equation 3: Q (total irrigation) = f [all intakes design, number of intakes, cumulative operation, river supply]

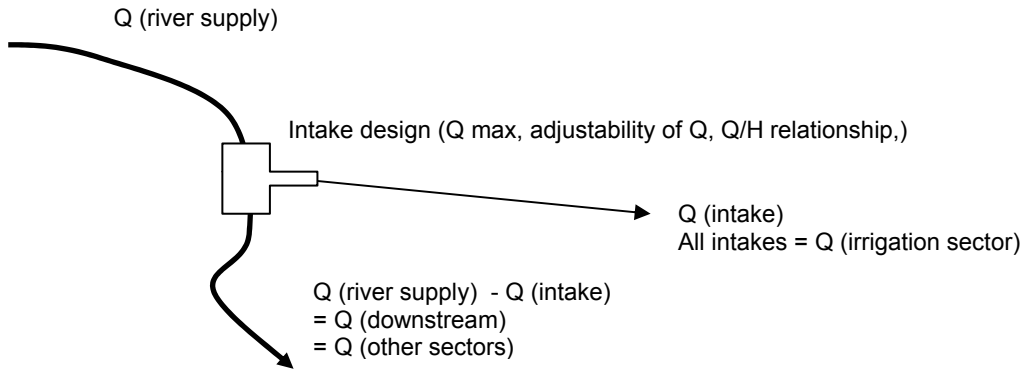

Figure 1. Irrigation abstractions establishing downstream allocation

Source: Authors

When applied to 'between sector' computations (Equation 4); it is the cumulative irrigation abstraction within a catchment that determines the water available for downstream sectors.

Equation 4: Q (other sectors) = (Q river supply – Q total irrigation intake)

Over one year, abstraction fluctuates as a result of the four factors, creating an abstraction pattern or hydrograph (Figure 2), which follows the river supply hydrograph with greatest abstraction during the wet season and lower abstraction in the dry season. Plus, a hydrograph can also be generated for a large river from individual hydrographs arising from management practices on tributaries converging into a single river. Via mathematical continuity, the pattern of intersectoral allocation will also be a function of the irrigation abstraction pattern. (Figure 2 is further explained in the discussion below on volumetric and proportional caps). It follows we can determine a simple indicator of river basin management; the 'irrigation allocation ratio' (IAR) of irrigation abstraction to total supply (Eq. 5), a measure of the equity of distribution between irrigation and other sectors. A figure of about 50% indicates that water is evenly divided between irrigation and other sectors, while an IAR of 90% tells of a highly skewed supply to irrigation.

Equation 5: Irrigation allocation ratio, IAR = (irrigation abstraction) / (upstream supply flow)

Volumetric and proportional caps

To manage the irrigation abstraction ratio in Equation 5 requires an understanding of intake design and operation. Figure 2 and the 2 x 4 matrix in Table 1 summarize the strategic tasks of setting two types of 'ratios' (other terms used in the paper are 'thresholds' or 'caps') that affect the irrigation allocation ratio (IAR). These two thresholds relate closely to the properties of intake structures and to the season, and it is important to note that this model is supply rather than demand driven because of the points argued in equations 1 to 5. The first threshold (left-hand column) termed here the volumetric cap is determined by the maximum volumetric capacity of the intake, or 'Q max'. This cap, it is argued, applies during the main part of the wet season when river flows are larger. Figure 2 shows this as a *fixed plateau* on each intake hydrograph where the maximum intake capacity stops more water from being abstracted. Note that the height of the cap plateau is only set from the zero on the Y axis for the first intake, but for the others, the level is set by counting up from the previous intake plateau.

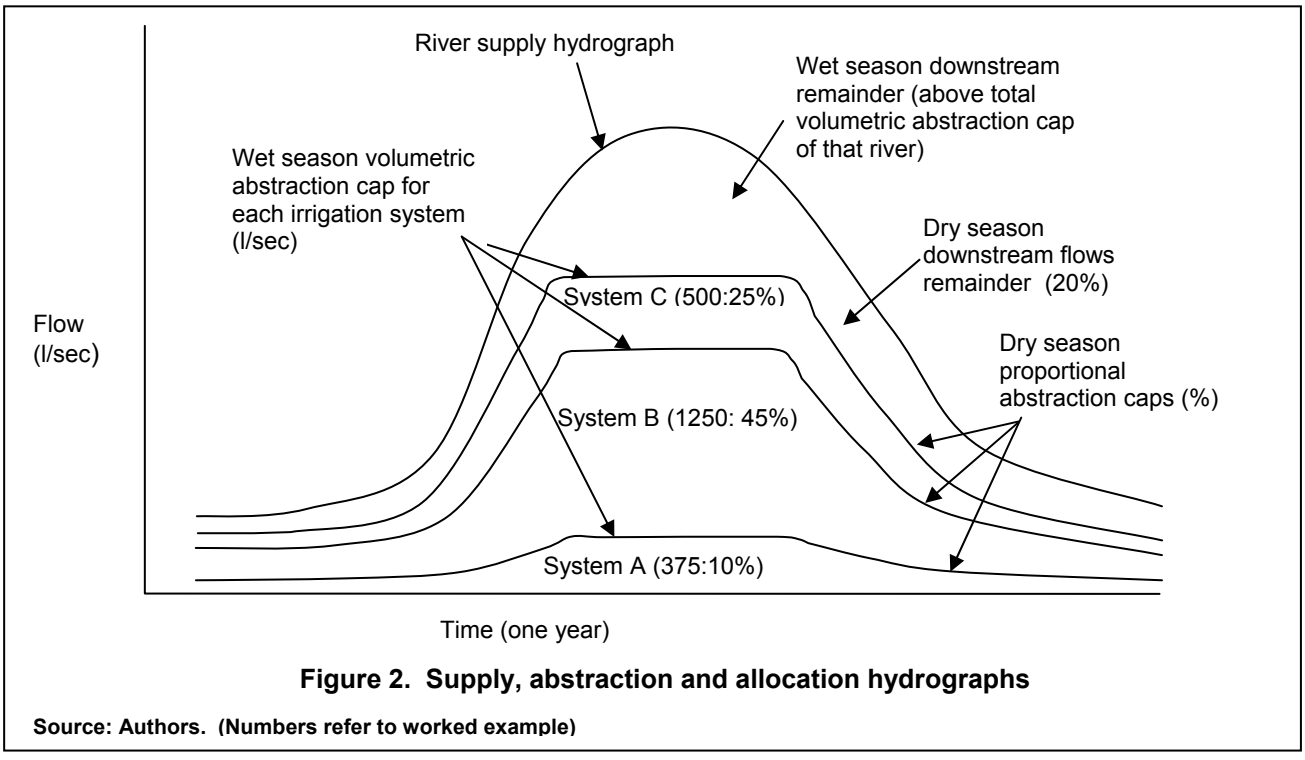

Figure 2. Supply, abstraction and allocation hydrographs

Source: Authors. (Numbers refer to worked example)

The second threshold (right hand column in Table 1) is the proportional cap. This cap, or ratio, sets the proportion of supply that is abstracted when river supply is less than maximum intake capacity. This applies to those periods of the hydrograph when the river flow is low (i.e. the beginning and ends of the wet season and during the dry season). Figure 2 shows this as a *proportional* change in abstraction as the supply hydrograph increases and decreases.

Referring to Table 1, there are two main ways of managing the IAR in both wet and dry seasons. The first is to build in *manageability* so that the design of the intakes assists in arriving at these distribution targets and relate well to institutional decisions and reforms. The second is to rely on *management* to persuade water users to frequently regulate any infrastructure so that these adjustments generate the intended outcomes. Regulation involves adjusting and closing intakes so that downstream flows are altered, or scheduled against time windows (i.e. one day for this intake, one day for the next intake and one day for the environment, etc). Either way, the aim is to ensure that over a given period of time each intake (or user or sector) receives a given portion of the available water providing the remainder for downstream sectors. The authors argue in this paper that the former approach – building in manageability – is the more appropriate as this assists users in negotiating over water.

Table 1. Proposed relationships between caps, design, operation and formal water rights

	Volumetric ratio or cap	**Proportional ratio or cap**
Season	Wet season	Dry season
Design	The design of the maximum capacity of the intake is a critical step, and will generally establish the maximum volumetric cap.	Maximum capacity is often above dry season river flows so operation is needed to affect the division of water between irrigation and other sectors during this period (See row below). Design can be used to implement proportional divisions (using fixed proportional gates).
Operation	It is unlikely that operation alone will reduce the maximum water abstracted, and thus the design of the maximum abstraction is very important (see row above).	Further adjustment of the intakes may be necessary to reflect on-going negotiations, but if fixed proportional dividers are well designed this need not be a regular or onerous activity.
Legal	Theoretically, the design fits the water permit or users adjust their intake to fit the water permit. (Note: The water rights as currently provided by GoT are volumetric in nature and pertain to high flows during the wet season).	The water rights as currently provided do not encourage users to adjust their water abstraction in a proportional manner.

Design affects the 'Q max' and adjustability of the intake discharge. 'Q max', the maximum discharge when orifices are fully open and head-adjusting structures are set to maximum, is an important design parameter because users tend to default to this setting – meaning gates are normally opened to their maximum. This is the reason why when the rivers are in peak flow, intakes tend to take the maximum flow they can, and why in the dry season intakes tend to abstract all the available water. (As well as being more likely to be washed away, according to custom, traditional intakes could not be built to block the whole river; Gillingham, 1999). 'Adjustability' is designed by considering how the orifice can be set at partial settings and how any head-controlling structure such as a weir can be adjusted. The actual operation of this gate is then the adjustment of the intake flow either by closing and opening the orifice gate, or by increasing or decreasing the height of any weir structure. It is this adjustability that also explains why in the wet season farmers will throttle down their intake when very high floods threaten their systems, and why in the dry season, negotiations between upstream and downstream farmers can be physically transformed into gate adjustments that release water downstream.

Although design and operation of the design is the *de facto* determinant of abstraction, adjustments could be influenced by the volumetric water rights specified to irrigators. This is expressed in the last row of Table 1. The theory is that the water permit/right either directly relates to the maximum capacity of the intake or the intake can be very easily adjusted to meet the right. In Usangu however, water rights do not relate closely to design capacity, and water-measuring facilities are rare. Therefore, the water rights, as currently conceived

do not correlate to the design or to the operation of that design. Thus, at the moment, it is the intake design rather than water rights that establish abstraction patterns during the wet and dry seasons.

Water allocation management – readjusting the caps

Building on the previous section, we now discuss how to manage water allocation by using and modifying the volumetric and proportional caps. To discuss these changes requires us to unpack existing and future 'modified' objectives for both the wet and dry seasons, creating four cases to consider (Table 2 and Figures 3 to 6).

Table 2. Moving from existing to future visions of water distribution

	WET Climate season	DRY
Existing OR modified intra- & inter- sector distribution	Case 1. Wet season, existing intra/inter sector distribution of water. (Volumetric cap)	Case 3. Dry season, existing intra/inter sector distribution of water. (Proportional cap)
	Case 2. Wet season, future modified intra/inter sector water distribution. (Volumetric cap)	Case 4. Dry season, future modified intra /inter sector water distribution. (Proportional cap)

Case 1. Wet season, existing intra- and inter-sector distribution of water

Case 1 explains the existing distribution of water in the wet season. For intra-irrigation distribution, the division of water between intakes changes as the flow capacity is exceeded upstream by ever increasing flows. Once the wet season is in full flow, each intake accepts its own maximum intake flow, so that unless adjusted, the between-intake distribution is function of intake design. With respect to inter-sector allocation, when supply exceeds abstractive capacity, downstream supply is the remainder of the flow below the last intake and is therefore a function of the total river supply minus the total abstractive capacity (see Figure 3). For example in the year 2000, SMUWC found that about 45-50 cumecs was the maximum capacity. Once this was exceeded, then water would flow to the Usangu wetland and then on to the Ruaha National Park and the hydropower stations.

Case 2. Wet season, modified intra- and inter-sector distribution of water

To adjust or modify the intra-sector distribution of water, the abstraction capacities of individual intakes need to be revised. As Figure 4 shows, to alter intersectoral reallocation, the maximum total intake capacity needs to be revised downwards to 'force' excess water downstream to other sectors. This means bringing in a new volumetric cap. For Usangu, this might be determined on the basis of observations and modeling, and for example might be set at 50 cumecs, which although may be above the level of year 2000, it is below the potential level of 60 cumecs that might occur in the years 2005-2007.

Case 3. Dry season, existing intra- and inter-sector distribution of water

Case 3 explains existing patterns of water distribution in the dry season. In the Great Ruaha Basin, the upgrading of intakes has resulted in some taking all of the dry season flow because further adjustment is relatively rare. Thus, the intra-irrigation sector distribution is highly skewed to the improved intakes found in upstream locations. For intersectoral division of water, if supply is less than demand, then downstream supply is a function of the share between upstream irrigation and downstream users. From observations (SMUWC, 2000), we see that currently (in the dry season) the proportional cap is about 90 to 100% - in other words until the abstraction capacity was exceeded by flood water, nearly all the water was taken by irrigation in those catchments with irrigation. As Figure 5 shows, this means minimal or zero flow for downstream sectors.

Case 4. Dry season, modified intra- and inter-sector distribution of water

To alter water distribution during the dry season requires the partial closure or redesign (or both) of intakes so that less water is abstracted (Figure 6). A mixture of both modeling and local user agreements would feed into the process of negotiating the proportional cap, which if reduced brings compensation waters for other sectors. In Usangu, discussions on a modified proportional division between irrigation and downstream sectors are underway in some sub-catchments, which range from approximately 35-90%.

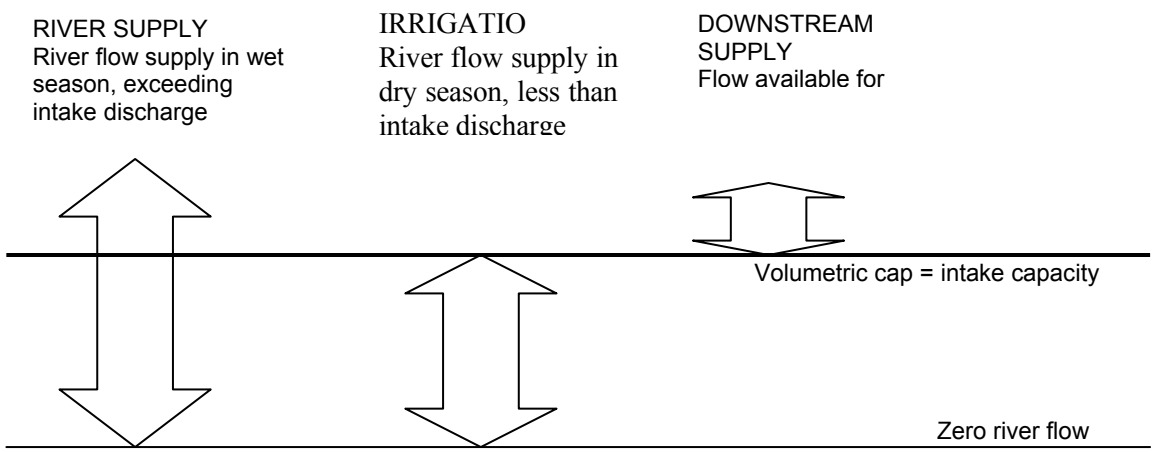

Figure 3. Wet season. Current volumetric cap

Source: Authors

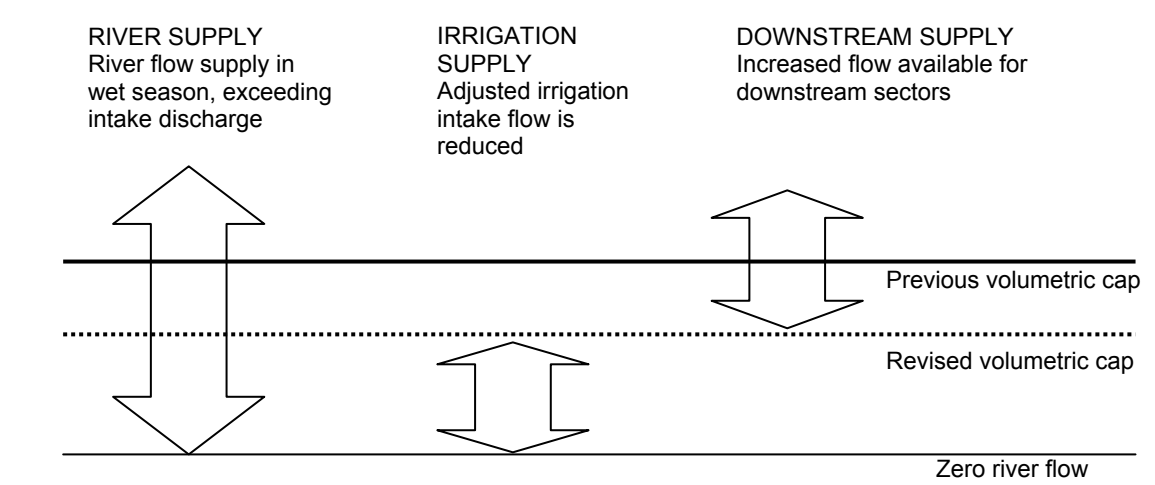

Figure 4. Wet season. Revised volumetric cap

Source: Authors

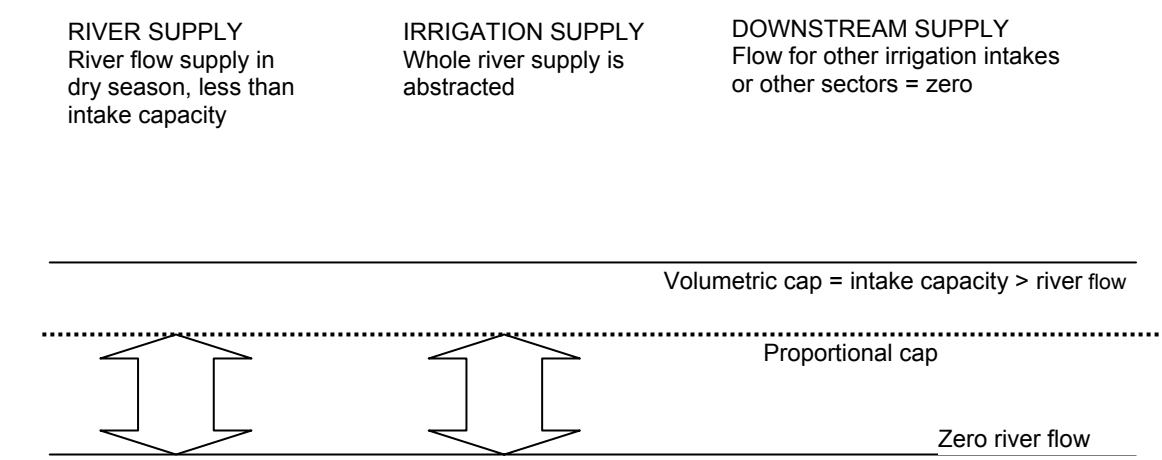

Figure 5. Dry season: High proportional cap

Source: Authors

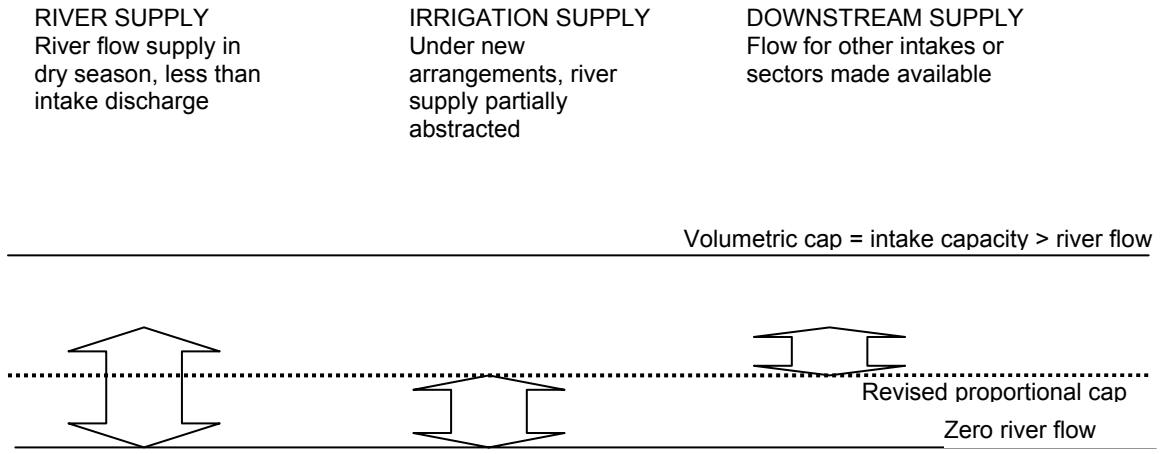

Figure 6. Dry season: Revised proportional cap

Source: Authors

Worked example

A worked example enables us to see how the volumetric and proportional caps work. This is explained in Table 3 and Figures 2 and 7. Three intakes feeding irrigation systems A, B and C are located in a single sub-catchment. The current design allows a maximum of 500, 2500 and 800 l/sec respectively, giving a total sectoral abstraction of 3800 l/sec (see Case 1 in Table 3). During the dry season when this flow is not exceeded (Case 3), then the share between A, B and C is 15%, 50% and 30%, providing 5% for downstream sectors. Under the modified arrangement, the volumetric caps are reduced (Case 2), giving 375, 1250 and 500 l/sec respectively (giving a total sub-catchment permit of 2125 l/sec) and when water does not exceed this volume, the share between A, B and C is 10%, 45% and 25%, providing 20% for downstream (Case 4).

The results of the shift in shares can be seen in Table 4. For example in the first three 10 day periods of September, part of the dry season in this part of Tanzania, the downstream flow has increased from about 8 to 13 l/sec up to 30 l/sec to 50 l/sec. In the middle of the flood season, say February, the remainder flow has increased from 5200-6200 l/sec to 6800 to 7800 l/sec. In annual volumetric terms, the amount of water diverted for irrigation has decreased by 29352 MCM (million cubic metres) from 75062 MCM to 45710 MCM, a drop of 39%. The same amount of water going downstream of 29352 MCM represents a 56% increase on the pre-modified situation. Calculation of the irrigation allocation ratio (IAR) indicators shows that the revised caps decreased irrigation impact on the hydrology of the catchment from 56% to 36%.

Table 3. Existing and modified settings for volumetric and proportional caps (worked example)

	Volumetric Cap Units (cumecs)		Proportional Cap (Percentages)	
Case	1 (Wet season, existing)	2 (Wet season, modified)	3 (Dry season, existing)	4 (Dry season modfied)
Irrigation system A cap	0.50	0.375	15%	10%
Irrigation system B cap	2.5	1.25	50%	45%
Irrigation system C cap	0.8	0.5	30%	25%
Volumetric (cumecs) and proportional cap (%) for irrigation	3.8	2.125	95%	80%
Remainder for downstream	Remainder	Remainder	5%	20%

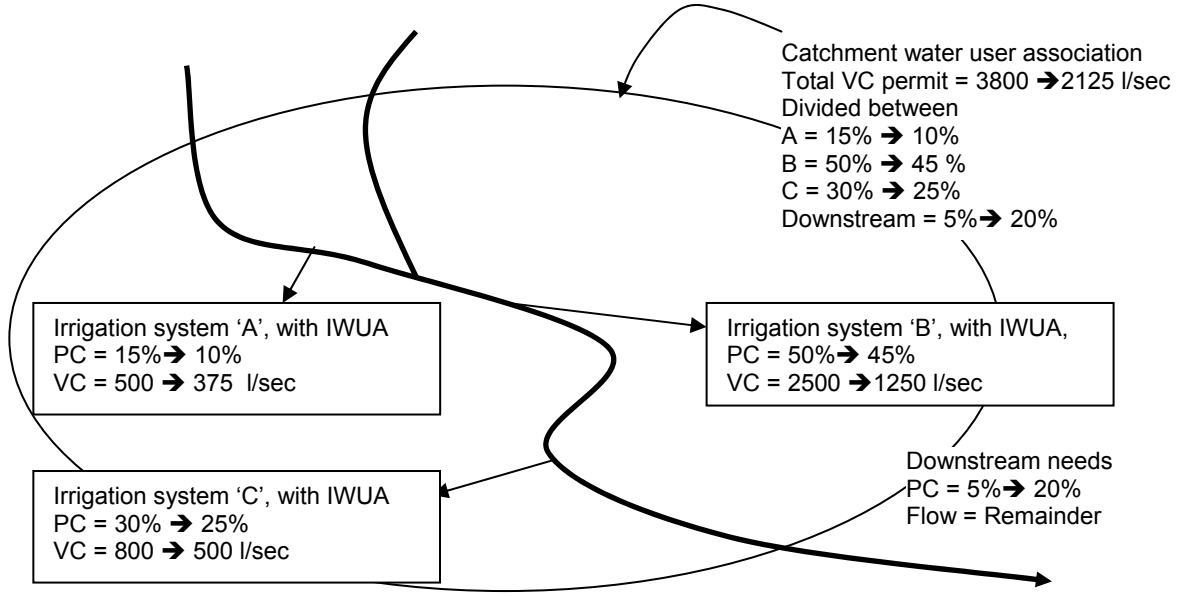

Figure 7. Volumetric and proportional caps applied to irrigation systems

Source: Authors

It is interesting that the downstream share benefited greatly from only slight reductions in each irrigation system's abstraction. This was particularly noted in the dry season, and is a result not only of the relative starting points of each sector, but the fact that three intakes were involved in releasing water. In effect, each only needs to give a 5-10% compensation to result in 15% to 30% extra water flowing downstream.

Table 4. Simulation of revising caps for modelled catchment (units = l/sec)

Dekad	River supply	Existing distribution pattern				Modified distribution pattern			
		Irrig. A	Irrig. B	Irrig. C	Remainder	Irrig. A	Irrig. B	Irrig. C	Remainder
Sep 1	150	23	75	45	8	15	68	38	30
Sep 2	200	30	100	60	10	20	90	50	40
Sep 3	250	38	125	75	13	25	113	63	50
Oct 1	300	45	150	90	15	30	135	75	60
Oct 2	400	60	200	120	20	40	180	100	80
Oct 3	500	75	250	150	25	50	225	125	100
Nov 1	700	105	350	210	35	70	315	175	140
Nov2	900	135	450	270	45	90	405	225	180
Nov 3	1500	225	750	450	75	150	675	375	300
Dec 1	1900	285	950	570	95	190	855	475	380
Dec 2	2600	390	1300	780	130	375	1250	500	475
Dec 3	3900	500	2500	800	100	375	1250	500	1775
Jan 1	5600	500	2500	800	1800	375	1250	500	3475
Jan 2	7800	500	2500	800	4000	375	1250	500	5675
Jan 3	8000	500	2500	800	4200	375	1250	500	5875
Feb 1	9000	500	2500	800	5200	375	1250	500	6875
Feb 2	10000	500	2500	800	6200	375	1250	500	7875
Feb 3	10000	500	2500	800	6200	375	1250	500	7875
Mar 1	9000	500	2500	800	5200	375	1250	500	6875

Dekad	River supply	Existing distribution pattern				Modified distribution pattern			
		Irrig. A	Irrig. B	Irrig. C	Remainder	Irrig. A	Irrig. B	Irrig. C	Remainder
Mar 2	8500	500	2500	800	4700	375	1250	500	6375
Mar 3	8200	500	2500	800	4400	375	1250	500	6075
Apr 1	8000	500	2500	800	4200	375	1250	500	5875
Apr 2	7500	500	2500	800	3700	375	1250	500	5375
Apr 3	7000	500	2500	800	3200	375	1250	500	4875
May 1	6500	500	2500	800	2700	375	1250	500	4375
May 2	6000	500	2500	800	2200	375	1250	500	3875
May 3	5000	500	2500	800	1200	375	1250	500	2875
Jun 1	4500	500	2500	800	700	375	1250	500	2375
Jun 2	4000	500	2500	800	200	375	1250	500	1875
Jun 3	3500	525	1750	1050	175	375	1250	500	1375
Jul 1	3000	450	1500	900	150	375	1250	500	875
Jul 2	2000	300	1000	600	100	200	900	500	400
Jul 3	1000	150	500	300	50	100	450	250	200
Aug 1	200	30	100	60	10	20	90	50	40
Aug 2	200	30	100	60	10	20	90	50	40
Aug 3	150	23	75	45	8	15	68	38	30
MCM	127829	10297	47282	17483	52767	7698	26704	11308	82119
MCM = Million cubic metres		Irrigation total MCM = 75062			52767	Irrigation total MCM = 45710			82119
		IAR = 75062/127829 = 59%				IAR = 75062/127829 = 36%			

Synthesis: a framework of water legislation and management

We can now explore, via a framework, some synergies between the different water management, design and legislative dimensions. This framework, which expands Table 1, is presented in Table 5. Each column represents either the wet or dry season. For each season a 'water management structure' is proposed. This several-layered structure coheres the type of water threshold decision to be made (volumetric or proportional), the design of the maximum capacity, the adjustability of intakes, the type of property right (formal or informal), the level of stakeholder decision-making (river or irrigation user association) and the nature of water payment made.

Following Table 5, in the wet season, to distribute water between irrigation and downstream sectors requires first a maximum cap on abstraction. This cap is physically designed in by constructing the maximum apertures of the intakes so that no more water than this cap can be abstracted. This cap is underpinned by the formal water rights sold by the Government (requiring the current system of volumetric water rights to be improved so that this cap is set accurately and legally). In turn the legal permit relates to either individual water user associations that represent irrigation systems, or to the catchment water user association (CWUA) that represents the irrigation sector within that catchment. If the latter occurs, then the CWUA can divide up the permit to its various constituent intakes volumetrically. Either way the individual intake and total intake capacity must be expressly related to the maximum permits and managed both at the individual and catchment level. Water basin officers would then be interacting with representatives of both individual intakes and the whole catchment to iteratively ensure coherence between these dimensions.

Table 5. Framework of seasons, caps, intake design, rights and WUA's

Water governance structure	Wet season	Dry season
Type of cap	Total volumetric abstraction cap	Proportional abstraction cap
Part of intake design most closely associated with this	Maximum aperture Q max Focus = [litres/second]	Either design allows adjustability of gated intake flows or allows passive proportional abstraction of available river flow Focus = [% of division]
Part of intake operation most closely associated with this	Advised to rely on Q max rather than on throttling. Gate is opened to maximum setting	Adjustments of intakes or scheduling of water is advised.
Type of rights most closely associated with this season	Formal water permit (volumetric)	Customary agreements and rights (proportional, or time schedule basis)
Role of catchment water user association (CWUA)	Water permit to CWUA and division of permit to irrigation WUA representatives	Division of river supply agreed between users or irrigation WUA's.
Institutional connections	Basin Office to facilitate and mediate catchment water user association negotiations	Intake to Intake representatives of irrigation water user associations plus RBWO mediation
Payment structure	Fixed payment for water right	No payment for proportional share

In the dry season, on the right hand side of Table 5, new arrangements begin to operate because the designed-in maximum capacity for abstraction is now above the river supply; thus the small river supply needs sharing out between irrigators, and between irrigation and downstream sectors. This requires a maximum threshold on the share provided to irrigation. This allocation is more likely to be implemented by the regulation (partial throttling) of gated adjustable intakes but could also be 'designed in' by using proportional weir type structures (e.g. castellated weirs – see Lankford 2001). Since the 'rights' to these dry season flows are below the flow rates set by the formal rights, the dry season shares (or 'rights') have to be negotiated informally between all users in and below the catchment and then backed up by a mixture of intake design and adjustment. These latter rights would have to be articulated not in the form of flow rates (l/sec) but proportions of the water, for example 'an intake would receive 20% of the river flow water'.

The role of the river basin officer would change in the dry season when the formal permits were no longer 'active'. Greater emphasis would be placed on conflict resolution services to assist the WUA's in sharing more equitably the available water, altering the proportions of water according to changing circumstances, or encouraging stakeholders to permit more water to remain as in-stream environmental and domestic flows.

With regards to payments for water, in the current legislation, payments are for the water right/permit pegged to the allocated amount rather than the actual measured amount. This same arrangement could be applied to this framework, which therefore does not at least in the initial stages envisage a volumetric basis to determine a water charge, although this would be a future goal that various stakeholders might wish to explore. The agreements over the dry season shares do not involve financial transactions, instead being derived via discussions held within the catchment users' organization, mediated by the basin authority.

Details…

Although theoretically the framework resolves the contradictions of how formal and informal rights can operate together by splitting them into different seasons, in reality this will present some problems. It is difficult to foresee all of these complications, but four are identified here. These, discussed below, form inter-related concerns that would collectively influence the success or failure of the framework.

Setting thresholds

Setting the caps will inevitably create winners and losers as shares increase for some and drop for others. The process by which the caps are set will benefit from being participative, and informed by good quality hydrology and observations of current patterns of water use. Incremental adjustments might be advisable during different parts of the river hydrograph; indeed for the very lowest and driest part of the year, local users might agree that all water should be kept in the river with only domestic (rather than productive) quantities being tapped.

Sharp-eyed readers will have noticed that by definition the wet season begins once the total abstraction capacity of all intakes on the sub-catchment has been exceeded by river flows, and that a dry season is that time period when the river is less than this threshold. Also, the dry season is, by definition, the period when the river flow no longer exceeds intake capacity, and that negotiated customary agreements need to interject. This can be realised by setting conditions with the permits that recognize these negotiations. These definitions do not follow other ways of naming the two seasons (start of rains, or based on long-term records, or related to other farming activities). It follows that the higher the abstraction capacity the shorter the wet season until the point where total abstraction might grow to exceed all but the highest peak flows in which case throttling and adjustment is necessary nearly all the time. Clearly, the thresholds and resulting design modifications have to be set so that expectations of irrigators and other sectors match the hydrology and climate of the area.

Transparency and information

The test of the arrangement will be the switch from the wet season to the dry season, a transition period of care and attention. The switch will not happen automatically – though it could be very much assisted by a combination of *appropriate* water measurement and intake infrastructure (see below). It is possible to envisage problems with a river flow that exceeds the capacity of the uppermost intake but that has not yet exceeded the capacity of all the intakes combined. The upper irrigators will probably feel, on observing 'good flows' that it is their right to tap this water with their gate set at maximum, even though this will skew their proportion above that agreed. Key to this transition, and to the management of the arrangement as a whole, will be passive robust water measurement or transparent water division (structures that split water without the need for measurement).

Re-tuning river basin infrastructure

Central to the success of the framework will be a commitment to revising the existing intake infrastructure in each sub-catchment. A re-design programme will have to meet various objectives to promote the *manageability* of river basin management via the framework and could draw on an extensive literature based on irrigation designs (e.g. Yoder, 1994):

1. The maximum abstraction capacity, Q max, will need to be designed in, necessitating the contribution of each intake to that total to be reviewed. This also relates to the question of definitions regarding wet and dry seasons posed above.
2. Each individual intake will have to be designed so that its maximum flow relates iteratively to a number of factors; area of irrigation, crop types, re-negotiated shares (e.g. an agreement to drop one intake by 10% so this can go to another). Simply deriving irrigation intake designs on the basis of crop water requirements may not work in this highly dynamic environment (Lankford, 2004b).
3. The operability and adjustability of the intakes will need to be re-thought so that the intakes can be altered. Alternatively, it should be possible to build in proportional intakes to support proportional rights.
4. Robust and simple water flow measurement may be required so that users are able to compare between each other and to detect incoming flows in order to switch to the 'dry season' sharing agreements.

Allowing flexibility and change

It would be mistaken to impose this arrangement on water users without allowing them to bring their own ideas and suggestions (even rejecting it!). Clearly each sub-catchment has its own properties and dynamics, necessitating a flexible, situational response. In addition, the system should be allowed to change over time responding to shifts in demand, problems arising and possibly changes in supply. It is possible that in the future the volumetric caps (permits) and proportional caps might be traded between intakes and sectors, a facility now recognised in the new water legislation.

Institutional ownership and sustainability

It would be a truism to argue that the arrangement would depend on all stakeholders meaningfully agreeing to the constraints and benefits imposed by it. However, some significant factors that promote institutional sustainability might be:

1. The four concerns above (process of setting thresholds; information needs; the role of design, allowing flexibility) are important.
2. The river basin office would need focus on delivering a variety of services, including conflict resolution, re-setting the caps (and permits) and ensuring follow up modifications to infrastructure.
3. The paper has focused on the question of 'supply management' (though by capping and sharing supplies, not in the usual sense of augmenting supply), rather than on 'demand management' (persuading farmers to be more water efficient so that intake flows can be reduced). Although demand and supply management are often connected 'chicken and egg-wise', the success of any supply reduction would depend on whether productivity of water can be raised, which research in the area suggests it can (Mdemu et al., 2003).

Conclusions

The paper shows how two decisions – setting the maximum volumetric cap and maximum proportional cap – determine the allocation of water in a river basin characterised by an order of abstraction, and the presence of irrigation and wet and dry seasons. These decisions allow us to think of ways how (if irrigation is upstream of wetlands and hydroelectric plants) irrigation abstractions could be managed and modified by design and by operation. Moreover, this think-piece provides possible means to rationalize the interface between formal water rights (that establish and relate to the volumetric cap) and customary agreements (that relate to negotiations over shares of the in-stream water). Thus, with respect to the latter the paper demonstrates how, if strengthened and supported, local customary negotiations combined with water management interventions, might help set and relate to the proportional cap of water abstraction that applies during the dry season. Furthermore, the paper argues that the design of irrigation intakes, in terms of maximum capacity, adjustability and any proportional capability, needs to be re-visited and re-tuned so that the intakes fit and help support any newly modified caps and their associated sharing arrangements.

The formulation here is presented as an exploratory piece, and fully acknowledges that such a framework is not being presented as policy-advice. That said, further discussion on water management in the Great Ruaha is advised – whether that focuses on the ideas presented here, or on other wider issues such as the role of storage, water productivity and so on. In addition, the authors are well aware of some of the problematic aspects of this framework if it were to be operationalized.

These conditions, which invoke this framework as an option, are found in the wider Rufiji Basin, and in parts of the Pangani Basin. The latter also suffers from considerable conflicts that have arisen both due to increasing demand but also to the imposition of a formal water rights structure that has yet to be further refined. Although one option is given here, various possibilities include managing the status quo, an outright return to customary rights, constructing storage or building in volumetric water measurement to charge for water used. Substantively, the paper therefore calls for further discussions on the way ahead, made relevant to the issues found at the sub-catchment scale rather than at the basin scale.

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Notes

1. SMUWC – Sustainable Management of the Usangu Wetland and its Catchment, a natural resources research and development project funded by DFID in year 1999-2001.
2. RIPARWIN - Raising Irrigation Productivity and Releasing Water for Intersectoral Needs, a research project funded by DFID KAR during 2001 to 2005.
3. A third activity is the monitoring of river flows in selected sites using automatic gauging stations, although some of these are now not functioning. Although this is a vital part of river basin management, such measurements are not related to demand or management of water, and consequently users have no stake in this information being collected and distributed.
4. Up to 1993/94, the Great Ruaha was a perennial river flowing through the Ruaha National Park. Since that date, the river has dried up for between 2-8 weeks each year during the tailend of the dry season. The main explanation for this is continuing abstraction into irrigation intakes for a variety of productive, domestic and non-productive purposes. RIPARWIN and RBWO (and other stakeholders) share a common vision of water distribution, which can be distilled down to the need to return the Ruaha River to year round flow by 2010. This directly relates to the statement by the Prime Minister of Tanzania, Frederick Sumaye, in London, (6th March 2001), made with PM Blair for the Rio+10 Summit; “I am delighted to announce that the Government of Tanzania is committing its support for a programme to ensure that the Great Ruaha River has a year round flow by 2010. The programme4 broadly aims at integrating comprehensive approaches towards resources planning, development and management so that human activity does not endanger the sustenance of the Great Ruaha ecosystems.”. Achieving year-round flow would be, from a number of perspectives, a marker of success in achieving integrated water management in the Basin.

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Driving forces behind African transboundary water law: internal, external, and implications

Jonathan Lautze, Mark Giordano, and Maelis Borghese

While it may be commonly assumed that transboundary water law is driven by water related concerns revealed in the texts of international agreements, external, textually invisible factors often influence the formation and realization of treaties as well. Using both textual and contextual analysis, this study provides an initial assessment of the drivers of international water law in Africa's post-colonial period. The authors first develop a typology of major drivers and then use that typology to examine the development and implementation of transboundary water law in four African basins: the Nile, Senegal, Niger, and Volta. The analysis reveals that, while virtually all agreements are driven by a combination of internal and external factors, external drivers have played a major role in agreement orientation and realization and in some cases are even responsible for treaty formation. Importantly, these external drivers generally reflect global paradigms that have been imported to Africa regardless of whether conditions on the continent warrant their use.

Keywords: transboundary, water, law, Africa, drivers, external, internal

Introduction

Africa is a land of transboundary waters, with international river basins covering fully 62 percent of the continent's land mass. Africa is also a continent with a long history of transboundary water management and a voluminous body of transboundary water law, which at least partially regulates the use of many of its basins (Lautze and Giordano, in submission)[1]. While an understanding of the scope and nature of the continent's transboundary water law supplies an important tool to improve future management of the its shared waters, an examination of the factors which have driven the formation, orientation, and realization of that law can help to understand both why it evolved, in whose interests, and the likelihood for its meaningful implementation.

Although there exists some literature on trends in international water management and international development (World Commission on Dams, 2000; Hajer, 1996; Saleth and Dinar, 2000) and a growing body of research on conditions in Africa's transboundary waters (Godana, 1985, Hirji and Grey, 1998; Ilomaki, 1999; IUCN, 2004; Okaru-Bisant, 1998; Rangely et al, 1994; Sadoff et al., 2002; UNECA, 2000), there is as yet no work which systematically examines the drivers of international water accords on the continent. This study aims to partially fill this knowledge gap. The paper first defines drivers and develops of typology for their consideration based on an analysis of the corpus of African transboundary water law[2] and relevant literature (Allan, 1999; Godana, 1985; Okaru-Bisant, 1998; Hajer, 1996; Saleth and Dinar, 2000; World Bank, 1995; World Commission on Dams, 2000). The paper next presents case studies from four African basins—the Nile, Niger, Senegal, and Volta—to illustrate and substantiate the role of drivers on treaty formation, orientation, and realization with special reference to the post-colonial period.

The findings indicate that a range of factors have driven transboundary water law in Africa in the post-colonial period. Internally, these factors include joint management, water development, and water sharing and division. Externally, they have included a range of factors emanating largely outside the African continent including geopolitics, the concept of hydraulic mission, cultural ties, international environment agendas, and global concern with water conflicts. The results show an evolutionary change in the way these external factors have influenced African transboundary water law. More importantly, analysis of the way internal and external drivers interact suggests that both must be considered by basin states and the outside actors if either is to achieve their objectives.

Drivers and Treaties: Definitions and Distinctions

Drivers are defined in this paper as the goals and interests which lead to the formation of transboundary water accords. Drivers should be distinguished from the actors who attempt to realize these goals or interests. To identify the drivers of Africa's transboundary water agreements, an analysis of the largest known collection of transboundary water law related to Africa was conducted.[3] The collection includes all known agreements concerning "water as a scarce or consumable resource, a quantity to be managed, or an ecosystem to be improved or maintained..." and excludes those dealing "only with boundaries, navigation or fishing rights" (Wolf, 1999: 160).

In examining African transboundary water law, it is clear that agreements are generally brought about through a combination of drivers rather than one single force. These drivers can be conceptually divided into two categories: internal and external. Internal drivers are defined here to be those goals or objectives contained in transboundary water agreements; e.g., extension of basic water supplies, hydropower development to facilitate economic growth, or dam construction for irrigation projects. External drivers are defined as those which are not explicitly contained in agreements but nevertheless wield substantial influence on the formation and orientation of treaties. As explained further below, examples of external drivers include a basin's geostrategic importance, global paradigms in water and environmental management, a perceived religious or cultural affiliation, and recognition of the potentially conflictive nature of transboundary waters.

In the case of Africa's transboundary water law, another important distinction is made between treaties which are primarily driven by water-related issues or and those primarily motivated by non-water factors. Approximately two-thirds of African agreements concluded between or among colonial powers[4] were in fact precipitated by non-water factors such as territorial division and recognition of traditional land use customs. These customs often included transhumance and movement of people, and water use needs, across newly formed boundaries (Lautze and Giordano, in submission).

An example of a treaty which included water issues only secondarily is the 1906 *Agreement between Great Britain and the Independent State of the Congo, modifying the Agreement signed at Brussels, May 12,1894, relating to the Spheres of Influence of Great Britain and the Independent Sate of the Congo in East and Central Africa*, signed in London. The primary objective of the treaty was mutual recognition that the boundary between the Congo and Sudan should extend "from the point of intersection from the south of the meridian of 30 degrees longitude east of Greenwich with the watershed between the Nile and the Congo…until it reaches the frontier between the Independent State of the Congo and French Congo." Since a portion of the Nile watershed was shared by the Congo and Sudan according to the newly drawn boundaries, agreement on water division also became necessary. Thus followed a secondary provision: Congo agreed "not to construct, or allow to be constructed, any work on or near the Semliki or Isango River, which would diminish the volume of water entering Lake Albert, except in agreement with the Soudanese Government" (2 Hertslet 584; UNLS 99).

Unlike most agreements signed between and among colonial powers, water-related interests constitute primary drivers in almost all transboundary water treaties involving at least one independent African state. Because of this fundamental difference, and more importantly because drivers of colonial treaties were primarily related to the concerns of now defunct colonial governments, the remainder of the paper concentrates on post-colonial agreements in order to identify drivers more reflective of current African conditions and therefore more relevant to future accords.

Post-Colonial treaties: internal drivers

Textual analysis of post-colonial African agreements reveals a number of internal drivers as shown in Table 1.[5] The most common of these is joint management of shared water resources. Joint management implies agreement on a set of principles or structures through which the shared water resources of involved countries are collectively managed. Joint management appears an extremely common goal in agreements between or among independent states, and is generally (and noticeably) absent from agreements involving at least one colonial power.

Table 1. Internal drivers of post-colonial African transboundary water law

Internal driver
Joint Management
Water Development for Hydropower and Agriculture
Environmental Sustainability
Water Allocation/Division

The second most-common driver in post-colonial agreements is water development. Water development indicates that countries seek to harness more water—generally through the construction of dams—as a means for hydropower or irrigation expansion. While this driver is well evidenced in Africa's international water agreements throughout the post-colonial period, water development is most commonly found in accords concluded in the first two to three decades of independence period. Reflecting the influence of this driver, two water management bodies—the *Senegal River Development Organization (OMVS)* and the *Gambia River Development Organization (OMVG)*—were established in the 1970's which expressly sought to "put into value" or develop, as evidenced in their titles, the perceived societal potential of these shared waters (FAOLEX, 2004).[6]

While the international water agreements from post-colonial Africa's first two to three decades placed much emphasis on water development, the last one to two decades have seen increasing importance placed on environmental sustainability (Lautze and Giordano, in submission). Indeed, environmental concern has been a principal driver for several agreements in the 1990's and 2000's. For example, the *Protocol for Sustainable Development of Lake Victoria Basin*, signed at Arusha on November 29, 2003, contained as its major goals "protection and conservation of the basin and its ecosystems", implementation of "environmental impact assessment" by signatories, "prevention of pollution", and "environmental audits" (FAOLEX).

A final internal driver[7] in post-colonial transboundary African water law is water allocation or division between or among countries. Not surprisingly, most treaties which divide water apply to the Nile river basin and the basins in southern Africa where water demand frequently approaches supply. One of the most prominent examples of a treaty internally driven by water division is the 1959 *Agreement between the Republic of the Sudan and the United Arab Republic for the Full Utilization of the Nile Waters*, which explicitly allocated Egypt 48 billion cubic meters of water each year and Sudan 4 billion cubic meters of water per year (453 UNTS 63).

Post-Colonial treaties: external drivers

Examination of the larger context within which African transboundary water law has developed suggests that external drivers wield substantial influence on treaty formation, orientation, and realization. Unfortunately, external drivers are rarely stated in agreements, and there is little to no literature which attempts to systematically identify them. The authors therefore use a review of related literature (Allan, 1999; Okaru-Bisant, 1998; Andreini et al., 2000; Andreini et al., 2002; World Commission on Dams, 2000; Hajer, 1996; Saleth and Dinar, 2000; Giordano, 2002; Godana, 1985; Nakayama, 2003; World Bank, 1995) to conceptualize the likely factors and then use the case studies which follow for initial confirmation. The review suggests that the major external drivers of Africa's transboundary water law are a country's geostrategic importance, prevailing paradigms in water resources management and development in general, perceived religious or cultural affiliation, and international recognition for the special nature of transboundary waters—in particular their perceived conflict potential.

The most important external driver in the early days of post-colonial Africa's transboundary water law development appears to be the perceived geostrategic importance of countries involved. Upon achieving independence from colonial nations, most developing world states were immediately thrust into the power politics of the Cold War, in which the quantity and source of aid depended on political ideology professed and relative importance of a country's location (Allan, 1999). For example, unlike most of sub-Saharan Africa, Egypt had an important geostrategic position, containing the Suez Canal, bordering on Israel, and situated in

the heart of the geostrategic nerve center of the Middle East. It should therefore come as little surprise that the country benefited from many early post-colonial developments in African transboundary water law[8] (Godana, 1985).

Table 2. External drivers of post-colonial African transboundary water law

External driver
A Country or Region's Geostrategic Importance
Global trends in Water Resources Management and Development
Religious or Cultural Affiliation
International concern with transboundary waters

While the quantity of aid provided to realize treaty objectives was often influenced by the perceived importance of a country's location, the form that aid took was generally driven by the prevailing paradigms in water resources management and development. From early 20th century through the 1970's and 1980's, the "hydraulic mission" paradigm pervaded water resources management policies (Allan, 1999; World Commission on Dams, 2000). Engineers generally sought to use dam construction to harness rivers' waters in order to facilitate economic and social development, giving little attention to the externalities of this approach (World Commission on Dams, 2000). Similar to projects undertaken elsewhere in the world, African projects and the agreements which supported them reflected this strategy.

The "hydraulic mission" paradigm began to give way to environmental concerns emanating from the US and Europe in the 1970's. By the mid to late 1980's, international lending agencies such as the World Bank—which had assumed a large role in Africa's economic development—were increasingly influenced by concepts such as environmental and economic sustainability and began to explore how these notions could be incorporated into more comprehensive approaches to water resources management. In 1989, the World Bank Operational Directive (OD) 4.00 concerning environmental policy for dam and reservoir projects was released. It stated that "adverse environmental impacts should be avoided, minimized, or compensated for…"(World Bank, 1995). By 1992, two additional OD's were released, with the net effect that World Bank and other donors would thereafter exercise serious caution when undertaking water development projects (World Bank, 1995; Allan, 1999; Saleth and Dinar, 2000). It now appears that environmental concerns and water development may actually be experiencing a role reversal. That is, whereas the World Bank and other donors initially envisioned an environmental constraint on projects driven by desires for water development, there are now cases in which the environmental conservation is the goal and future efforts to develop water may actually be seen as a constraint (Okaru-Bisant, 1998; see also recent agreements applying to Lake Victoria).

Another factor which has driven the formation and realization of transboundary water agreements is cultural or religious affiliation. Be it a common historic connection from colonialism, a common religious identity, or regional solidarity due to a similar cultural base, common ties have at least occasionally driven treaty formation and content. Examples of this can be found in the Senegal river basin, where a common Muslim identity with Arab states resulted in aid to support treaty concepts (LeMarquand 1986; LeMarquand 1990).

Finally, while geostrategic location has diminished in importance as a driving force in transboundary water accords following the end of the Cold War, a new external driver has come to spark the formation of transboundary water agreements: international recognition for the potentially conflictive nature of transboundary water resources. By the early 1990's, discussions of 'water wars' were common both academically and in the popular press (e.g., Starr, 1991) and by the end of the decade at least some authors believed that resource competition would replace the Cold War conflict (Klare, 2000). Transboundary water agreements were seen as one mechanism to minimize the potential for such conflict, and the World Bank released an OD in 1990 which stated "projects on international waterways require special handling" and "the Bank…attaches the utmost attaches to having riparians enter into appropriate agreements…" (World Bank, 1995). Thus the Bank and other organizations sought encourage states which might not otherwise do so to create transboundary institutions codified in agreements.

The interesting finding here is that the external drivers discussed—geopolitics, hydraulic missions, environmental concerns, cultural affiliation, and water wars—are all primarily related to events and concerns emanating outside of Africa. However, as shown in the case studies below, they clearly impacted the orientation and realization of African transboundary agreements. One may even contend that in many cases these external drivers led to the formation of the agreements themselves.

The Nile

An examination of post-colonial transboundary water treaties applying to the Nile river basin reveals a rich and evolving set of drivers. Clear correlations are evident between internal agreement drivers, the time in which an agreement was signed, and the portion of the Nile to which a treaty applied. As shown in Table 3, developments concerning downstream portions of the basin—generally Egypt—occurred earlier and were very often focused on harnessing additional water to facilitate increases in irrigation and hydropower. Upper basin developments occurred later and were driven much more by a desire for joint management and environmental sustainability.

Table 3. Temporal and Spatial Variation in Nile Basin International Water Agreements[9]

	1925-1960	1977-2003
Number of Agreements	9	6
Portion of the Nile to which agreement applies	100 % downstream	83 % upstream
Creates or Assumes Joint Management Structure	22 %	83 %
Provision for Water Development	89 %	33 %
Environmental Sustainability	0 %	50 %
Water Sharing/Division	44 %	0 %

In total, fifteen substantive transboundary water agreements[10] were signed between 1925 and 2003 which apply to portions of the Nile river basin; notably, not one of these applies to the entire basin.[11] Nine agreements were signed between 1925 and 1960. All of these agreements included downstream Egypt as signatory and were chiefly concerned with water development and water allocation by which Egypt's needs were satisfied. Between 1977 and 2003, six additional agreements were signed. Five applied to upstream portions of the basin while one was signed between Egypt and Ethiopia concerning downstream areas. Of the five treaties applying to upstream portions of the basin, three were concerned with joint management to achieve environmental preservation of Lake Victoria. Two agreements sought to install a joint management structure to facilitate water development in the Kagera river basin, a tributary of the Nile.

It can be asserted that the temporal trends in Nile basin treaty drivers reflect a common phenomenon in upstream-downstream river basin relations. For example, several authors (e.g., Molle, 2003; Turton, 2003) have identified a recurrent pattern in which upstream water abundance leads to downstream establishment of a historic use of a river's waters. Then as water abundance turns to water scarcity, downstream riparians seek to codify and enhance their position vis-à-vis upstream counterparts. Egypt epitomizes the downstream country seeking to preserve and advance its claim to prior use.

While this theory contains important points, it fails to explain how Egypt mobilized substantial international support for its position. That is, not only was outside backing necessary for Egypt to codify its historic water allocations, substantial foreign aid was required to construct the dams which increased the country's water endowment. Clearly, external forces intervened to advance Egypt's position. The country's geostrategic importance, initially as controller of the Suez Canal and later due to its proximity to Israel and the centrality of the Arab-Israeli conflict in the Cold War, helped to make power brokers in the USA, the USSR, and Western Europe more inclined to favor Egyptian interests (Godana, 1985). The country's location led outside powers to make allowances for what most would consider a disproportionately large share of the Nile's waters.

In addition, as the "hydraulic mission" water management paradigm was very much in force between 1925 and 1960, foreign aid provided to obtain Egypt's favor is manifested in agreements (Allan, 1999) in the form of dam construction projects, such as those at Owen Falls and Aswan (207 UNTS 277, 453 UNTS 63). The "hydraulic mission" paradigm similarly impacted the two agreements applying to the Kagera sub-basin of the Nile watershed. Signed in 1977 and 1981, both or these agreements sought to jointly manage and develop—i.e., though water harnessing—the resources of the Kagera river basin (1089 UNTS 171; World Commission on Dams, 2000; Allan, 1999).

Between 1994 and 2003, three agreements were signed which applied to Lake Victoria in the Nile's upper reaches. Consistent with the evolving paradigm in water resources management, these treaties were all driven by a desire to promote better management of environmental resources. These environmental agreements were largely facilitated if not directly initiated by international actors such as the World Bank and the Global Environmental Facility (GEF) (Okaru-Bisant, 1998). Indeed, increasing international concern with the environment has sparked much of the legal development in the upper reaches of the basin. Okaru-Bisant (1998), for example, has noted how external interests exerted pressure on African countries to sign agreements over water so as to obtain financial or other support for their national goals.

A final note should be made concerning recent efforts to form a basin-wide management structure for the Nile within the framework of the Technical Committee for Promotion of the Development and Environmental Protection of the Nile (TECCONILE). The TECCONILE, formed in 1993, initiated a series of 10 Nile 2002 conferences which can be seen largely as the result of four separate drivers: one internal and three external. Internally, there was a desire to collectively manage and share the benefits of the Nile's waters—particularly among upstream countries disgruntled with their disproportionately small water allocations. Yet such complaints from upstream countries were nothing new (Godana, 1985). What was new was an international (donor) community increasingly concerned with the potential for conflict over scarce water resources, a post-Cold War international community in which Egypt's geostrategic importance had declined,[12] and an international community increasingly concerned with the environment (Ilomaki, 1999; Allan, 1999; Okaru-Bisant, 1998). Hence these external drivers substantially influenced the process of dialogue on the collective management and environmental protection of the Nile's waters and may eventually result in a new agreement.

The Senegal

Six transboundary water agreements have been signed in the post-colonial period applying to the waters of the Senegal river basin.[13] All of these agreements were signed between 1963 and 1978, and all possess as their major internal drivers joint management and water development. While these goals can be seen as closely linked with the post-colonial development priorities of the riparian states of Guinea, Mali, Mauritania, and Senegal, which strongly relied on water resource use to promote agriculture and increase power output, it is nevertheless interesting to note that these states sought to pursue joint development programs rather than independent agendas.

Several factors combine to explain the fact that a joint approach was taken. First, all four riparian countries were ruled by the same colonial power, which in fact did not treat these territories as distinct until just prior to independence; hence there was a tradition of cooperation. Second, although no tangible progress was made, colonial French initiatives for water development often took a basin-wide approach—laying the groundwork for such initiatives in the post-colonial era.[14] Third, the fact that a significant portion of the Senegal river actually constitutes a border necessitates some level of cooperation if structures such as dams are to be built. Fourth, the limited financial and technical capacities of riparian states at the time of independence made countries inclined to cooperate with each other in order to amass as much local financial and technical capital as possible as well as to maximize their chances of attracting foreign investment (Reichshold, 1978, LeMarquand, 1986, LeMarquand, 1990, Meublat and Ingles, 1997).

Indeed, limited financial and technical capacities of these young African states engendered a linkage between internal and external drivers. Riparian states could agree on a development program, but international actors were needed to supply the means to implement that program. Immediately after independence, international donors were in fact called upon to support basin development both financially and technically. Following the

creation of the "Inter State Committee" in 1963 with the collaboration and financial support of UNEP and the FAO, riparian countries approached the UN to obtain support for basin research and planning development projects (Reichshold, 1978) in order to implement an integrated development program of the basin's water resources. This collaboration was codified in 1968 with the creation of the "Senegal River Riparian Countries Organization", though it is unclear how much was tangibly accomplished. Confronted with too ambitious objectives and political disagreement between Guinean government and other riparian countries, the organization collapsed after four years (Fox and LeMarquand, 1979, Ndao and Sall, 2002).

A strong will for cooperation nevertheless persisted among Mali, Mauritania and Senegal. The severe drought from 1968 to1973 reinforced the need for jointly managing basin resource use (Feckoua 2000, Lahtela 2003, Kipping 2004), and led to the creation of the Senegal River Development Organization (OMVS) in 1972. The organization initially released an ambitious program which included the "promotion of inter-country cooperation; coordination of technical, economic studies and other activities related to Senegal river development such as…irrigation, hydropower generation, environmental protection and conservation; regulation of river flow for irrigation, flood control, power generation and other purposes". Following negotiations with donors at the beginning of the 1980's, however, the organization's action program was reduced and focused mainly on two dam projects completed between 1980 and 1987: Manantali Hydropower dam on the Bafing River in Mali and Diama anti-salt Dam in the Senegal River delta. The construction of the two dams was financed by a grant of US$820,000 by a consortium of over fifteen donors and funding agencies (OMVS, 2004; Fox and LeMarquand, 1979, Ndao and Sall, 2002).

It therefore seems that the OMVS's creation and goals reflect a combination of factors: internal drivers such as water development to increase electricity production and expand irrigation as well as external drivers like donors' willingness to lend. This arrangement is codified in the OMVS's institutional and juridical framework, in which external donors are responsible for OMVS projects while member states supply only organizational functioning costs (OMVS, 2004). The major donors for the OMVS development program are various Arab oil-exporting states or related financial institutions (48%), Germany (14%), European Union (12%) and France (7%) (OMVS, 2004; LeMarquand, 1986).

These entities had various interests in participating in Senegal River basin development by financing OMVS projects. In the case of the OMVS development program, donors have been primarily motivated by a desire to maintain or expand political influence over the region; this is particularly true in the case of Arab donors, who may be motivated by their religious affiliation with basin inhabitants (LeMarquand 1986, 1990). While some economic drivers can also be listed, Germany and France may have expected to profit from raw material extraction for instance, it is unlikely this had significant impact (Kipping 2004). Finally, Western donors may have had incentive to contribute given the political impact of the 1970's Sahelian drought and the subsequent famine on public opinion. (Reichhold 1978, LeMarquand 1986, LeMarquand,1990, Meublat and Ingles 1997, Kipping 2004).

The Niger

Ten international water agreements have been signed in the post-colonial period which apply to all or part of the Niger river basin.[15] Like the Senegal, the idea to promote basin-wide development in the Niger had its roots in the colonial era. The first post-colonial agreement applying to the Niger river in fact abrogated a colonial-era treaty. This agreement, the 1963 *Niamey Act relating to transportation and economic cooperation*, acknowledged the Niger River's international nature and need for international regulation on basin resources use. As a result, the Niger River Commission was established between Upper Volta, Dahomey, Cameroon, Chad, Guinea, Ivory Coast, Mali, Niger and Nigeria by agreement in 1964.

Similar to six of the ten post-colonial agreements applying to the Niger, the internal drivers of these first two Niger treaties (concluded in 1963 and 1964) were joint management and water development. In addition, there were two agreements which concentrated mainly on hydrologic monitoring and data collection and one agreement focused on appropriate financial contributions by member states. The most recent agreement applying to the Niger basin, concluded in 1990, was primarily concerned with sustainable development and environmental conservation. Interestingly, of the ten Niger basin agreements, eight included all major riparians.[16]

Nevertheless, despite the substantial body of transboundary water law applying to the Niger, very few of the goals embodied in the agreement have been realized. The Niger River Commission (NRC) suffered from a lack of human, technical and financial means in both its executive secretariat and member countries' national administrations. Although it mobilized the financial support of UN agencies to conduct various studies, few made tangible impacts (IUCN, 2004).

Disappointed by the NRC's inadequate results and encouraged by donors to adopt a new approach, member states decided to replace the Commission with a new water management body possessing a broader mandate. In 1980, the Niger Basin Authority (NBA) was conceived during a meeting in Faranah, Guinea. Endowed with a stronger executive secretariat based in Niamey, more funding from its member states, and a mandate for the entire basin rather than merely the Niger river itself, the NBA was formed to promote regional cooperation and implement integrated basin development in various sectors[17] (ABN, 2004).

Like the NRC, the NBA realized few of its stated goals in its initial two decades. Although it theoretically undertook many projects under the financial supervision of various donors, only the Documentation Center supported by UNESCO and the Hydroniger hydrological monitoring and forecasting project funded by World Meteorological Organization were in fact implemented. Many analysts, including some within the NBA itself, have commented on the organization's inefficiency. Milich and Varady (1999), for example, note that "little had been achieved beyond the stockpiling of reports and action plans." By the 1990's, most member states stopped paying their contribution to NBA and participating in NBA meetings. Confronted with this lack of political will, donors reduced their involvement in NBA projects (IUCN, 2004).

Nevertheless, the period from the 1998 NBA Ministry council in Abuja has been called the NBA renaissance (IUCN, 2004). It was at this time that the NBA executive secretariat conducted an environmental and transboundary "sensibilization" campaign among governments of its riparian countries. In 2000 and 2002, at the Bamako and Abuja heads of states summits, the NBA set the objective of developing a shared vision for integrated basin development. Since then the NBA has begun to regain donors' interest and trust. Capitalizing on recent international awareness for environmental water issues, the NBA has been able to attract new funding and may finally be realizing the goals set forth in the numerous agreements applying to the basin (UNECA, 2000). Supported by various donors, many projects are finally being undertaken: an institutional and organizational audit funded by the World Bank, French and Canadian governments, a technical and operational capacity building supported by the World Bank, the Netherlands Bank, OPEC, French government and development agency, a project against land degradation financed by UNEP and the World Bank, a project against erosion supported by the African Development Bank, and two IWRM supported projects funded by the French and Canadian Development Agencies and the European Union (Bello Tuga, 2004).

While factors such as geography[18] may have worked to inhibit cooperation in the Niger Basin (Madiodio, 2004), the fact remains that ten agreements were signed between 1963 and 1990 to create or modify joint management frameworks—and six of these ten were intended to develop water resources as well. Why were these agreements signed if there was little will to implement them? One wonders if the short-term gains of signing an agreement constituted incentives in themselves. Whatever the case, the Niger River Basin is one of the poorest in the world, and one which generally avoids the international spotlight (IUCN, 2004). As such, past developments in the basin were unlikely to have been strongly driven by outside factors as the region is of minimal economic interest and little international attention is paid to it. That said, the recent progress in transboundary environmental issues in the basin may indicate that external drivers have finally arrived to motivate consideration for these issues.

The Volta

The Volta basin contains the Akosombo dam, one of the largest in the world. The dam can be considered a prime example of the "hydraulic mission" philosophy and was largely funded the American public and private finance; in particular, the American aluminum company Valco (Andreini et al., 2002). Interestingly, though the dam, located in Ghana and built in the mid-1960's, relied on large influxes of water from upstream countries to generate power, no agreement was concluded between and other Volta basin riparians to ensure that such water would arrive. It was not until thirty years later that outside involvement in national water strategies of the

basin's riparian countries led to considerations of transboundary issues. In the mid-1990's, the World Bank took an active role in the water affairs of Ghana and Burkina Faso and invoked its transboundary waters policy whereby a country "proposing to execute any project which will regulate, abstract or otherwise change river flows must notify co-riparian states of its intentions so that each state may consider whether it wishes to lodge an objection"(Ministry of Works and Housing, 1998; World Bank, 1995).

This policy led to the Volta's first post-colonial agreement concerning water as a limited and consumable resource. In 1996, Burkina sought World Bank support to construct a dam at Ziga, which would alter the flow of water into Ghana. To satisfy the Bank, a Ghanaian delegation visited Burkina and signed a "no-objection" document agreeing to the dam's construction. This event produced discussion about more coordination and collaboration between Ghana and Burkina in the management of the Volta's waters. A Volta Basin Water Management Initiative was then launched with the help of national and international donors to serve as a medium for communication and dialogue on transboundary water issues; the initiative was short-lived (Ministry of Works and Housing, 1998; van Edig et al., 2003; van Edig et al, 2001).

Interest in transboundary management of the Volta did not intensify again until reduced water levels at the Akosombo dam led to an energy crisis in Ghana in 1998. Exacerbated by conditions of drought in parts of the basin, downstream Ghana accused upstream Burkina of withdrawal increases and obstruction of Volta river flow (van Edig et al., 2001). Although it has been shown that Burkinabe withdrawal had little to do with reduced flow in Ghana (Andreini et al., 2000), the need for some degree of cooperation and information exchange became evident. International organizations responded *en masse* to this presumed need in the years which followed.

The GLOWA Volta project was one of the first to contribute to transboundary water cooperation, aiming to develop a scientifically sound Decision Support System (DSS) for the assessment, sustainable use, and development of the Volta basin's water resources (Van Edig et al., 2003; Van Edig et al., 2001; Andreini et al., 2002). In 2002, Green Cross International identified the Volta basin as potentially conflictive, so the organization engaged civil society representatives across the basin to develop commonly accepted principles and cooperative governance policies for management of the shared water resources (Curtin and Charrier, 2004). In 2001 and 2002, the Global Environmental Facility (GEF) funded projects, which identified major environmental problems in the basin and presented ways to address these areas of environmental concern (Global Environmental Facility, 2002a; Global Environmental Facility, 2002b). Several others, such as UNEP, the EU, and the IUCN, have also emerged to promote sustainable and equitable governance of the Volta basin (UCC, 2004; International Office for Water, 2004; IUCN, 2004).

Concurrent with the recent increase in international actors, two international agreements have been signed with the aim of creating a path for construction of a significant transboundary water management institution. In April of 2004, the governments of Ghana and Burkina signed the *Ghana-Burkina Joint Declaration* which acknowledged common water and environmental issues and stated a desire to collaborate on management of shared water resources through a Volta Basin Technical Committee involving all riparian countries. This work was followed by a conference in Ouagadougou July 29 and 30, 2004, attended by representatives from Benin, Burkina Faso, Cote d"Ivoire, Ghana, Mail, and Togo. All six countries accepted a series of agreements which acknowledged the need for a transboundary management institution and accepting a timeline for its creation. The process was to begin with the launch of a Volta Basin Technical Committee (VBTC) in November of 2004, which would hold its first meeting in December of the same year (Direction Générale de l'Inventaire des Ressources Hydrauliques, 2004).

In sum, three agreements have been signed concerning the waters of the Volta basin. The first of these three was quite directly motivated by the World Bank which was seeking to mitigate the potentially conflictive nature of transboundary water resources. The two which followed were also closely linked to outside influences. Although there likely was local desire to collectively manage the shared water resources of the Volta basin, particularly after the 1998 energy crisis, the fact that the latter two agreements were signed in the years just after numerous international actors arrived in the basin, and more generally that such agreements were signed in the precise time period in which attention is being paid to concerns of transboundary water conflict and environmental issues, leads one to deduce that external drivers have played the dominant role in agreement formation.

Conclusions

While any analysis such as that presented here leaves room for interpretation, the results strongly suggest the presence of an evolving set of internal and external drivers behind both treaty orientation and formation. From the 1950's to 1980's, numerous agreements were signed applying to the waters of the Niger, Nile, and Senegal. Virtually all of these agreements embodied an agenda of water development, which seems to have reflected both local ambitions and prevailing global paradigms. In the Nile, such development, aided by geostrategic factors, was largely achieved and much of the basin's water was captured for human use. In the Senegal, progress in terms of stated treaty objective was made as well: two dams were constructed, funded largely by outside states with colonial or cultural ties, and water was harnessed for societal benefit. Even in the Volta, which did not sign an agreement to develop water in its early days, a major dam to harness the basin's waters was constructed using funds from private and public American sources—probably reflecting a desire to establish political influence on one of sub-Saharan Africa's first independent countries. While the development aims of Niger basin agreements were similar, lack of internal will and failure to mobilize external support meant that little was in fact achieved on the ground.

In more recent years, environmental agendas and concerns over transboundary conflict have come to the fore, attracting international attention and aid. Most of the upper Nile agreements, the TECCONILE process, the NBA "renaissance", and the Volta basin agreements reflect environmental and transboundary conflict prevention concerns and all were influenced by outside forces and finances. In all likelihood, the World Bank's directive on transboundary water cooperation and a global agenda of environmental conservation were behind the formation of recent agreements and related negotiations in the Nile, Volta and Niger.

The interesting issue is the degree to which the formation, content, and realization of transboundary water law in post-colonial Africa is determined by external drivers. Such drivers, it should be noted, are not only external to treaties—they are external to Africa itself. They are in fact generally the product of international—read: developed world— agendas. While Africa may benefit from knowledge and lessons acquired elsewhere in the world, it can also be argued that the external drivers often encourage ideas which do not conform to local conditions and interests. Environmental concerns and conflict prevention, in particular, may have been imported to Africa before the continent's levels of economic and water resources development warranted. Indeed, while the environment is important no matter the level of development, the form that environmental protection takes and the desired tradeoffs between the environment and growth are also, at least in part, a function of income. Encouraging environmental norms from the developed world may be more in the interest of Western environmentalists than poor African farmers. Similarly, levels of water scarcity in Africa, the Nile excepted, are generally less than those of other regions of the world, suggesting that resources spent to avoid conflict could in fact be better employed to augment the quantity of water available—an approach which might accomplish the same ends while improving human welfare.

Nevertheless, while external drivers may not always have led to optimal outcomes for Africa, analysis of their role and impact does suggest promising paths for the development of future transboundary water law in that meets both the internal desires of underfinanced basin states and the wishes of external actors. In particular, it suggests that those agreements in which internal desires coincide with external forces have the highest chances of meeting objectives of all partiers involved. For example, aware of the strategic necessity to collaborate in order to benefit economically from the basin resources, Senegal, Mauritania and Mali were able to attract donors and use international concern for poverty alleviation after the 1970's drought to attract outside finance. This finance was a reflection of real concern for the welfare of the region. However, it did come primarily from countries with colonial or cultural ties wishing to maintain standing in the region. And while the ensuing projects could not have been completed without external finance, they also could not have been implemented without OMVS member states' strong internal political will.

The primary point is that it may often be necessary for poorly financed African states to orient their transboundary agreements towards external interests if they are secure the means for realization. At the same time, external actors should ensure that the agreements they influence and finance are also locally relevant if they wish to have long-term impact. Clearly, that which attracts water investment is not identical to that which meets local needs. Likewise that which outside actors wish to finance is not always a local priority. Skilled

policy-makers and negotiators should construct agreements broadly enough to accomplish both ends or they risk accomplishing neither.

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Notes

[1] A catalog of transboundary water agreements related to Africa is available at www.africanwaterlaw.org.
[2] References are available on line at www.africanwaterlaw.org and in Lautze and Giordano (in submission)
[3] Further explanation of the process used to compile this collection can be found in Lautze and Giordano (in submission).
[4] Colonial agreements in this paper are considered those agreements between or among colonial powers and exclude agreements between colonial powers and independent states.
[5] To determine the principal drivers of Africa's transboundary water agreements, the authors analyzed the texts of all agreements in the African Transboundary Water Agreement Collection for stated goals. Based on the work of others and our understanding of African agreements, the goals were divided into seven general categories: joint management, water development, water sharing and division, financial arrangements, sustainable development and environmental protection, and hydrological monitoring and data collection, and issues related to access to water resources.
[6] Note that translation is the authors' own from *L'Organisation pour la mise en valeur du fleuve Sénégal*.
[7] Note that other treaty goals (e.g., financial arrangements) occurred too infrequently and are therefore not considered major internal treaty drivers to post-colonial African agreements.
[8] Note that Egypt is assumed to have benefited from various transboundary laws which awarded the country generous water allocations. The country also benefited from substantial outside investment to realize the capacity to withdraw the water to which it was entitled by such agreements.
[9] Note that our classification system allows for a treaty to be motivated by multiple drivers, e.g., water development and water sharing/division. Hence the percentage values for each of the four drivers may sum to more than 100.
[10] Note that only transboundary, and not transnational (i.e. involving a non-riparian state), agreements are considered here. That is to say, agreements signed by one riparian state on one non-basin state are not considered unless the non-basin state was signing on behalf of a territory in the watershed. Further, all agreements considered involve at least one post-colonial power.
[11] Note that titles, dates, signatories, sources, and other details of these agreements can be found at www.africanwaterlaw.org
[12] It is probable that Egypt's geostrategic location, while still important, nevertheless declined with the end of the Cold War. Hence international actors were likely less inclined to protect Egyptian interests under the provisions of previous Nile basin agreements.
[13] Note that four transnational agreements were signed with outside countries as well. These agreements, however, are not included in the analysis of this study.
[14] This may have resulted from the fact that France controlled all of the Senegal basin. The watershed did not become transboundary until Guinea gained independence in 1958.
[15] All of these agreements, with relevant details and citations, can be found at www.africanwaterlaw.org.
[16] Note that Algeria is not considered a major riparian.
[17] agriculture, energy, fishery, forestry, hydraulic, transportation, industry, communication, pisciculture, sylviculture, livestock farming as mentioned in NBA conventions
[18] Note that the basin contains a relatively large number of riparians, perhaps adding difficulties to the implementation of agreements. Further, only a small portion of the river actually comprises a boundary, which may engender transboundary cooperation to construct a dam.

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The role of the district assemblies in the management of trans-district water basins in Ghana

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Ghana's legal regime for the management of water resources combines both the formal and informal customary law principles. Under the customary law, water as part of the customary land holding is vested in stools, communities, families, as the case may be. In the formal sector the water resources are vested in the state and any use requires a permit or license from the Water Resources Commission (WRC). In considering an application for water use in Ghana the law requires a consultation of the traditional institutions in determining the grant or otherwise. This ensures the consideration of traditional concepts and norms, such as the concept of water spirits and the holy days of water bodies. These concepts are essential for the sustainable management and conservation of water resources in Ghana.

Keywords: Ghana, customary law, water, transboundary

Introduction

Water is life and it is universally acclaimed as the most important natural resource. The end use of water is essential for every inhabitant and for a wide range of economic and informal sector activities. It is vital for agriculture, industry, health and hydropower. Water is also an integral part of the natural environment and the habitat for many forms of life, be it humans, animals, plants etc. Given current population growth and increasing demands, both in quantity and quality, the issue of water management is becoming more sensitive than any time previously in the history of Ghana.

Ghana envisages leaping to a middle income status with its concomitant increases in demand for water for economic development, and her riparian neighbours are also in the process of fashioning out similar policies for accelerated development (WARM Study, 1997). Even within Ghana, disparities in water availability may necessitate the need for the equitable management of inter-district transboundary waters, which is the focus of this paper. The aim of this paper is to consider the primary legal regime for the management of water resources, looking at the issue of ownership of water resources, the licensing process and the role of the district assemblies in the management of water resources within their district and the relationship of riparian districts.

The legal regime for water resources management

It is very difficult to identify a separate water resources management law in Ghana prior to the promulgation in 1996 of the Water Resources Commission Act. It must be stated that natural waters were managed as an appurtenance of land and therefore whoever owns a portion of land automatically may exercise certain rights over the waters contiguous to the land (Opoku-Agyemang, 2001). It is however necessary to consider the legal regime by looking at customary law principles, the common law riparian system and the current statutory intervention.

Akan Customary Water Law

Under Akan customary water law, surface water such as rivers, lakes and streams, are considered community property which can never be individually owned. Water, as part of the customary landholding is vested in stools, communities, families, as the case may be (Ollennu, 1962). Where water is in abundance, a member of a community or family or a subject of a stool, may be able to utilise a rivulet, stream or a pond which is naturally on his land, without interference from the public or the community.

As pertains to traditional landholding, a person has only usufructuary rights to water but is not considered the owner. Therefore, in times of scarcity, the whole community must share the use of the streams, rivulets, etc., irrespective of whose land is closer to the water body. In short one can say that under customary law water is a free common good; everyone is entitled in principle to its use as a community good (Ofori-Boateng, 1997). The same principle applies to groundwater. However, if an individual digs a well, priority of use may be accorded such an individual but this does not give ownership rights to the water itself. Thus, in times of scarcity, the community may also utilise the dug-well.

Riparian communities under customary law recognise the right of use of each other. Where two or more communities are contiguous to a water body, they usually agree, either expressly or through practice, on different spots from where each community may go and fetch its water. The communities manifest the communal ownership in the way they render community services in clearing paths leading to the river body as well as clearing the banks of weeds.

The basic customary water use principle among riparian communities is that each user may take as much of the water as he can carry personally and for any purpose whatsoever, provided sufficient water is left for other users as well. As rivers and other natural water bodies are considered as gods, it is considered a taboo for the "desecrating" of water bodies. It is therefore the duty of the whole community through the chiefs and religious officers to protect water bodies in their communities.

Common law riparian doctrines

Under the common law rules on riparian rights, an owner of land abutting on water, known as the riparian owner, is entitled to the access and regress from the water, whether it is tidal or non-tidal river, lake etc. provided his land is in actual daily contact with the water, either laterally or vertically.

The right of a riparian owner to access water on which his land abuts is a private and not a public right. Any interference in the enjoyment of a riparian of access to the water is actionable without proof of any special damage. Riparian right to access to water does not depend on ownership of the bed of the river or other water bodies.

In addition to his right to access and regress from the water, a riparian owner is entitled to land or to pass over the shore or bed at all states of the water for that purpose, even if the shore or bed is not vested in him. Apart from the right of access and regress, a riparian has an incident to his property in the riparian land a natural and proprietary right, not dependent on prescription, grant or acquiescence of the riparian owner upstream, but arising jure naturae. He is entitled to have the water in any channel which his land abuts or which passes through or under his land, flow to him in its natural state both as regards quantity and quality, whether he has made use of it or not. A riparian owner also has the right to have the water go from his land without obstruction and he is entitled to make certain uses of the water which comes to him whilst it is on his property.

Where there are multiple land owners abutting a river or lake, the right of each riparian owner is to have; (a) unimpeded access to and from the river; and (b) to have the natural flow of the stream come to his land and to make reasonable and just use of it as it flows through his land, subject however to the similar rights of each riparian owner upstream and subject further to the obligation to lower owners to allow the water to pass away from his land unaffected except by such consequences as follow from reasonable and just use.

It therefore means that in so far as an upstream riparian owner can justify that the use of the water passing through his property is reasonable, he can deplete all the water for his use to the detriment of the downstream owner. Thus, for example, if the New Juaben Municipal Assembly constructs a dam to store all the waters feeding the Densu River and such storage is considered as reasonable, taking into account the water needs of that district, the riparian owners downstream either in the Akuapem South or Ga Districts cannot complain.

The downstream riparians can only complain if the use by the upstream riparian is considered unreasonable. However, what constitutes an unreasonable water use has not been clearly defined and may depend on each case.

The riparian system as shown above are considered as part of the English common law rules which were applicable in Ghana until the promulgation of the Water Resources Commission Act, Act 522 which has replaced the riparian system with the system of prior appropriation doctrine. It must also be emphasised that the riparian water system works in areas where there is abundance of fresh water resources. Thus, in the United States, for example, while the Eastern states generally apply the riparian system, the Western states, with the proverbial water scarcity generally use the prior appropriation doctrine.

The water resources commission act and introduction of prior appropriation system

Prior to the promulgation of Act 522, there was no central agency responsible for the management of water resources. Acquisition of water rights and water use were under the general common law riparian rules as part of the land law. Apart from the riparian system, it must also be stated that there existed certain state institutions which were given powers to deal with specific water management issues.

Thus, for instance, under the Minerals and Mining Law, PNDCL 153, section 21, the Minister for Mines and Energy has the power to grant a licence to a mining company for the diversion, obstruction or altering of the course of a river within a mining area. Under SMCD 85 which sets up the Irrigation Development Authority (IDA), the Authority also has the power to develop the water resources of the country for irrigated farming, livestock improvement and fish culture. Even though these rights granted to the state institutions amounted to statutory grant of water rights, nothing was said about the ownership of water resources in the country until the coming into force of Act522.

Ownership of water resources in Ghana

Under Article 268 of the 1992 Constitution any transaction, contract or undertaking involving the grant of a right or concession by or on behalf of any person to any other person for the exploitation of any mineral, water or other natural resource of Ghana made or entered into after the coming into force of this Constitution shall be subject to ratification by Parliament. Article 269 also mandates Parliament to establish such other Commissions to be responsible for the regulation and management of the utilisation of the natural resources concerned and the co-ordination of the policies in relation to them (Opoku-Agyemang, 2001).

Unlike water resources, natural resources such as raw minerals and timber, prior to the coming into force of the constitution have been vested in the state. Therefore, until the promulgation of the Water Resources Commission Act, water was the only major natural resources not subject to state ownership. One can therefore say that Act 522 made water resources management consistent with the overall natural resources policy in Ghana.

Despite the vesting of water resources in the state, the Act recognises existing water rights, however such claims are to be submitted within twelve months after the coming into force of the Act. Failure to submit such claims means the extinguishment of those rights. Since the Act came into force on December 31st 1999, one can say that all existing rights not submitted to the Commission on or before December 30th 2000 are extinguished.

Acquisition of water rights and the role of district assemblies

Part 3 of Act 522 provides for the acquisition and use of water resources. Water resources is defined in section 37 of Act 522 as “all water flowing from any river, spring, stream or natural lake or part of a swamp or in or beneath a watercourse and all underground water but excluding any stagnant pan or swamp wholly contained within the boundaries of any private land. For purposes of the permitting process, water uses may be divided into two, namely uses requiring permit; and registrable water uses.

The Water Use Regulations 2001, LI 1692 provides generally ten main water uses in Ghana. These include, domestic, commercial, municipal, industrial, agricultural water uses, power generation, water transportation water use. The rest are aquaculture, environmental and recreational water use.

Section 13 of the Act prohibits the use of water resources without authority from the Water Resources Commission. It provides that no person shall divert, dam, store or use water resources, or construct or maintain any works for the use of water resources except in accordance with Act 522. The Act provides under section 16 for any person to apply to the Commission in writing for the grant of water right. Upon receipt of applications, the Commission is mandated to publish in the Gazette notice of an application and the area in respect of which the application is made. After the publication of the Gazette, a person who claims that his interest will be affected by the grant of water right may notify the Commission within three months of the notice in the Gazette of his objection to the grant of the water right and the person shall specify the grounds of the objection.

The Commission is mandatorily required to consider objections made prior to deciding whether or not a water right may be granted. Apart from the notification of applications in the Gazette, the Commission is under obligation, upon receipt of an application to make such investigations as it considers necessary including consultations with the inhabitants of the area of the water resources concerned.

To enhance public participation in the grant of water rights, Section 5 (2)(b) of LI 1692 provides that in conducting investigations prior to a grant of water rights, the Commission shall ensure public participation especially the people in the area likely to be affected by the proposed use. The Commission is also mandated under Section 6(1) to hold public hearing especially in respect of a water use which may cause dislocation, relocation, resettlement, or in any manner cause the destruction of the natural water resources of the community.

For the purposes of conducting a public hearing, the Commission is to collaborate with traditional authorities of the community, the relevant government institutions, notably the District Assemblies. In the traditional set up of the Akyem Abuakwa Stool, for instance, there is the office of Densu Okyeame (Densu Linguist) responsible for all matters relating to the Densu River. Currently, the membership of the Densu Basin Water Board of the Water Resources Commission (WRC), which is responsible for the management and allocation of resources in the basin, include a representative of the traditional authorities from the Akyem Abuakwa, the source of the Densu River.

The importance of the provision for the consultation with the traditional authorities is to ensure that the customary concepts of management of natural resources are considered prior to the grant or refusal of a water right. It is at this consultative stage that the role of the traditional water priests and priestesses are considered, especially in the demarcation of buffer zones and sacred groves. In the Densu Basin for example, there is an office of a river linguist

With the foregoing, it is clear that even though the Water Resources Commission has the power to grant water rights, it exercises that power in consultation with traditional authorities and district assemblies. No permit can be granted without prior consultation with the community concerned. Thus, it can be argued that even though the ownership in water resources is vested in the State, the traditional role of communities, as custodians of the resources has been maintained.

As indicated above, there are categories of water uses which are exempted from the permitting process but which must be registered prior to use. These uses are water abstracted by mechanical means and use for any purpose where the abstraction level does not exceed five litres per second or subsistence agricultural water use for land areas not exceeding one hectare.

The administration of these registrable water uses is vested in relevant District Assemblies under section 11 of the LI. Under the Regulation, an application for the registration of a registrable water use shall be submitted to the District Assembly indicating the name and address of the applicant, category and level of the water use, water body or system affected and the location of the water use. Where the Assembly is satisfied with the

application, it shall register the use and issue the applicant with a registration number. The District Assembly shall then furnish the Water Resources Commission every quarter a list of all registered water uses in the locality.

The vesting of the administration of registrable water uses in the district assemblies indicates the important role of the assemblies in the management of water resources in Ghana. The reason is that the bulk of water use in the country comes under the registrable uses. This makes it imperative for the district assemblies to understand the concepts of integrated water management and the management of trans-district waters.

Even though a District Assembly may have the power to register water uses within its jurisdiction, it should be noted that most water bodies and basins may straddle more than one or two districts. What should therefore be the relationship of trans-district riparians in the registration of water uses in the recognition of the fact that unsustainable uses of the resources in one district may affect a riparian district.

The management of trans-district waters

As stated above, the various district assemblies and local communities have a major role to play in water resources administration in Ghana. Even though the Water Resources Commission is the central agency for the grant of water permits in the country, it does so in consultation with the assemblies and local communities. On regisrable water uses, the assemblies are the leading institutions in the registration of these uses within their areas. However, as indicated earlier, most water basins in the country are trans-district in nature as it passes through more than one district assembly. In some cases, basins may also be inter-regional. The question is what should be the relationship of trans-district riparian communities.

It must be noted that there has been no attempt to consider the management of trans-district water management. In the conduct of its public hearings, the Water Resources Commission always ensures the participation of all riparian districts for their comments. The question then is, whether the assemblies in exercising their mandate in registering water uses must also consult riparian districts.

The management of transboundary waters is very sensitive in international water law. It is my view that the principles underlying the utilisation and management of international watercourses may be relevant for trans-district water management. Trans-district water is unquestionably very important in the management of water resources in Ghana. This is because, almost, if not all of the fresh surface waters run through two or more districts. The aquifers of the Keta groundwaters are also trans-district in nature. For instance, the White Volta River, apart from being an international water, runs through regions and many districts in the country. This requires that mechanisms be devised to assure that these waters are co-operatively managed if water is not to become a problem for each nation's security.

The UN Convention on the Law of the Non-Navigational Uses of International Watercourses in Article 2 defines an international watercourse (transboundary watercourse) as a watercourse, part of which are situated indifferent states. In the same vein, trans-district water courses may be defined as watercourses part of which are situated in different districts.

Despite their geographical spread, watercourses are considered to comprise a system of surface waters and groundwaters constituting by virtue of their physical relationship a unitary whole and normally flowing into a common terminus. Therefore, the first principle of trans-district water management should be the acknowledgement of the interconnectedness of watercourses within a basin but which may be geographically separated. Water management therefore should be on the basis of a basin rather than apportionment of the waters within an area by a district assembly.

Apportionment is a principle whereby a district declares its sovereign rites over its portion of waters without regard for co-riparians. Even though Ghana is not a signatory to the UN Convention, the drafters of the Draft National Water Policy have provided under the "Guiding Principles for Ghana Water Policy" in paragraph 3.2

(vi) that the principle of adopting the watershed as a planning unit is central to the management of Ghana's water resources.

Another principle of international water law which should be applicable to the management of trans-district water resources is the principle of equitable utilisation of transboundary watercourses under Article 5 of the UN Convention. The effect of the provisions is that trans-district riparian communities shall in their respective localities utilise transboundary watercourses in an equitable and reasonable manner. Such watercourses shall be used and developed with a view to attaining optimal and sustainable utilisation of and benefit from the waters taking into account the interests of the other riparian communities concerned, consistent with adequate protection of the watercourse.

To ensure equitable and reasonable utilisation of transboundary waters, the communities shall co-operate and participate in the use, development and protection of transboundary watercourses. Such co-operation and participation should include both the right to utilise the watercourses and the duty to protect same.

In considering whether a riparian district is utilising the water resources in a reasonable and equitable manner, the following relevant factors should be considered. These include the geographical, hydrological, climatic, ecological and other factors of natural character. Other factors which should be considered are the social and economic needs of a riparian district concerned, the population dependent on the watercourse, the effects of the use or uses of the watercourses in one area on the other, as well as the availability of alternatives of comparable value to a particular planned use. It therefore means that whether or not a use may be considered reasonable and equitable is based on an objective assessment rather than what is subjectively perceived by a particular district.

Another major principle in the management of transboundary watercourse is the obligation of riparian communities not to cause significant harm to one another. In utilising transboundary waters, trans-district riparians shall take all appropriate measures to prevent the causing of significant harm to others. The principle of no harm can be summarised as follows; that a trans-district riparian has an obligation not to pollute and contaminate transboundary watercourses or to deplete the waters. It is also incumbent upon trans-district riparians to notify the other riparians of the adverse effect of projects on transboundary watercourses.

They also have the obligation not to over-exploit to the detriment of co-riparians. To ensure co-operation among trans-district riparians, Article 9 of the UN Convention provides that transboundary states shall on a regular basis exchange readily available data and information on the condition of the watercourses. It is therefore submitted that for the sustainable utilisation and development of trans-district waters, riparian districts should develop a reliable data to support decisions on the sharing of watercourses within trans-district water basins.

It is also submitted that to ensure the sustainability of such water bodies, trans-district assemblies should consider the establishment of joint mechanisms or institutions, as deemed necessary by them, to facilitate co-operation on relevant measures and procedures in the light of experience and capacity of the districts assemblies. It is in the light of these that the Water Resources Commission adopted a basin wide mechanism for the management of trans-district water resources. Currently, two Basin Boards, namely, the Densu and the White Volta Basin Boards, have been set up to manage the resources in the basins. The membership of the Boards, include representatives of all the District Assemblies within the basins and other recognisable bodies, such as women organisations and water user associations.

Conclusion

This paper has attempted to look at the mechanism for the sustainable utilisation and management of trans-district watercourses in Ghana. Even though the Water Resources Commission is the central agency responsible for the management of the water resources in Ghana, the administration of non-registrable waters, for example, places much emphasis on the involvement of the district assemblies. The paper also highlighted the pivotal role of the traditional authorities, especially when it comes to the consideration of application for water rights in their localities.

A critical look at the watercourses of Ghana shows that almost all of them are trans-district in nature. Since there are no provisions in the Water Resources Commission Act or the Regulations made there under on how the various districts are to co-operate in the management of trans-district waters, the paper has considered some of the cardinal principles in international water law on the management of transboundary waters which may be relevant for trans-district waters.

It is submitted that the principles, such as the equitable and reasonable utilisation of watercourses and the obligation not to cause harm to riparian communities, should guide district assemblies in either advising the Water Resources Commission in the grant of water permits or while agreeing to register water uses in their areas.

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Integrated Water Resource Management in Tanzania: interface between formal and informal institutions

Charles. S. Sokile, Willy Mwaruvanda, and Barbara van Koppen

Formal and informal institutions are closely linked and greatly depend on each other. As in other countries, Tanzania recently engaged in a far-reaching formal institutional reform towards Integrated Water Resources Management. This paper focuses on the interfaces and linkages between formal and informal institutional frameworks for water management in Tanzania with a case study of the Mkoji sub catchment in the Rufiji Basin. The paper identifies four major areas of interfaces, namely; centralized and local institutions; modern water rights and customary rights; Water User Associations and informal associations of water users; and formal and informal power relations. The paper argues that although there are some positive linkages between formal and informal institutions, there are also struggles and bickering between the two. The paper highlights the complexity of institutional interfacing. Finally the paper identifies potential ways in which the ongoing reform should consider customary arrangements and provide a better framework for sound management of water.

Keywords: Institutions, irrigation, water right, Tanzania

Introduction

During the past two decades, most Sub Saharan countries have embarked on comprehensive reforms towards Integrated Water Resource Management (IWRM). Most emphasis has been on institutions. Water management policies, legislations and legal frameworks, and organizational setups have been reviewed and redesigned. In almost all countries, River Basin Management approaches have been adopted. IWRM refers to amalgamation of all use sectors, all stakeholders, all prefectures, all tiers and all institutional constituents, both formal and informal, to make a viable and sustainable management system.

The legal and regulatory framework of water management in Tanzania is a mix of written Ordinances that were made by the Legislative Council before independence and the contemporary legislations in one hand, and the set of local, community based practices that are normally determined by local customs, traditions and culture of the water users (Sokile et al. 2003, Maganga et al, 2002, Sokile & van Koppen, 2004). At the national level, water management is predominantly governed by formal institutions, mainly policies, acts and legislations, and related organizations that are judiciously established in accordance with the formal provisions. Yet, legislation is potentially an important instrument to consider informal arrangements. At the basin level, there is a mix of formal and informal arrangements, but the formal predominates, partly due to the fact that informal arrangements are often still quite localized and do not encompasses the whole basin as yet, and partly due to the general failure of formal national and basin-level water management systems to appreciate the informal arm (Sokile & van Koppen, 2004). At the catchment and sub catchment levels, informal institutions gain strength and the patterns of the formal-informal interface become clearer.

This paper draws on a three years research on institutional assessment for water resource management in the Rufiji Basin in Tanzania. The intent of the paper is to share research findings on the point where formal state-based and informal grassroots community-based institutional initiatives for managing water converge and the problems emerging at that interface.

The paper is divided into seven parts. This first part covers the introduction, background to the subject and the methodologies used in the study. The second part covers conceptual issues on formal and informal institutions linkages and the third part covers empirical evidence. First, the interface between modern water rights and customary rights is discussed. This is followed by interfaces between Water User Associations and informal Associations of water users; between formal and informal power relations; and between formal and informal

conflict mitigation measures. The paper also highlights water rotations as a an example of the successful formalization of informal arrangement for water management. Conclusions are drawn in part four.

Background to water resource management in Tanzania

Tanzania already adopted a River Basin Management Approach for water resource management in 1980s when the country was divided into nine basins through Act No.10 of 1981, which was an amendment of the Principal Act No. 42 of 1974. Since then, there have been several initiatives on formal water management institutions. In 1991 the first National Water Policy was launched to augment the changes in the water sector. In 1993, the Rufiji Basin Water Board was launched and the Rufiji Basin Water Office started operating in the same year. Later, in 1997, the Principal Act for water management, i.e. the Water Utilization (Control and Regulation) Act No. 42 of 1974 was amended to accommodate further changes.

Early in 1995 a comprehensive review of Tanzania's water resources policies and institutions was carried out by the Government of Tanzania, World Bank and DANIDA (DANIDA & World Bank, 1995). The following year an inter-ministerial project, entitled River Basin Management and Smallholder Irrigation Improvement Project (RBMSIIP) was launched. The RBM component was hosted by the ministry responsible for water, while the SIIP component was lodged with the Ministry of Agriculture.

The Rufiji basin is the largest of the nine river basins in Tanzania, draining a total area of about 177,420 km^2 (URT, 1995). As shown in figure 1, it is made up of several river systems, the largest and most important (in terms of water utilization) of which is the Great Ruaha River (GRR) system. The Great Ruaha River is draining an area of about 83,979km^2. The Great Ruaha River originates from a number of large and small streams at the northern slopes of the Poroto and Kipengere mountains in the Southern Highlands between Mbeya and Iringa. It flows to the Usangu plain where several other rivers flowing from the highlands join it; namely Mbarali, Kimani and Chimala whereas the small ones include Umrobo, Mkoji, Lunwa, Mlomboji, Ipatagwa, Mambi and Mswiswi rivers. Apart from these southern tributaries, the major tributaries of the Great Ruaha River include the Kisigo River, Little Ruaha, Lukosi and Yovi Rivers. The Great Ruaha River spills onto the Usangu plains, forming the Usangu wetlands (Western-*Utengule* and Eastern-Utengule) and feeding a perennial swamp (*Ihefu*) within the Eastern wetland. It then flows through Ng'iriama (an exit to the Eastern Wetland) on to the Ruaha National Park providing the main water source to the park, and to the Mtera dam, which is the main electricity generation source in Tanzania, accounting for 56% of the runoff to Mtera dam. As it flows down, it is joined by Little Ruaha River before being joined by the Kisigo River. It then passes through the Mtera reservoir, before flowing eastward to the Kidatu reservoir, being joined on the way by the Lukosi and Yovi rivers. From the Kidatu reservoir, it flows into Kilombero Plains before joining the Rufiji River (just above Steigler's gorge).

The Great Ruaha River serves many uses and users as it flows, including irrigation, hydropower generation, livestock, domestic uses, fisheries and aquatic flora and fauna. Irrigation is the major activity and largest water user; it is practiced all year round with supplementary irrigation in the rainy season. Other water-related livelihoods include fishing, livestock keeping and brick making. Problems arise in the dry season when conflicts and disputes over access to water become common. As much water is diverted to the fields for irrigation and brick making, the reduced river flows fail to supply full requirements downstream. This has also brought environmental concerns after the massive mortality and stresses to aquatic ecosystem. Downstream of the Ruaha National Park there are two hydropower stations (Mtera and Kidatu) depending much on the basin for their water for power generation, contributing about 50% of the Tanzania national grid.

Methodology of the study

This study was conducted in the Mkoji sub-catchment, which is a part of the Great Ruaha River Catchment in the Rufiji basin between July 2002 and October 2004. For the sample selection, the catchment was divided into three hydro-geo-agricultural zones, namely the upper catchment, middle areas and the lower plains. In each zone, two villages were selected, making a total of six villages.

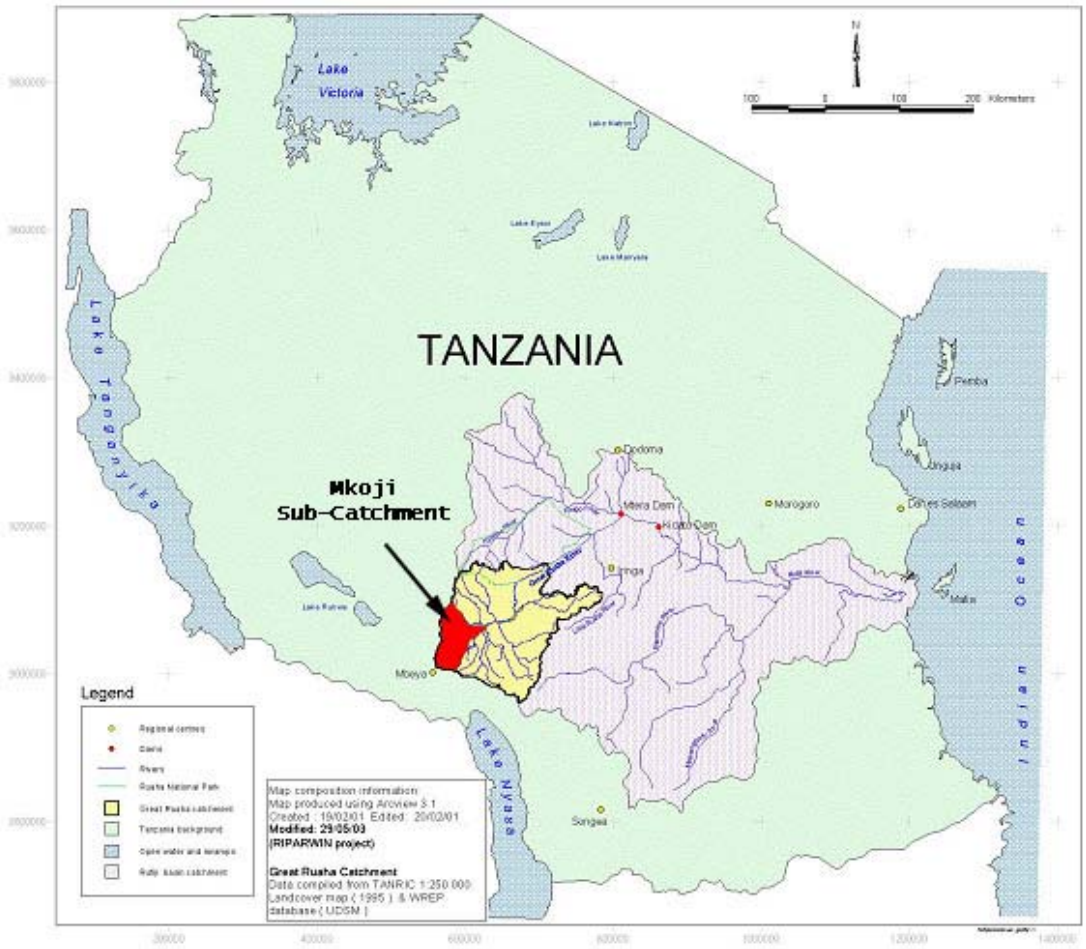

Figure 1. Map of Tanzania showing Rufiji Basin with its river networks and other basins

Three Participatory Rural Appraisals (PRAs) were conducted, one in each zone, to gather exploratory information on the subject matter. Semi-structured interviews were done with identified respondents, followed by focus group discussions in each zone with at least ten key informants and eight district officials from the two districts of the Mkoji Sub catchment were involved.

The study also involved role-play as methodology. The respondents were invited in the role-play River Basin Game[1] workshop. The findings were then analyzed and feed back to the respondents through a subsequent River Basin Game workshop. The River Basin Game is a wooden structure-based game that depicts different zones of a river basin and different uses in each zone. Water users play the game. Marbles are run along river basin to freely follow watercourses and diversions are made using sticks that are designed to represent off take structures. The series of stakeholder workshops acted as fora for triangulation of the findings and platform for pre-testing various way forward for the institutional changes recommended.

The context of formal- informal water institution frameworks

Water management in the developing world is normally a mix of formal and informal institutions at different prefectures and different tiers. The role played by informal mechanisms in water management cannot be overemphasized. Unlike the formal ones, the informal institutions are not purposively designed at one moment. They rather evolve through continuous interaction (Commons, North 1990, Saleth & Dinar, 2004), normally in response to the prevailing situations (V. Ostrom & E. Ostrom, 1972, Saleth & Dinar, 2004).

These gradually and inherently evolving informal institutions have roots in the local communities and are embedded in and interwoven with the existing customs, traditions, norms, beliefs, folklores and tales.

Essentially, informal institutions tend to solicit more deference and recognition at the grassroots level of the lowest tiers of water management. At these lowest institutional tiers, the informal arrangements prevail over the formal ones (Sokile & van Koppen, 2003; 2004) at the interface with the formal set up.

Informal institutions may gradually become part of the formal arrangements and elements of formal institutions may taken up by the informal, depending upon a range of factors in a given context. The reality of the coexistence and interdependence of the two arms is inescapable in the water sector. In fact, informal institutions are partly extensions and local level translations of formal institutions; and formal institutions are also derived from and depend on the informal ones for their stability and strength (Saleth & Dinar, 2004).

Generally, there is a huge body of empirical literature on institutions, arrayed from old institutionalism (Commons, 1934, Tool, 1977, Davis and North, 1970 Bromley, 1985) and neo-institutionalism (North, 1990) to modern transaction cost theories of institutions and agency and contract theories (Saleth and Dinar, 2004; North, 1997, Eggertsson, 1990,). Nonetheless, the large body of literature on water management institutions displays inadequacy on their treatment on the institutional interface (Saleth & Dinar, 2004) especially on the formal- informal frontier (Sokile et al, 2002, 2003; Sokile & van Koppen, 2004). There is generally a paucity of research findings on the convergence between formal and informal institutions.. The research agenda on recent water reforms certainly tends to bypass and ignore the contribution of customs, norms, traditions and local initiatives to the management of water, throwing the baby with wash water and forgetting to 'collect fire from the ashes' (Sokile & van Koppen, 2003; 2004).

Institutions are diverse and dynamic. They involve constitutional code, organizational order as well as normative/ customary behavioral changes. Whereas the constitutional order characterizes the rule-making process that includes the making of the national constitution and the related governance framework, the organizational arrangements are determined by the institutional code that is characterized by by-laws, regulations, associations, contracts and conventions that are created within and by the constitutional order (North, 1981; 1990; Douglas, 1986 and Ostrom, 1990). The normative behavioral code, on the other hand, relates to cultural values, customs and norms that legitimize the institutional arrangements and constrains the behavior of individuals and groups in the society.

As institutions change, societies adjust themselves accordingly to adopt the changes (Shah et al, 2000, Williams, 1999). According to Williams (1999), the adaptation is captured in a four level phenomena as shown in Figure 2 below, the adaptation starts with the social embeddedness level which encompasses customs, traditions, mores and religion. At this level, there is a very gradual change. This is followed by the second level that involves the institutional environment of a society that encompasses formal rules, constitutions, laws and property rights. The third level deals with issues of governance that basically covers motivations related to the former levels, i.e. how the incentives and enforcement are aligned. The last part focuses on resource allocation and employment and is concerned with getting the prices of transaction right.

Interfaces between formal and informal institutions

Central level: The Ministry of Water and Livestock Development

Although the thrust of current water resource management in Tanzania is to implement water management at the basin level, the central ministerial level continues playing a significant role in water management and the coordination of all nine basins in the country. However, the current national structure does not provide for the requirements of the new National Water Policy (2002). The central level is responsible for developing, disseminating, monitoring and evaluation of the National Water Policy 2002(URT, 2002). A new structure is being proposed in the draft new Water Resources legislation (2004, draft). Further, the National Water Policy is also translated into three separate Legislations: the Water Resources Development Act, the Rural Water Supply Act and the Urban Water Supply Act. Of the three sets of legislation, the Water Resources Development Act (2004, Draft) concede to the administration of both informal, local and customary water use permits (formerly water rights) and to the formal ones and, unlike earlier legislation, provides for a possible interface between the two systems of access to water.

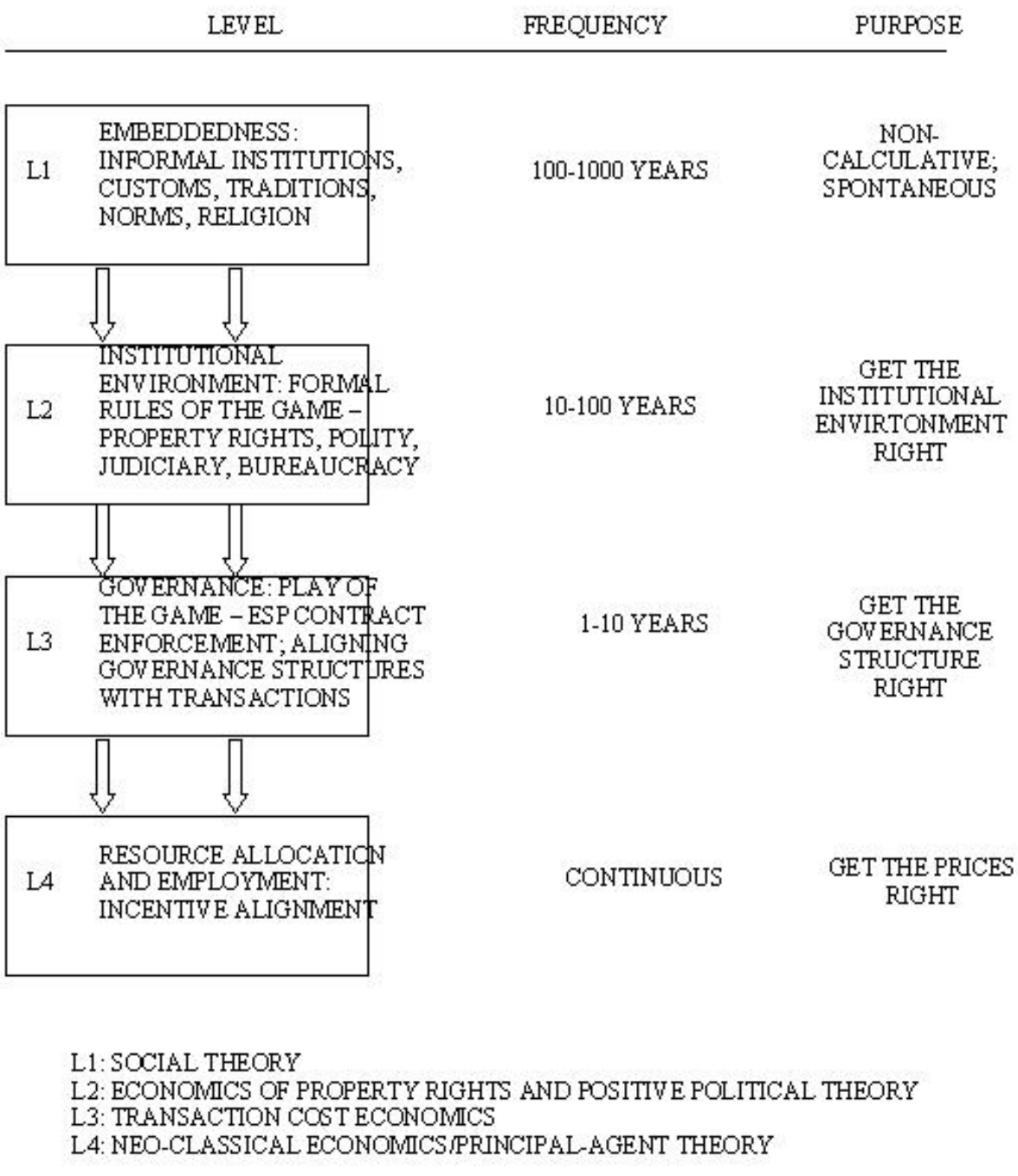

Figure 2. Formal-informal inter-linkages in water management institutions

Basin level: The Rufiji Basin Water Office

Like the national ministerial level, the basin tier is dominated by formal arrangements. The elements of informal institutions are few and petite. The Rufiji Basin Water Office (RBWO) was set-up as per Act No.10 of 1981, for mandates, tasks and roles provided in this Act for Basin Water Boards. The basic tasks of the basin office are:

- Allocate and regulate the existing and new water rights within the basin;

- Monitor water availability, water quality and water uses in the basin
- Control water pollution
- Collect the water user fees as per water law and Regulations
- Mediate and resolve water conflicts within the basin.
- Establish Water User Associations as per Act No. 42 of 1974

Although the Basin Water Office does all these functions with little or no involvement of the local communities, there is a potential of associating the informal institutions in managing water by jointly undertaking the above functions. However, the capacity of the Basin Office is limited in terms of its human and financial resources, given the extensiveness of these tasks in the largest basin of Tanzania (Sokile et al, 2004). The RBWO thus depends on the collaboration between a number of existing and new institutions in the execution of these tasks on the ground, especially for the regulation and distribution of river water flows during the dry season; the collection of water user fees; the construction of new infrastructure, and most importantly, the mediation and resolution of water conflicts.

Potentially, essential synergies can be tapped by aligning formal and informal institutions. For example, the Basin Water Office may solicit support from the informal institution in the villages. Grassroots water users may be mobilized to discuss and agree on the amount of water to be allocated to various uses/ users and then be empowered to oversee and regulate the allocation. Similarly, the village leaders- formal or informal- may be involved in monitoring water availability and quality through gauge reading and through development and implementation of bylaws for pollution prevention. However, apart from some isolated initiatives along these lines, the partnerships between the RBWO and local communities are still largely to be forged.

Catchment level: The Mkoji sub catchment

At the catchment and sub-catchment levels, there is a fair interface between formal and informal institutions. The formal arm of water management in the Mkoji sub-catchment comprises two district councils, and several wards. Three to seven villages make up a ward. Wards are important tier in the governance structure. Although not specifically formed for managing water, wards influence water management considerably. The Ward Development Committees frequently pass bylaws that impact on sanctions and penalties that seek to guide water allocation and quality.

Each ward has a Ward Councillor. Ward Councillors are very influential in the villages and in water resource management. Ward Councillors represent the community members who elected them into power in the district council. Owing to their electorate, councillors, seeking to please their voters tend to be more informal and highly interact with informal institutions, which influence water management. Councilors in the lower zones of the Mkoji sub-catchment have, for example, been reported to mobilize downstream water users for negotiating for water upstream, mobilized funds for domestic water supply, pushed by-laws for water management at the District Council, and mobilized communities towards the formation of WUAs.

This is not to say that the functioning of Ward Councillors is smooth or perfect. They may also battle with popular opinions and sometimes counteract customary arrangements. For example, in 2002 in the upper catchment of the Mkoji sub-catchment, Ward Councillors had to struggle very much with the idea of cutting of alien riparian tree species, especially Eucalyptus *spp*, as per the directives of the Mbeya rural district council while the customs object cutting trees. The tag of contention here is that, while customs bar people from cutting riparian trees, the formal institutions tend to support the same.

Although district, ward and village councils may deliberate on decisions that affect water management, a specific mandate for this lies within the Rufiji Basin Water Sub-Office at Rujewa, the main town in the Mbarali district. The sub-office coordinates water management through Water User Associations (WUAs) and village committees in case where there are no WUAs. Generally, there is no specific provision for taking on board the local and customary views into the formal councils and committees. Occasionally, however, the basin sub-office has used informal community leaders in implementing some of the water management activities, especially in resolving water conflicts. The results have been very impressive.

Local Level: The Village and Below

The lowest tier of formal institutions in Tanzania is the village level. The informal arrangements for water management are more elaborate at the grassroots level. There, formal and informal initiatives for managing water clearly co-exist. Each village has a village assembly of all adults, which elect 25 representatives to form the Village Council. The Village Council operates through three mandatory committees, which are vested with responsibilities for handling daily affairs of the village: the Finance, Economic & Planning Committee; the Social Services and Self-reliance Committee and the Law and Order Committee. Water sub-committees fall under the Social Services and Self-reliance Committee.

The strength and functioning of the village sub-committees differ from one village to another, and similarly, their specific intervention into water affairs also differ depending on the availability and the levels of demand on the water resource. In places where irrigation is carried out only in dry season or is not carried out at all, like in the villages in the upper catchment, the water sub-committees are relatively redundant. There, the informal arrangements through customs, taboos, and traditional rainmakers tend to be more popular and respected. Conversely, in the middle zone of Mkoji sub catchment where wet season irrigation is highly practiced, there is an active formal Water User Association, which handles both domestic and irrigation water management.

Seemingly, whenever the formal village sub-committees are weak, there is a stronger informal institution that assumes the roles and fills the gap.

Interface between modern water rights and customary rights

Mkoji sub-catchment is a true replica of the current water reform in Tanzania, including its key component: the need to obtain water rights and pay water fees. The new Water Policy (2002) requires water users to mobilize and organize themselves into associations, especially into WUAs, to apply for water rights, and to pay application and user fees. Many users at the Mkoji sub-catchment have already formed WUAs and have applied for the rights. Specifically, the law bars abstraction of water for whatever purpose without a prior paper-based license or water right.

Irrigation has been practiced in some parts of the sub-catchment for many decades through traditional canals, which demanded no paper-based formal rights. In some cases some users had applied and acquired for the paper-based rights individually. With the new institutional arrangement, there are contradictions within the formal institutions (i.e. modern vis-a-vis existing institutions) on the one hand; and between formal and informal ones on the other hand. The formal contradiction is especially strong because the Water Policy (2002) requires the formation of new institutions (formation of WUAs, water charging mechanisms, water rights, etc) within an existing institutional landscape. The challenge here is to align the new formal initiatives consistently with the former formal initiatives as well as to shape the interface with the informal arrangements. The contradiction arises that, whenever the new formal institutions have tried to build on the existing ones, there has been duplication of efforts and sometimes collision of roles. For example, in Imezu and Itewe villages in the upper catchment, both a new WUA and an existing formal water committee want to control water allocation.

Another problem in cases where formal mechanisms have provided explicit support to initiate and form new institutions, is that existing structures have been ignored, relegated or bypassed altogether, so that new institutions have being inadequately integrated in, and accepted as part of, the existing institutional landscape. Thus, the institutional reform risks failing completely. For example, in the middle and some parts of the upper Mkoji, water users who used to access water through traditional canals repeatedly deject recent arrangements that require a paper-based license and a modern concrete intake for farmers to attain water rights.

In contrast, trying to reshape the new IWRM institutions with a minimum of external support entails the risk that the new institutions are essentially again the existing ones, with the institutional reform resulting in a mere "cosmetic" operation of changing labels (Sokile et al, 2004).

A last contradiction between the formal and informal observed is the lack of any mechanism to ensure access of water to those who are yet to apply for modern water rights, especially pastoralists who are further downstream of the sub catchment.

Interfaces between Water User Associations and informal associations of water users

The National Water Policy recognizes informal water user associations since 1981 as the lowest level of water management institutions. Generally in Tanzania, small associations or cooperatives of water users cover areas commanded by a single furrow, one domestic water supply scheme (group or single) or various furrows in a given village or ward. Some were registered. Since the reviving of water rights and fee payment in the mid-1990s, these newly registered Water User Associations (WUAs) are not only expected to play an important role in the operation and maintenance of local water infrastructure, but also in the allocation and administration of water rights and the collection of water fees.

The new formal WUAs operate through a set of formal principles, including attending meetings, electing leaders, developing by-laws etc. In the case of operations, however, several challenges have been noted. For example, attendance to WUA meetings is far less than expected, especially among women and the levels of abidance to the WUAs by-laws are low. In Ikhoho and Idunda villages in the upper Mkoji sub-catchment water users feel more committed to the customary arrangements for access to and allocation of water than to the WUA driven ones.

Before the onset of WUAs, water users had other means of associating among themselves. Locally, water users associate in labour-based farming groups called *njaanwa* in the Mkoji Sub Catchment; local groupings for implementing water rotations called *kamati ya zamu* and other dynamic local groupings among water users. Unlike in WUAs where membership is long-term and compulsory and requires subscription, membership to the local groupings is open and dynamic. There are also duty-based canal cleaning groups called "*Maendeleo*" or *'msaragambo'*. The communal associations were fluid enough to contain water demand variations in dry and wet seasons and had adequate mechanisms for sanctioning allocations. Normally, a culprit would be dissociated from peers and /or would be wished bad omen.

Formal WUAs have little contact to informal local associations of water users. Furthermore, the formation of WUAs has neither built on nor encouraged the existing local associations of water users. While the formation process of WUAs requires users to come together, hold meetings, write constitutions, pay monetary membership fees and apply for registration with some supra institutions, the informal associations simply require one to have a stake in the water use undertaking.

Interface between formal and informal power relations

Tanzania abolished chiefdom officially in 1961 at its Independence. In some places, however, traditional and customary leaders have been co-existing with the new formal local governments and are somewhat influential. In the upper zones of the Mkoji sub catchment, among the local ethnic group of the Wasafwa, there exist an array of traditional leaders called *mwene* (Pl. *mamwene). Mwene* is a chief to this ethnic group. Each *mwene* commands an area of roughly a new ward. Powers of *mamwenes* are more elaborate in water and natural resources management where they enforce customs and traditions against cutting riparian trees, cultivating on water banks and polluting water bodies.

Both customary and formal institutions display power and influence power relations at various degrees. Formal institutions display powers by the virtue of the state and formal rule of law, while the informal ones acquire power through customary influences and beliefs. Since the formal arrangements are backed by state power and the rule of formal law, those who incline and abide with the state are at an advantage. For example, the water requirements of the users who hold formal water rights and pay for water fees are paramounted compared to a local user who wished to access water.

In the Mkoji sub-catchment, local informal associations are influential, powerful and attractive to the local communities. Most people feel a stronger sense of identity and belongingness than in the formal set ups. In some places, formal institutions draw from informal ones and vice versa. For example, informal leaders may play a role like the formal ones. In the upper Mkoji catchment, and in other parts of the Mbeya rural district, *mamwene* serve as chairmen of the Environment Subcommittee in the village government. Whenever such arrangements have existed, there have been some pros and cons to the same. As part of the formal village government, traditional leaders enhance compliance of the rule of law and of water management practices. However, placing *mamwenes* as chairmen of a sub committee contradicts free and fair election and democratic principles (Sokile & van Koppen, 2004), and skill-based leadership.

In Inyala ward for instance, a power struggle exists between the water committee, informal canal committees and the newly introduced WUA. The new WUA has been introduced, yet the village water committees had not been repelled. Yet, water users seem not be getting institutional satisfaction from either of them; thus they have formed their own canal committees. This is a challenge to the bureaucracy that may not have listened to the institutional aspirations of water users. The message accrued there is: are we forming empty institutions? Do the newly formed formal institutions address the current challenges of water management? Or do they simply perpetuate further power struggles while 'managing' water resource at the ground level?

Interface between formal and informal conflict mitigation measures

Formal and informal institutions interact appreciably in conflict resolution at the local level. Most disputes on water are resolved informally at the lower levels before they erupt into serious conflicts. This conflict resolution dynamic is not normally outspoken. Six tiers are identified where informal-formal conflict resolution takes place (Sokile & van Koppen, 2003, 2004):

- One to one level between the victims: both parties speak out and agree on resolving the conflict.
- Local elders level: normally those who are well known to both parties and who can appreciable solicit trust among the parties.
- Canal committee level: this is a semi-formal level since the committee members are in some places elected among water users and in other areas they assume responsibilities *de facto*.
- Customary village leaders level: there is a village reconciliatory committee (*baraza la usuluishi*), which is made up of elected/appointed elders and resides over local conflicts, especially on resources, marriages and related cases.
- Ward level: the Ward tribune, while established formally through election , it operates according to customary principles, focusing on reconciliatory rather than punitive rulings.
- Basin and/or catchment level: the Rufiji Basin Water Office and the sub-offices mitigate conflicts when local solutions have failed and where the claimants do not wish to go to courts of law.

Local water users prefer informal routes over formal ones because they feel a greater sense of identity and hope for justice than they would experience in the courts of formal law where decisions are based on 'I loose-you-win' or 'I win-you-loose' principles. Such parallel forums provide an effective conflicts resolution institution for managing water conflicts at a lesser cost.

The formal arm of conflict resolution involves village committee meetings, primary courts and district magistrate's courts, in cases where the conflict has escalated higher, and the Basin Water Offices in cases where they need a formal forum but are afraid to go to the courts of law. Apparently, the costs of abiding with formal and informal institutions in water management differ. The formal route is expensive, time-consuming and less trusted among local communities (see also, Maganga & Juma, 2003; Sokile et al, 2002; Sokile & van Koppen, 2003; Sokile & van Koppen, 2004). People have more reverence for informal customary institutions than formal ones.

The other formal-informal interface in conflict resolution mechanism is explicated by the Primary Courts. Although the Magistrates Courts Act, 1984, establishes Primary Courts statutorily as a local judicial system, the system tends to appreciate the strength of customary law and practice. For example, the interpretation of customary law in Primary Courts is effected through the system of Court Assessors who sit in Primary Courts.

The Court Assessors are drawn from local community elders who are considered wise enough to advice the Primary Court magistrates. The legislation requires that in every proceeding in the Primary Court there must be at least two assessors. The study found out that in all courts, there were two or more assessors from different ethnic groups (SMWUC, 2001; Sokile & van Koppen, 2003; 2004).

Water rotations: A successful case of formalized informal arrangement for water management

Water rotations (popularly known as *zamu* in the Usangu plains) provide an interesting and successful interface of formal and informal institutions in water management. In the Mkoji sub-catchment, along long stretches of streams, both water users who have formal water rights and those who do not are increasingly realizing that the available water resource is not enough even for the water right holders.

In the peak of dry season (September - November), all water users come together and agree on how to share water through rotational arrangements (*zamu*). This is done without external formal interventions. A weekly roster is set and agreed upon and each use prefecture, commonly referred to as *wana-zamu,* i.e. the bearers of the rotation appoints members to make up a loose committee to oversee the water rotations. Each prefecture takes the rotation further to make up an intra-canal rotation. The table below shows such rotation schedule between intakes, taking the case of three villages along Mlowo River in the middle Mkoji sub catchment. With exception of the Ipatagwa and Motombaya improved irrigation schemes that receive water throughout the week even during this period, the remaining intakes are scheduled in a weekly rotation.

Table 1. Water use rotational roaster in the Middle Mkoji Sub Catchment

No	Day	Who irrigates
1	Monday	Motombaya irrigation scheme (Formal water rights)
2	Tuesday	Motombaya irrigation scheme (Formal water rights)
3	Wednesday	Langwira pasture farm (Formal water rights)
4	Thursday	Langwira pasture farm (Formal water rights)
5	Friday	Mhwela village (Informal access to water- customary right)
6	Saturday	Mwatenga and Kilambo villages and NARCO ranch (both formal and informal rights)
7	Sunday	Water flows free in the river. No abstraction

Source: Sokile & van Koppen, 2003; 2004

The informal rotation groups (*zamu*) and labour groups (*njanwaa*) have a great potential of contacts and mutual interaction, although this potential is yet to be realized. The groups interact in terms of membership and places where they operate. There is however, no mechanism as yet for synchronization of their undertakings, for example, for making sure that when it is the turn (*zamu*) of water users to access water, they also work together (*njanwaa*) in the fields to maximize water use without any losses. This vital interface mechanism requires further examination for maximum benefit.

Interfacing formal and informal institutions in water management: no easy task!

In sum, shaping a harmonious interface between the formal and informal institutions for water management may not be that simple. Institutional contradictions, power struggles, bypass and duplication of activities are likely to be encountered, unless a specific effort is made to foster harmony within and between the multiple institutional frameworks.

Gaining effective centralized and decentralized water management institutions requires formulating interface mechanism that will ensure sufficient contacts and overlaps without unnecessary contradictions. This also concerns the vertical interactions between the ministerial level and the basin levels, the basin level and catchment levels, and the catchment levels and villages levels. There is a still a considerable gap in knowledge on the processes through which the informal arrangements feed into and sustain the formal water management systems, which requires elaborate further study. Critical focus areas are grassroots levels, especially the village level, the WUAs level and the Primary Courts level.

In the Primary Courts for instance, the court ruling is based on the decisions of the majority of Court Assessors and the presiding Primary Court Magistrate (Maganga & Juma, 2002; Sokile & van Koppen, 2003). The Court Assessors translate the underlying principles and dynamism of customary law in that particular case and advise the magistrate to come up with a sound judgment on the matter. A key challenge faced here is the question: customs of which ethnic group should be followed? For example, the ethnic composition of Court Assessors in Chimala, Ilongo and Igurusi Primary Courts in Mkoji sub-catchment encompasses more than four ethnic groups, which all have more or less different customary water management principles (Odgaard 1999; Maganga and Juma, 1999; Sokile et al, 2002). Such complexities have also been seen in cases where *mamwene* have been incorporated in the formal village government.

Conclusions and recommendations

Institutions are wide, complex and varied. They range from formal, well-established policies and legislative and organizational set ups that are interwoven from central, basin, catchment to local levels on the one hand, and an elaborate, complex customary institutional mix embedded in local informal relations, which involves customs, traditions, norms, culture and local practices on the other hand. Both formal and informal arms of institutions are important in water management and they are fully interdependent. As such they display a wide array of types of interfaces. Various interfaces of formal and informal institutions have been illustrated above, including the interfaces between centralized and local institutions, formal water rights and customary rights, Water User Associations and informal associations of water, formal and informal power relations, and the complexity of institutional interfacing. As displayed in these cases, especially at the grassroots level, the formal ones may not be successfully operational without the informal ones, and vice versa.

There are no full-fledged mechanisms as yet to better align the formal and informal. In some cases there is only superficial contact among similar institutions resulting into uncoordinated interventions, bypass and duplication of efforts, while in other cases there are troublesome overlaps resulting into power struggles and collisions in operation mechanisms. This implies a challenge to the bureaucracy in the ongoing water reforms that new initiatives may frustrate ongoing efforts or may not bring an added value whatsoever.

Formal institutions i.e. policy and legislation on water resources management should assign more room for the other side of the coin - the informal side, as it has a lot to offer for achieving today's water management imperatives. Water managers at different levels should appreciate formal-informal interfaces and encourage the better coexistence of the two arms at various tiers and prefectures of water resources management.

There is a need to build the capacity of water managers, users and other stakeholders on the importance of both formal and informal institutions at the catchment and grassroots level specifically, where the formal-informal linkages are clearer. There is also a need for a comprehensive study to examine the formal-informal institutional linkages and interface mechanisms especially at the grassroots level. The successful cases of the formal-informal institutional interfaces should be encouraged and be emulated for better use elsewhere.

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Indigenous systems of conflict resolution in Oromia, Ethiopia

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This paper describes the role of the Gadaa system, a uniquely democratic political and social institution of the Oromo people in Ethiopia, in the utilization of important resources such as water, as well as its contribution in conflict resolution among individuals and communities. It discusses ways to overcome the difference between customary and statutory approaches in conflict resolution. A synthesis of customary and statutory system of conflict resolution may facilitate a better understanding that will lead to improved management of resources, which are predominant variables for the socio-economic development of the country. It suggests that top-down imposition and enforcement of statutory laws that replace customary laws should be avoided. Instead, mechanisms should be sought to learn from the Lubas, elders who are knowledgeable in the Gadaa system, about the customary mechanisms of conflict resolution so as to integrate them in enacting or implementing statutory laws.

Keywords: Gadaa, indigenous institution, Oromo, conflict resolution, Awash River Basin, Borana.

Introduction

Ethiopia is said to have abundant potential water resources, all emanating within its territory. Nevertheless, water resources scarcity in the country is to be understood in terms of its spatial and temporal distributions. This is related to the issue of water resources accessibility, which in turn relates to people's ability to obtain water to satisfy their needs, taking into account factors such as time and distance to collect water, rights of access and costs. Wherever there is water, land suitable for agriculture may not be available and vice versa. Therefore, although Ethiopia, with over 1,700 m^3/s per capita water availability is not a water stressed country, the spatial and temporal variability of water limits the country's development, management and equitable distribution.

The level of water supply in Ethiopia is among the lowest in Africa. Above all, its availability in the dry season is of great concern to the majority of rural populations across the arid and semi-arid parts of the country where villagers travel long distances to the nearest sources of water after local sources have become exhausted as a result of prolonged dry season. For example, in the Awash River Basin, spending 4-6 hours on a daily basis for getting water is not uncommon for a rural household living far from a river course (Desalegn et al., 2004). In the Dollo and Filtu districts of the Liban Zone of the Somali Regional State, there is hardly any perennial source of water between Genale and Dawa, the two main rivers in the regional state. Therefore, villagers in places like Filtu must rely on water tankers from Negelle (127 kilometers away) or have to fetch water from a borehole at a distance of 50 kilometers, once the nearby but highly polluted local pond dries out (Ahrens and Farah, 1996). Situations prevailing in the other zones of the Somali Regional State and in the Borana Zone of the Oromia Regional State are also the same. Historically, the strong bias towards urban development means that the provision of water supplies in rural areas is particularly low. A great majority of Ethiopians use unsafe and polluted water, and are at risk for a great variety of water-borne diseases (Flintan and Imeru 2002).

As a result, both intra- and inter-ethnic conflicts over the use of natural resources are commonplace in the drylands of Ethiopia in general and in the Awash River Basin and the Borana and Liban zones in particular. Dessalegn (1999) argues that in Ethiopia, development, not water scarcity, is a more important source of conflicts between the rural communities. Conflicts that ensue from development-oriented undertakings include: 1) disagreements between different users over the allocation of waters, land rights, or maintenance issues; 2) conflicts between users and the authority responsible for the project over inappropriate design of infrastructure, peasant relocations, water charges, or management issues; 3) conflicts between project beneficiaries and non-beneficiaries; and, 4) conflict between donor agencies and the recipient country over design, management, environmental impact, and financial issues.

A number of studies have attributed the cause of conflicts in the Awash River Basin to the introduction of various large scale commercial agricultural schemes along river courses and the opening up of the Awash National Park on the land predominantly used by pastoralists for grazing during the dry season and during droughts with little concern for those already inhabiting the area. As a result, competition between pastoralist groups increased as they moved in search of pasture and water supplies. In addition, access to key dry season springs is lost (Flintan and Imeru 2002). Many of the development projects in the basin involve investment by international organizations with a top-down approach, bypassing the customary laws of the indigenous communities. They further argue that not all the local people, mostly Afar, were bypassed by developments in the Awash valley. Some participated to a certain degree and as a result gained some economic benefits, such as employment on the state farms. However, "such trends sowed the seeds of further conflict within Afar political structures as a growing Afar capitalist class undermined traditional clan elders. This was a factor in the violent conflict that was manifested in the Dergue period".

In general, resources are the major sources of conflicts between clans and ethnic groups in both the Awash River Basin and the Borana Zone, while territory is another important source of conflicts in the former. Consciousness of clan 'territory' is more intense nearer to the Awash River, whereas exclusive rights to land are less important farther from the river. This indicates how water resources are important to the community and their connection to this particular river. The Alledeghi Plain, for example, is considered open grazing land for all Afars. However, since traditional rules to restrict resources use have broken down, the Alledeghi Plain has been heavily overgrazed (Flintan and Imeru, 2002).

During the past *Derg* regime, Peasant Associations (PAs) were the powerful instrument of formal conflict resolution. They had their own judicial committee to oversee conflicts and had the power to impose decisions through fines and imprisonment. Under the current regime, *Kebele* Administrations (KAs) are setup, bringing together two or three of the former PAs, with similar judicial powers to the latter. In addition, Governmental Teams are established to represent a maximum of 50 households, thus bringing State institutions to an even more local level. Conflicts relating to natural resource management are nowadays often reported to the Governmental Teams and through them to the KAs.

There also exist various traditional institutions in the country that have their own customary methods to settle conflicts. In this regard, the *Gadaa* system of conflict resolution is one that deserves attention. This institution is well respected by the Oromo society at large in the country. If this indigenous knowledge can be harnessed, then it is thought that it can be a means through which sustainable development can be achieved (Watson, 2001). However, there exists a loose collaboration between these statutory and customary institutions in the management of natural resources and conflict resolution.

This paper presents the role of the *Gadaa* system in conflict resolution through better management of one of the scarce natural resources--water. Historical conflicts over the use of natural resources in the major pastoral areas of Oromia, Awash River Basin and Borana, and local methods of resolving these conflicts are reviewed. The organizational structure of the *Gadaa* system is explained and potential interface between this institution and the statutory method of conflict resolution is discussed. Special emphasis is given to the *Gadaa* system of Borana Oromo. In this area, the *Gadaa* system of governance is still active compared to other areas of the Regional State. In addition, the area is facing various degrees of water scarcity and is the target of various water development projects in the country, and is therefore an area very susceptible to competitions and conflicts.

Review of conflicts in Oromia over the use of resources

Natural resources-based conflicts are part of the fabric of local communities as individuals compete for scarce resources: social groups perceive themselves as having incompatible interests. Those who depend on a particular resource, but are unable to participate in planning or monitoring its use are marginalized. Conflicts also arise when local traditional practices are no longer viewed as legitimate or consistent with national policies, or when entities external to a community are able to pursue their interests, while ignoring the needs

and requirements of local people. In the conflicts that ensue, often between parties of very uneven power, it is not only the environment that suffers but also the whole society (Constantinos, 1999).

Generally, pastoral lands in Ethiopia experience low annual precipitation, averaging between 400 to 700 mm. In many areas drought occurs on a regular basis. As a result, pastoral land use depends on scarce water supply from the rivers. In addition, access to water has been severely curtailed in recent years due to changing land use practices and attempts to develop large-scale agriculture and irrigation schemes in upper catchments (Flintan and Imeru, 2002). This paves the way for the occurrence of conflicts. The causes of the conflicts are perceived differently in the two major pastoral areas of the country--in the Awash River Basin and in the Borana Zone of Oromia Regional State, which are discussed below.

Awash River Basin

Awash is one of the ten main river basins in Ethiopia (see Figure 1), and it has a total drainage area of 110,000 km^2. The river originates at an elevation of about 3,000 masl in the central highlands of Ethiopia, west of Addis Ababa, and traverses a total length of about 1,200 km flowing northeastwards along the Rift Valley into the Afar Region where it terminates in Lake Abe at an elevation of 250 masl (Wagnew, 2004). The Awash River Basin is divided into three agro-climatic zones, namely, the Upper, Middle and Lower Awash. Mean annual rainfall ranges from 160 mm over the northern lowlands to 1,600 mm at Ankober in the highlands northeast of Addis Ababa (Flintan and Imeru, 2002). Because of its strategic location, good communication facilities, and available land and water resources, this basin is currently the most developed part of the country in terms of irrigation with approximately 69,000 ha under irrigated agriculture (Ministry of Water Resources, Ethiopia, 2001).

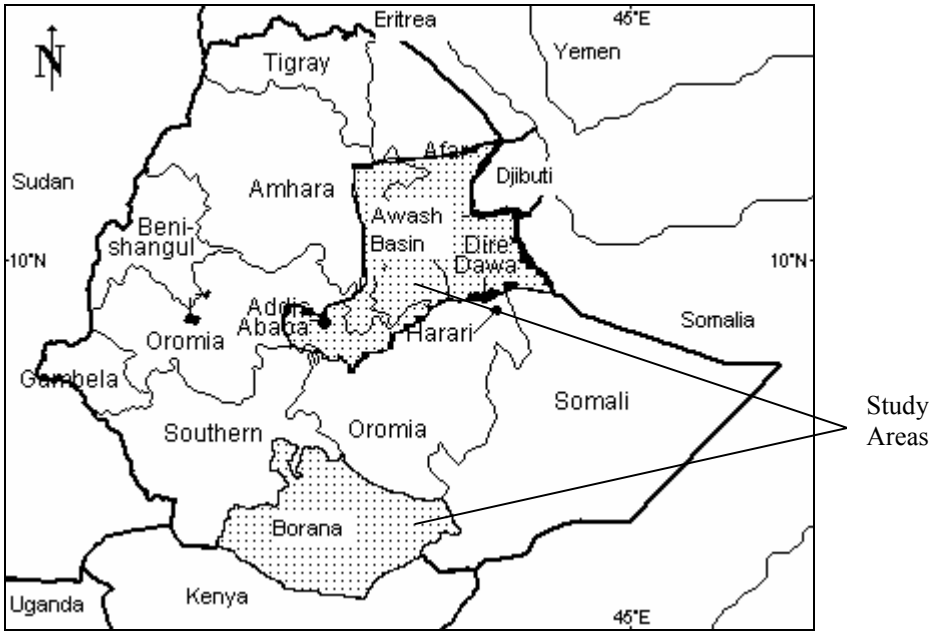

Figure 1. Location map of the study areas

Source: Modified from Martins (2004)

Conflicts prevailing in the basin take two forms: (a) conflicts within the local community over the use of natural resources and (b) conflicts between the local community and the governmental and/or non-governmental organizations due to the expansion of development projects on grazing lands previously held by pastoralist communities. Agricultural and tourism development within the basin has taken place without due consideration for the needs of the local community. This has caused shrinking of the grazing lands of the local

pastoralist community and limited access to water resources, which in turn results in competition among the users thereby leading to conflicts. The most common inter-ethnic conflicts are between the Kerreyu and Ittu Oromo communities and the Afar and Issa communities.

Grimble and Wellard (1997) categorize conflicts in terms of whether they occur at the micro–micro or in the micro–macro levels, i.e. among community groups or between community groups and government, private or civil society organizations. Micro–micro conflicts can be further categorised as taking place either within the group directly involved in a particular resource management regime (e.g. a forest user group or ecotourism association), or between this group and those not directly involved (Conroy et al., 1998). Desalegn et al. (2004) note that there are often conflicts in the smallholder irrigated areas within the Upper Awash valley over the use of water resources. The conflicts are mostly among the beneficiaries of the same irrigation project and are mainly over the allocation of water from the communal canals and sometimes between the beneficiaries and non-beneficiaries of the projects. Warner (2000) however reports that giving greater emphasis to the poor is not necessarily conflict-free as it raises the possibility of new tensions between project beneficiaries and excluded groups. Resource-based poverty reduction projects, which depend upon those excluded from the project's immediate benefits for their success, are potentially vulnerable to such tensions.

Bassi (2003) presents the feelings of the local community (Kerreyu elders) about the establishment of the Awash National Park in the year 1969 as follows:

> "Haile Selassie [Ethiopian emperor] sent his ministers. They asked us whether we agree to the establishment of the Park or not. Their question was not genuine, since they had already taken all the land without consulting us. It was intended to produce a pretext to arrest us as usual. We told them that we do not give all of our land since we have no other place but part of it. We, then, agreed out of fear, obviously, to give the land east of Fantale Mountain for the park. They agreed to give us land west of the Fantale Mountain. We accepted since we could not do anymore. When they prepared a map of the park and began to protect the land, the thing was different. They reversed the agreement: The map of the park included areas west of Fantale Mountain, which they previously agreed to give us. They have begun to evict us. They built a camp in our settlement areas. We repeatedly asked the government and the park to respect our joint agreement but no one listened to us…"
> Source: Karrayu elder quoted in Buli Edjeta (2001: 86) (cited in Bassi (2003)).

Similarly, Flintan and Imeru (2002) note that conflict is ongoing in the Awash River Basin, much of which is inter-ethnic and inter-clan in nature. Conflicts and changes to patterns of resource use have led to widespread social impacts. Further, they report a detailed summary of the relationship of clans with each other and with the government. They describe the basin as a fractured political landscape reflecting clan and regional differences and a lack of relation between governors and many of the inhabitants. List of clan or ethnic groups evicted and displaced from their lands as a result of substantial investments in the basin is summarized in the document. They concluded that the capture and closure of key resource areas used by pastoralists is a critical parameter that defines conflict in the basin today.

Borana zone

The Borana Zone, located at the southern edge of Ethiopia, is one of the 13 zones of the Oromia Regional State (see Figure 1). The zone is made up of thirteen districts called *Worada*, divided between two agro-ecological zones–the semi-arid lowlands to the south and the more humid lands at higher altitudes to the north (Tache and Irwine, 2003). The mean annual rainfall across the districts varies between 500mm and 700mm with an overall average of 648mm. The mean maximum and minimum temperature of the area varies from 25.26°C—28.79°C and 14.19°C—18.11°C, respectively (Luseno, et al., 1998).

The Borana Oromo are numerically the dominant ethnic group inhabiting the Borana lowlands. The lowlands are made up of six districts (Liban, Arero, Yaballo, Taltalle, Dirre and Moyale), and extend across the border into northern Kenya. Average annual rainfall is less than 600 mm (Coppock, 1994) and surface evaporation is high. There are two rainy seasons: the main season, *ganna* (March-May) and the minor season, *hagayya* (Sept-

October). The land is largely covered with light vegetation of predominantly pod-yielding Acacia species of low forage values. The ecological conditions favour pastoralism more than farming.

Traditionally the area is endemic to conflicts between rival pastoral groups over resources. During the 1990s, the frequency and magnitude of conflicts has increased. For instance, in 2000, three major conflicts occurred between the major pastoral groups (Boran versus Garri, Merehan versus Digodi, Digodi versus Boran). Note that the term 'Boran' is used in this paper to refer to the people of Borana. These conflicts in combination with severe drought resulted in the death of hundreds of people and dislocations (Dejene and Abdurahman, 2002).

There are serious tensions and sporadic violence between Garri returnees from Kenya, who currently claim to be a Somali clan, and the Boran (Tache and Irwin, 2003). Groups that are either allied to or have close associations with the Boran include members of other Oromo groups and the Konso who have settled in the Borana lowlands. Conflicts, although not unknown, tend to be relatively minor and rapidly resolved through traditional conflict resolution mechanisms.

According to a UNDP report (Ahrens and Farah, 1996), while Borana and Liban zones in Ethiopia are prone to drought, adjacent areas in neighbouring Kenya and Somalia are even more likely to suffer from water scarcity. During the times of complete failure of rainy seasons in northern Kenya and Southwest Somalia, there are often apparent influxes of pastoralists from those countries into Ethiopia searching for water and pasture. These situations lead to conditions where local people and "guests", often related by trans-border kinship and sharing common languages and cultures, have to compete for the use of the few perennial water resources. Similarly, Watson (2001) provides a thorough account of conflicts between Somali groups and the Boran over the use of natural resources.

Coppock (2001) used results from 120 group interviews collected in 1998 to quantify how inhabitants across northern Kenya and southern Ethiopia perceive and rank various risks to their livelihoods and found that reliable access to food and water are the most common sources of risks in the area, which are related to drought, market inefficiencies, or insecurity.

Traditional conflict resolution mechanisms

Traditional conflict resolution mechanisms in Africa are generally closely bound with socio-political and economic realities of the lifestyles of the communities. These mechanisms are rooted in the culture and history of the African people, and are in one way or another unique to each community. The customary courts rely on goodwill of the society to adhere to its ruling (Rabar and Karimi, 2004). As a part of African socio-political setting, the major conflict resolution mechanism in the two pastoral areas is also found to be through indigenous system.

Gadaa system in Oromo society

It is reported that in both the Awash River Basin and Borana areas elders in the community form a dominant component of the customary mechanisms of conflict management (Desalegn et al., 2004; Watson, 2001; Dejene, 2004). This is directly related to the socio-political functions of *Gadaa* system, a system of an age-grade classes that succeed each other every eight years in assuming economic, political and social responsibilities. A complete *Gadaa* cycle consists of five age-grades. The authority held by the elders is derived from their position in the *Gadaa* system. According to *Gadaa*, those people who have entered the *Luba* grade (individuals in the expected age range of 40-48) are considered to be elders. Therefore, the *Luba*s (elders) settle disputes among groups and individuals and apply the laws dealing with the distribution of resources, criminal fines and punishment, protection of property, theft, etc. Following *Luba*, men automatically retire from *Gadaa* and move into an advisory role known as *Yuba*. By then they receive a great deal of respect, as wise experienced authorities and repositories of law, but their decisions are no longer final as they had been. They turn the bulk of their attention to private family businesses or religious activities while their sons enter *Gadaa*, the public service.

Slight differences are observed among the Oromo communities across Oromia in the way they practice *Gadaa*. In this and the following sections, more emphasis is given to the Boran *Gadaa* system. The Boran have kept the system more intact than the Oromos in the other areas because of their relative isolation from external influences. The system is still functioning in Boran and the UN Office for the Coordination of Humanitarian Affairs (2004) reports that Guyyoo Goba is due to become the next *Abbaa Gadaa* (the leader of *Gadaa* or president) for the Boran. He will have a team of advisers, who collectively comprise the legitimate leadership of the Boran. However, the UN office further indicates, the Boran and their leaders have now come to realize that the outside world is encroaching on their very way of life.

There are divergent views among scholars on the functions of *Gadaa* institutions. For Legesse (1973, 2000) the *Gadaa* assumes military, economic, political and ritual responsibilities in the leadership of the Oromo society. In contrast, others view the *Gadaa* as less politically relevant, playing ritualistic roles only (Hinnant, 1978). However, Tache and Irwin (2003) argue that *Gadaa* is more in line with the first assessment, although recent weakening of the institution, particularly post 1974, means that change in the influence of the *Gadaa* may increasingly be leading to its' playing a more ritualistic function.

Oromo public life was administered through the *Gadaa* system. To deal with *Gadaa* as a system is to see it as an arrangement of interacting parts. Understanding any one part requires relating it to the whole, i.e., knowing how the overall system is fitted together. Each man born or adopted by Oromo parents was automatically placed for life into a ready-made pattern of positions and moved through it performing various services for the public good and also receiving certain privileges. An important distinction in *Gadaa* is between (1) groups of men who move through a series of stages known as *gogessa* and (2) the stages or periods themselves. In this paper the Oromo term *gogessa* is used for groups of men, although other writers have used the terms "classes" or "age-sets" and the term "grade" is used for the stages (or categories, or eight-year-long periods) through which all *gogessas* must pass. So the men are divided into *gogessas* and the time is divided into grades.

Gadaa parties (gogessa)

Gogessa can be likened to different political parties of a society. The society is divided into five *gogessas*, resembling a party in the sense that they define the conditions of competition and recruitment for political office. Every Oromo is born to one of the five *gogessas* and children always belong to their fathers' *gogessa*. *Gogessa* provides a list of contenders for *Gadaa* leadership, who are elected every eight years. *Abbaa Gadaa* and his councillors are elected by each *gogessa* as the highest authority in the *Gadaa* system. The five *gogessa*s are named differently in different parts of Oromia. For the purpose of discussion, the following five *gogessa* names most commonly found are used in this article:

- *Birmaji*
- *Horata*
- *Bichile*
- *Duuloo*
- *Roobalee*

Gogessa is perpetuated by a series of new generations, each successively emerging every 40 years.

A segment of generations that make up each *gogessa* is known as *Luba*. Each *Luba* is identified by a prominent person in the generation set. Every Oromo must be able to identify his *Luba* affiliation and hence his *gogessa* in order to compete for a *Gadaa* office.

Gadaa grades

Gadaa through history came to organize Oromo social life around a series of generation grades which assign obligations as well as rights to all the males in the society. Among other functions, the separation of men into grades is a division of labour. Each man, as part of a permanent group, the *gogessa*, contributes his labour power in different capacities to the society as a whole and is prevented (or discouraged) from settling permanently until he has completed the cycle. The grades were also periods of initiation and training as well as periods of work and performance (*Gumii Bilisummaa Oromiyaa*, 2000).

A man and all of his brothers are in the same party, for example, *Birmaji*, regardless of the differences in their ages. Together they move through the hierarchy of grades, a complete *Gadaa* cycle of forty years behind their father. As sons are born to a man, they are held back and do not enter into active participation in the *Gadaa* system until their father retires. For example, if a man is *Birmaji*, his sons are initiated into the first grade of *Gadaa*, when he finishes the fifth grade. If a man continues to have children until he is very old, those sons will enter *Gadaa* and move through with their elder brothers, even if they enter at the middle of the cycle as infants. However, this might have impact on the proportion of able-bodied work-force that the society requires in each *gogessa*. In this case, *Gumii Bilisummaa Oromiyaa* (2000) argues that adjustments have been made by adoption and by amendment to keep the greatest number of able-bodied men into the grades that require the maximum of physical strength to meet the needs of the nation, e.g. for herding livestock and for military activities.

Role assignments to each gogessa

The roles and rules attached to the age-grade system is the most important element that regulates the *Gadaa* system. Every Oromo of specific age-grade is expected to perform a certain function according to specified rules and regulations. The number of age-grades is cited differently in different literatures. For example, *Gumii Bilisummaa Oromiyaa* (2000) reports five *gogessas* in the whole cycle of *Gadaa* system whereas in Constantinos (1999) and Workneh (2001) six *gogessas* are recognized, regardless of the stages following *Luba*. These differences seem to be the result of the divergence in the writers' comprehension of the timing when one is allowed to get married and to have children. For example, Constantinos argues that men are allowed to marry at the stage of *Raabaa Doorii* but not to raise children until they enter the *Gadaa* stage (above 40) at which *Danissa*, a transition ceremony, would be held in his honour. In any case, an individual in the first age-grade (*Dabballee*, in the case of Constantinos) is not considered to be in the *Gadaa* system as a result of which there are only five active *Gadaa* grades. They are sons of the men who are in power, the *Luba*, and are not allowed to enter active *Gadaa* grade until their father retires from the cycle. In this article, the six age-grade system (including *Dabballee*) along with their corresponding designations and role assignments is adopted as presented in Table 1.

The entire *Gadaa* presidium, consisting of nine members, is called '*Saglan Yaa'ii Boran*' (nine of the Boran assembly). If the *Gadaa* officials fail to carry out their duties, the *Caffee* can replace them by another group from among the same *Gadaa* class, which proves its democratic nature of governance; *Caffee* is the Oromo version of parliament. There are three levels of assemblies such as inter-clan, clan and local *Caffees*. All male members of the society who are of age and of *Gadaa* grade are allowed to elect and to be elected. The *Gadaa* leaders are elected on the basis of wisdom, bravery, health and physical fitness (Workneh, 2001).

However, it is worth noting that *Gadaa* is a male-oriented socio-political and cultural system and excludes the Oromo women's role from its political and military structures. Taking the case of the Boran, Legesse (1973) states the following gender relationship between men and women:

> Men are in control of military and political activities. Only men can engage in warfare. Only men take part in the elections of leaders of camps or of age-sets and Gadaa classes. Men lead and participate in ritual activities. However, ritual is not an exclusively masculine domain: there are several rituals performed for women. In these and a few other instances women do take an important part. Women are actively excluded from age-sets. They are therefore heavily dependent on men for most political-ritual services and for all activities connected with the defense of Boran camps, wells, herds, and shrines.

Hussein (2004) gives a detailed account of *Ateetee* rituals, practiced only by women. Whenever natural disasters occur, women gather and perform the ritual. Oromo women used to practice *Ateetee* as a way of strengthening their solidarity and as a tool to counter atrocities staged against them by men. The *Ateetee* practiced by women is one part of a belief system that women are intermediary figures between *Waaqa* (God) that represents nature and the physical world or humans. The *Ateetee* ritual shows that in the traditional Oromo society, men are functionally dependent on women in many ways (Legesse, 1973). Similarly, Megerssa (1993) asserts that there was a check and balance mechanism built into the *Gadaa* system by which *siiqqee* was institutionalized and women formed parallel organizations of their own which actively excluded men.

Table 1. Different Gadaa grades with their corresponding roles

Stage	Designation	Age limit	Remarks	Specific Role in Society
1.	*Dabballee*	0-8	Child is born	None, immature, sons of *Gadaa*, only symbolic role as mediator between God and humans.
2.	*Foollee* (*Gaammee xixiqoo*)	9-16	Naming ceremony at home or Nura Shrine in Liben if *Ilmaan jaarsaa* or *Ilmaan Kormaa*, respectively	Some look after small stock around *Ollaas*
3.	*Qondaala* (*Gaammee gurguddoo*)	17-24	Intensification of the 2nd stage	Takes livestock further away from *Ollaas* and begins drawing water from *Eelaas*
4.	*Kuusaa*	25-32	Politically significant	*Luba* elects its leader and is named after him. Nucleus of Gadaa leaders (Adula councils) emerge
5.	*Raabaa Doorii*	33-40	This and the *Kuusa* grade constitute a period of preparation for the assumption of full authority	Important military wing of the *Gadaa* system. Conducts raids; protects Boran territory and resources against enemies. Men allowed to marry.
6.	*Gadaa* (*Luba*)	41-48	Politically the most active	Leadership grade-the most important of all stages; *Luba* assumes power/office; transition is marked by leadership ceremony; Visit all Borana regions, settle serious disputes and convene assemblies.
7.	*Yubaa* I	49-56	Retirement stage	Advisory role in the society; they receive a great deal of respect as wise experienced authorities and repositories of law.
8.	*Yubaa* II	57-64	Retirement stage	
9.	*Yubaa* III	65-72	Retirement stage	
10.	*Gadaamojjii*	73-80	Marked by rites at different sites	Senior advisor
11.	*Jaarsa*	Above 80	Stage of old age	At a stage to be cared for

Adopted from Constantinos (1999) and Workneh (2001) with slight modifications. Grade designation and age-limits are slightly different in the two sources.

The role of *Gadaa* in resolving conflicts over the use of resources

Apart from their political significance, the *Gadaa* leaders play important roles in natural resources management. While the rules and regulations laid down by the *Gadaa* tradition must be respected by all councils of elders, any problem regarding resources use which could not be solved by these elders would be handled by the higher *Gadaa* leaders. Watson (2001) describes the role of *abbaa Gadaa* in natural resources conflict resolution as follows:

> The abbaa Gadaa is seen as the figurehead of the whole of Boran, and is often described as the President. As well as performing rituals, matters are referred to him and his council when a decision cannot be reached at a lower level. When conflict breaks out between ollas (the smallest unit of settlement consisting of 30 to 100 warraas—households) or araddaas (small group of ollaas, usually two or three only, who may cooperate together on their grazing pattern), or maddaas (area surrounding one water source), then the abbaa Gadaa will rule on the case. If there is conflict between ethnic groups, then he will be called in to help make peace. As the abbaa Gadaa is responsible for dealing with matters of concern to the Boran, and

as matters of concern are often related to access to the resources (water, land, and forests), the abbaa Gadaa is the highest level of institution of natural resources management in Borana.

Management of water, as a common property, in Boran remains relatively intact to date (Tache and Irwin, 2003). Despite the collapse of most of the indigenous institutions of Boran over the last thirty years, those concerned with the administration of water sustained their importance (Homann et al., 2004). They give detailed accounts of Boran's water management strategy under drought conditions as follows:

- *Wet season:* after rainfall, open water sources are used and wells are closed,
- *Dry season:* herds are successively shifted to more distant ponds and traditional wells are re-opened to preserve water near the homestead,
- *Progressing dry season (water scarcity):* the drinking frequency of cattle is gradually reduced to one day (*dhabsuu*), two days (*limmaalimma*), and three days (*sadeen*).

The co-ordination of access to water is also linked with tasks of cleaning, maintenance and rehabilitation. For example, cattle are restricted from entering the water sources by fencing-off the sources and making them drink water hauled into troughs made from clay and cement (*naaniga*).

Traditional Boran clearly defines the rights to water for each of the various sources (wells, rivers and ponds). According to Watson (2001), the following are the most important sources of water (*madda*) which are highly regulated:

- *Hand-dug shallow ponds (Haroo):* A pond is the property of an individual or his direct descendants who initially excavated it and the person is called *abbaa Konfi*. Rights to use the pond are obtained by providing labour for the maintenance of the pond. Although the property of the *abbaa Konfi*, the pond is administered by the local elders.
- *Wells (eelaa):* The wells are highly regulated in Borana. They are divided into two types, *adadi* (shallow wells) and *tulla* (deep wells). The *tullas* are famous because they can reach a depth of 30m and water is drawn by a row of people standing one above the other and passing containers of water. There are nine *tullas* throughout the Borana zone, which contain water throughout the year and they are known as *tullan saglan* (the nine wells) (Helland, 1997).

Watson (2001) lists the following additional sources, where access is mainly opportunistic:

- *Natural ponds* containing water throughout the year known as *bookee*
- *River*
- *Temporary ponds*
- *Collection of rainwater*

The opportunistic nature of access to these water sources implies that the right of access to the water depends, above all, on the reliability of the water supply (as they are either temporary or occasional sources) and land ownership on the shoreline of the sources (the riparian rights doctrine). Watson (2001) reports that rights to water from these sources have been privatized and are sold by individuals and groups in some cases in Borana. The access to these sources is mainly characterized by poor institutional development and little regulation. Tache and Irwin (2003) also maintain that occasional water sources (surface water from rain) have the most unreliable supply and no restrictions whatsoever are imposed in accessing them.

On the contrary, hand-dug ponds and wells are regulated and they are the most important sources of water as they are the most reliable and labor–intensive types. The wells are managed by a council of the clan group which includes a retired *hayyuu* (special counsellors or individuals who hold ritual authority to judge (Watson, 2001)), the *Jallaba* (a local lineage of clan elder or special messenger (Homann et al., 2004)), the *abbaa Konfi* (trustee of each well), the *abbaa herregaa* (the coordinator of water use and maintenance) and other members. An officer responsible for the day-to-day supervision of watering procedures, including the maintenance and cleaning of wells, enclosures and environs, is assigned at a meeting of clan group council known as *Kora eelaa*. Any violation of the customary rules of water use and maintenance is referred to and discussed by the *Kora eelaa* in the presence of the culprit.

Watson (2001) discusses a complex web of entitlements that enable an individual to gain access to water from any particular well and the turn that person is given in the rota for watering animals. It depends on the membership of the clan of the *abbaa konfi* and on contribution to the labour of constructing the wells. Animals are given water according to a strict rota: the *abbaa konfi*, the *abbaa herregaa* and then other clan members according to their seniority in the clan. In addition to these entitlements, the Boran have a set of laws called the *aadaa* and *seera* in which it is forbidden to deny someone access to water or to ask payment for it. The *aadaa* and *seera* (Boran laws) are rehearsed at a meeting that is held every eight years in Borana. This meeting is known as *Gumii Gaayoo* (meeting of the multitude). In general, the ideology and social relations of Boran society are based on *Nagaa* Boran (the peace of the Boran). Oromos define peace not as the absence of war but as a proper relationship within the localities and with God, *Waaqa*. The relationship between different clans, villages and households or any other social group is based on cooperation and mutual respect. Where a dispute arises, it is soon resolved through mediation by a council of elders (Constantinos, 1999).

Tache and Irwin (2003) also present how the diverse local communities, both Oromo and non-Oromo, in the Borana zone of Oromia co-exist under the traditional negotiated systems of shared management of natural resources. Conflicts, although not unknown, tend to be relatively minor and rapidly resolved through the traditional conflict resolution mechanisms. Similarly, Dejene (2004) reported the effectiveness of the *araaraa* institution between the Karrayyu Oromo of the Upper Awash and its neighbouring ethnic groups like the Afar and Argoba. *Araaraa* is nothing but the process of conflict management involving individual clans within and outside the community. It is basically handled by the council of elders in the community and thus associated with the *Gadaa* system and called *Jaarsummaa* in some localities. The term *Jaarsa* is the Oromo version of elder and thus *Jaarsummaa* is the process of reconciliation between conflicting individuals or groups by a group of *Jaarsaas* (elders).

Relationship between statutory and customary institutions

Watson (2001) provides a thorough account of the professed interests of various NGOs in working with Boran indigenous institutions as a bridge to accessing and enabling the community in helping themselves. In general, it is underscored that the state and the NGOs show a strong commitment to working with indigenous institutions as a means of achieving development. However, no pragmatic collaboration is being realized between the statutory and the customary institutions. Bassi (2003) states that the Boran political/judicial/governance system has never received any formal recognition from modern Ethiopia. It is still important in regulating interpersonal relations in the rural context and access to pastoral resources, but it is as a whole losing relevance due to the overall state-imposed allocation of land resources to the newcomers. Consequently, the newcomers increase pressure on the water resources by claiming a substantial share of the existing water rights and often neglecting the local rules and agreements. Similarly, some scholars shared their experiences of the prevailing relations between the formal government units for political administration, the *Kebele* Administrations (KAs), and the *Gadaa* institution in the Borana zone (Homann et al., 2004; Tache and Irwin, 2003). The following excerpt is taken from Tache and Irwin (2003):

> A herder bringing his cattle to an area would traditionally negotiate grazing rights with the *araddaa* council. The decision would be made according to the number of cattle already grazing in the area and forage availability. If the area were already being used to its maximum potential, the herder would be asked to explore other areas to graze under the traditional grazing management system. However more recently, in the event of such a decision, herders who are "refused" access may now go to the KA and gain legal permission to graze their animals in the area.

Tache and Irwin (2003) further argue that the KA officials, youngest community members, alien to the indigenous system and inexperienced in rangeland management, are appointed and given powers of decision-making at the local level. Today, the KA officials are linked to the territorial administration of the rangelands. They operate against the advice of the elders, who are delegated clan representatives and responsible for a more flexible organization of the rangelands. This has caused conflicts between generations and disagreements within and among the communities.

Conclusions and recommendations

Both inter- and intra-ethnic conflicts over the use of natural resources are common in the two major pastoral areas of Oromia, Awash River Basin and Borana. Such conflicts are usually settled by the local elders using the principles of the *Gadaa* System. According to the *Gadaa* age-grade system, individuals in the age range of 40-48 are called *Luba* and are considered to be elders with a social responsibility of keeping peace and stability within the local community. The relevance and application of this indigenous institution in dealing with conflicts that may arise over the use of natural resources have been assessed by many scholars.

There is a loose collaboration, if any, between this customary institution and the government in dealing with conflict resolution between individuals and communities. The government fails to appreciate, collaborate and complement the traditional methods of resolving conflicts. Limited understanding of the role played by the *Gadaa* system by the state has diminished the efficacy and relevance of this customary institution in conflict management in Oromia in general and in Borana in particular.

We propose that there should be an increased collaboration and networking between the statutory and customary institutions of governance. In particular, the state should recognize and support the customary courts and enforce their rulings. In Borana, the customary laws are often more important than statutory laws and are relied upon in deciding access rights to natural resources and in resolving conflicts. Neglect of these norms and laws may have negative consequences for development policy of the nation in general and the local community who rely on them in particular. A 'systematic combination' of customary and statutory institutions in the development and management of natural resources may facilitate cross-cultural understanding, thereby improving the socio-economic development of the country. However, enforcing the statutory rules on the local community without due consideration for their indigenous norms and values should be avoided on the side of the State. Access to the local communities should be established through customary institutions.

In Boran tradition, natural resources management and conflict resolution are combined; and as a result of the great respect it receives from the local communities, the customary institution is the best institution to deal with the operation and management aspects of natural resources governance. Therefore, full authority should be given to the indigenous (*Gadaa*) institution in making decisions regarding access rights to scarce natural resources. The involvement of government bodies (KA officials) in decision-making processes about natural resources (such as over-ruling the indigenous institution's decision) should be avoided and should be limited to the development aspect. In general, the whole effort of the government should be directed at natural resources development leaving the management and operation aspects to the traditional institution. Yet, the local community should be given a say in the development projects starting right from the planning stage. Further, the role of local customary institutions in water resources management and conflict resolution should be spelled out clearly in the Water Resources Policy of the country.

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Translation of water rights and water management in Zambia

Paxina Chileshe, Julie Trottier and Leanne Wilson

The human right to water was articulated in the UN Economic and Social Policy Documents. At the national level this approach is challenging to adopt, especially for the least developed countries. The limited financial resources of countries like Zambia compound these challenges. Water rights in Zambia follow a common law property rights system. Common law is mostly applicable in urban centres whereas customary law is more applicable in rural areas. The dual application of the laws makes the translation of water rights at grassroots level an interesting case to explore. Two different rural areas will be used to highlight the issues faced by the communities in managing their water resources and their perceptions of water rights. The cases also bring out the role of the state and other actors like NGOs and community based organisations in water management.

Key words: Human rights, water rights, customary law, common law, grassroots

Introduction

Field evidence from Zambia will be explored in order to highlight some of the mechanisms that generate discrepancies between legislative and de facto management of national water resources. Such mechanisms hinge upon the key issues of water rights, equity, gender and second order water scarcity. Zambian law recognises a human right to water to some extent although this is not codified within the Constitution. Field observation reveals some discrepancy between the practices in place and the ideals foreseen by a human rights approach. This paper explores these divergences.

The paper uses two case studies, one in the Western Province of Zambia near Mongu and the other in the Northern Province near Mbala (Figure 1). The Western Province of Zambia is mostly a flood plain and there are large volumes of water during the rain season mainly coming in from the North Western Province. The Northern Province of Zambia also receives lots of rainfall averaging about 1138 mm annually compared to 808 mm for Western Province (SADC Website). The study site in Western Province has an irrigation scheme that was set up to encourage the local community to increase their agricultural productivity and food security. The case study explores issues of equity and gender in water management and customary land and water laws. In the Northern Province the study site is a village that is experiencing both first and second order water scarcity for various reasons. The different orders of scarcity are elaborated on in the case study.

Zambia is a country with a population of about 10 million people. It is one of the most urbanised country in Southern Africa and receives sufficient rainfall overall. It is a country with limited national resources like most third world countries. Taking a human rights based approach to water would prove challenging for Zambia as the government may not be able to keep its promises for all citizens. The rights based approach has only been alluded to in the National Water Policy and the Water Act. This paper starts with a look at human rights and the human right to water. It then turns to water rights in Zambia and customary law relating to land and water in the Western province of Zambia. This case study is followed by the second case study in Northern Province, which looks at the different orders of water scarcity.

The human right to water

Internationally, basic needs water uses are now formally recognised as a human right, and the right of access to clean and affordable water and sanitation was acknowledged in the Dublin Principles (Budds and McGranahan, 2003). Previously these rights were enshrined within the 1989 Convention on the Rights of the Child, and were implicit within many other agreements (Gleick, 1998)[1]. Water as a human right has been most actively pursued under the terminology of economic, social, and cultural rights, but trends towards 'participation' have more firmly bracketed water rights within the discourse of civil and political rights. In any case, the UN has always considered these two branches of 'rights' as indivisible and inalienable.

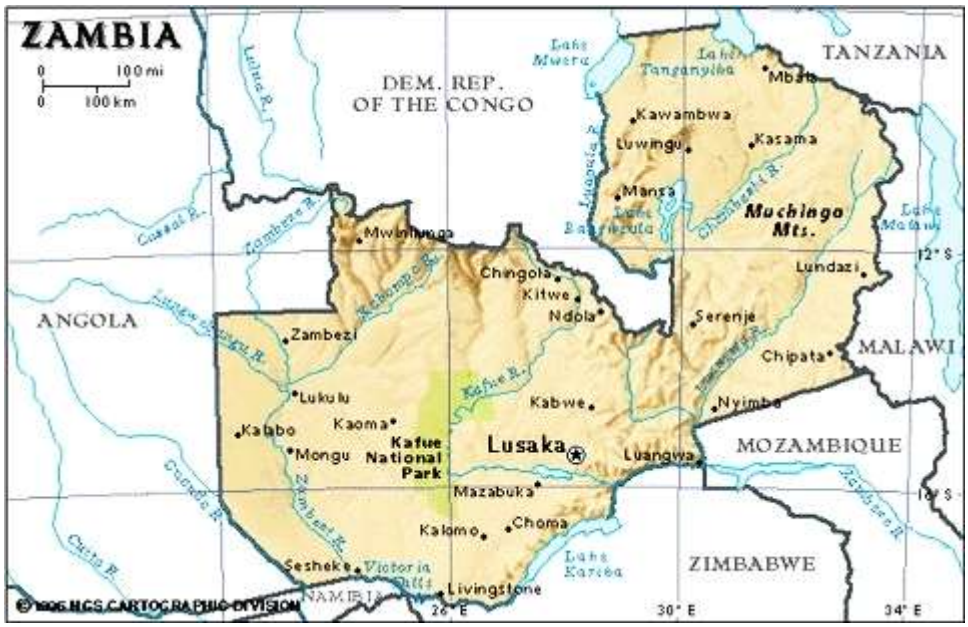

Figure 1. Location of study sites with water bodies in close proximity

Source: http://www.afriprov.org/images/zambia.jpg (Accessed on 20/03/03)

Gleick (1998) maintains that although human rights more generally have been inadequately upheld, the concept of a human right to water would provide 'the' water community with a useful tool in tackling one of the most elemental failures of development. Conversely, Robinson, (2002) implicates the notion of water as a human right in the exclusion of poor and rural communities from water service provision (heavily subsidised or negative cost recovery management for already connected households does not generate investment revenue). While privatisation of water management is not a major issue in rural Zambia, donor priorities and the presence of non-governmental organisations (NGOs) impacts upon the governments ability to ensure and fulfil a legislative human right to water.

Water rights

Water rights clearly exist independently of their correlation or otherwise with the various human rights agreements. Hodgeson (2004) defines a legal water right as a right to:

- Abstract or divert and use a specified amount of water from a natural source;
- To impound or store a specified quantity of water in a natural source behind a dam or other hydraulic structure; or
- To use water in a natural source

However, even official Zambian water laws and policies exhibit pluralism. Meinzen-Dick and Bakker (2001) refer to a hierarchal distinction between use and control rights, in both legislative and customary rules, categorising access, withdrawal, exclusion, management, and alienation rights as the components, which equate to a 'bundle' of water rights. Actual ownership is defined as the totality of this bundle.

- *Access rights:* the rights to enter a defined physical entity. This might apply to recreational water use (like swimming), where the main 'use' is simply to be in the water, and generally refer only to non-consumptive, in-stream uses.
- *Withdrawal:* the rights to obtain the benefits from that entity by taking out some of the flow.
- *Exclusion:* the rights to determine who will (or will not) have access to the resource.
- *Management:* the rights to regulate use patterns, thus transforming the resource and potentially altering the stream of benefits from that resource. Management rights also provide the ability to define access or withdrawal rights.
- *Alienation:* the rights to sell, lease, or bequest rights to the resource.

The ownership of all water in Zambia is vested in the President (as opposed to the state) though legal pluralism exists within state law. The use, diversion and apportionment of all water is assumed to fall under the Water Act (1948) which provides for the ownership, control and use of mainly surface water (Republic of Zambia, 1949). The Act also makes a clear distinction between private and public water. Private water is defined by the riparian principle. A landowner in this case would include the President, and a mortgager or lessee. Public water means all water flowing or found in or above the bed of a public stream, whether visible or not, including lakes, swamps or marshes. A public stream refers to either a watercourse or a dambo (seasonally flooded wetland) of natural origin, forming part of a natural drainage system, where water flows in ordinary seasons where such water is not private water.

There is also a classification of primary, secondary and tertiary uses of water (ibid). Any person shall have the right to the primary use of public water that is found in its natural channel or bed at such places to which access may be lawfully had. This could be reasonably interpreted as an implicit human right to water encoded in law. Primary use of water is defined as the use of water for domestic purposes and the support of animal life. Secondary use of water refers to the use of water for the irrigation of land and pisciculture. Tertiary use is defined as the use of water for mechanical and industrial purposes for the generation of power. Primary uses of water have priority where conflict over water uses and allocations arise.

The Water Act is the main legislation that deals with water allocation in Zambia. Water rights are obtained through the Water Development Board under the Ministry of Energy and Water Development (MEWD). The water rights are issued for volumes above 500 cubic metres. Lower volumes are considered domestic and not applicable for water right application. The Water Board co-ordinates the water rights at the national level especially for large-scale water users like water suppliers, industrial users and commercial farmers. For the large-scale users, property rights and common law are prominent. Zambia however has a dual law system. Customary law is more prominent at the local level. The next section looks at the role customary law plays in water management especially when related to land tenure.

Customary Water Rights

Water management in Sefula, Western Province, is not circumscribed by the Water Act, and is governed as a riparian system. The land in Sefula is classified as traditional land that is under the custody of a traditional ruler on behalf of his people. Customary land tenure is exercised for a period of 14 years following authorisation by the chief. The Induna's (local chief) authorisation gives the applicant a right of occupancy to the land. The Induna uses his own discretion to allocate the land. The Litunga, the paramount chief of the Lozi people who form part of the Barotse Royal Establishment, selects Indunas. The position of the Litunga is hereditary and he inherits some Indunas from the previous Litunga. Control of land rights was legislated via a separate treaty signed by the Barotse Royal Establishment with the British Protectorate. Mamdani (1996) details similar forms of legislation in his critique of the bifurcated nature of the contemporary postcolonial African state.

Traditionally owned land is not subject to state law though it amounts to around 70 per cent of Zambia. Therefore traditional water laws and regulations are in actual fact more significant than the formal water law. In traditionally governed systems, water rights are riparian, which is juxtaposed with the non-priority permit system that the government administers on public water. The occupier of traditionally governed land must register the water bodies on their land and any intended use for the water body including estimated daily volumes. The register is held at the land and deeds register. Unfortunately enforcement of the registration is rather weak and most traditional landowners do not adhere to the legal requirement. Following Meinzen-Dick and Bakker's (2001) approach, an example of water rights in Sefula, Western Province is illustrated in Table 1.

In terms of women and land ownership the colonial system emphasised male ownership, as British gender assumptions were transposed onto varying Zambian norms. Currently, NGOs try to work with the Indunas and not go against 'traditions' so often maintain the status quo. However, although they tread very carefully, NGOs attempt to encourage women to participate in decision-making and have helped highlight the plight of the female-headed households and the challenges they face. Women can register land in Sefula, and be allocated control rights by the Induna on behalf of the Litunga. A woman may or may not use a male representative when approaching the Induna, but preference for land allocation will be given to men first as they are perceived to be 'bread winners' and they argue that women can marry to get land rights. The Induna only allocates land

Table 1. Summary of water rights for uses and users in Sefula, Western Province

Use	Users	Proximate source	Basis of Claim	Rights	Mediating institutions
Field irrigation	Subsistence farmers (male and female)	Canal, Wells, Stream	Customary rights, Political advocacy, Recognised by government	Withdrawal	Induna, Government institutions (Water Board, Department for Water affairs, Ministry of agriculture), NGO (Can only advise), Water Committee
	Commercial farmers	Private borehole, Stream, River	Land ownership, Riparian water law	Withdrawal, Exclusion, Management, Alienation	Water Board, Ministry of Agriculture
Homestead irrigation	Male and female	Borehole, Canal	Customary rights	Withdrawal, Exclusion	Induna, Water Committee
Livestock	Livestock	Borehole, Stream, River	Customary rights, Recognised by government	Withdrawal, Exclusion	Induna, Water Board
	Pastoralists	Dambo, Stream, Rivers	Customary rights	Withdrawal, Access	Induna
Pisciculture	Male Farmers	Canal	Recognised by government	Withdrawal, Access	Induna, Water Committee
Domestic	Settled community - women	Piped water, Wells, Boreholes, Canals	customary rights, recognised by government	Exclusion, Management	Chief/ Induna, Water Committee, Water Supplier
	Migrants	Irrigation canals, Dambo	Recognised by government	Exclusion, Management	Settled community, Induna
Business enterprises	Industrial	Dam, Piped water, Private boreholes	Private ownership of land, Riparian law	Withdrawal, Exclusion, Management	Water Board
	Artisans e.g. hairdressers	Piped water, Private borehole	Recognised by government	Tolerated use, Withdrawal	Water Committee, Water supplier
	Micro enterprise e.g. brick making	Private borehole	Recognised by government	Tolerated use, Withdrawal	Water Committee, Water supplier
Environment	Wildlife	river, canal, dambo	Recognised by government	Tolerated use, Access	Wildlife Authority
	Recreation e.g. swimming	Rivers, Canals,	Customary rights	Tolerated use, Access	
	Tourism	Dams, Rivers, Canals, Piped water	Recognised by government	Tolerated use, Access	Tourism Board and Ministry of Tourism

Use	Users	Proximate source	Basis of Claim	Rights	Mediating institutions
Other	Spiritual/cultural celebrations (migration of Litunga, baptism)	Springs, Dams, Rivers, streams	Customary rights, Recognised by government	Tolerated use, Access, Withdrawal	Induna
	Landless or dis-possessed people	Springs, Rivers, dambos	Fundamental basic need	None	Themselves

(Adapted from Meinzen-Dick and Bakker, 2001)

under his jurisdiction if it is not occupied. He has a right to withdraw land for a valid reason like non-cultivation or if the owner is not abiding by the rules and regulations of the chiefdom. It is common for natural water bodies to be used as boundary demarcations for land plots to maximise the number of water users for a particular water body. There is a local court where any conflict matters are resolved. If the Induna is not able to handle the matter it is referred to the main court held by the Litunga. In Sefula, once land is allocated by the Induna, it can be sub-let by the occupier, especially if the occupier is not making productive use of the land. The sub-letting is a private arrangement that the Induna may not always be aware of.

Use of water can be consumptive and non-consumptive. A non-consumptive use in which all the Lozi people participate is the Kuomboka ceremony. This is a traditional ceremony during which the Litunga migrates from the flood plain palace to the higher ground palace. Other than that there are some rituals that are used when someone dies or spirits have to be consulted. Some of these ceremonies are done near the water and are also non-consumptive.

Rights Transfer

In terms of the transfer of control rights, formal Zambian water law operates a permit system via the Water Development Board, so partial ownership (for example under a 99 year lease) may be transferred through sale and purchase of land. In terms of state land, transfer of control and use rights are structurally apportioned, whereby management, and exclusion rights may be sub let by individual permit holders or transferred as hereditary rights (for example under the 99 year lease system). Under traditionally governed water rights, there is a more flexible, and pro-poor range of transfer modalities because of the socially embedded character of the transactions, which mediate against unwieldy bureaucratic obligations. However, internally governed water regimes can exist in a position of false autonomy due to their interdependence with the entire watershed.

In Sefula, Lozi women and men both can hold land and water rights though this particular governance system is patriarchal. Migrants may be granted control rights depending on land availability and the mediation of the Induna. For single women, additional labour for cultivation often impels (re)marriage, but single women can and do own and cultivate their own land if they wish. Upon widowhood, a male relative tends to 'mediate' to ensure that land is kept in the family. It is possible for a widow to transfer rights to her children but this requires the approval of the Induna because he is responsible to maintain the customary 14-year tenure period. Other men in the village may compete for the land tenure if it is more fertile or closer to a water source than their land. Traditionally in Sefula, women are expected to get married when they reach a certain age and be supported by their husbands, although they carry out most of the work. This is not a generic trend as some Zambian tribes are matrilineal and ownership rights are inherited through the mother. Similarly, female chiefs command ownership rights in other areas. For matrilineal tribes, the women are more significant and may have been the landowners before the colonial days. It is apparent that in customary governance systems, micro politics principally determine the equity of access to water rights.

Equity

The human rights dimension of plural legal water rights is an issue of equity. The Oxford English Dictionary (1994) defines equity as "fairness and impartiality". In terms of actual water laws and policies, 'equity' is often defined ambiguously to maintain political acceptance. Water allocation disputes and decision

processes tend to focus upon 'needs' rather than 'rights' because the principle of equitable use is imprecisely defined (Giordano and Wolf, 2001). Issues of equity apply spatially, in terms of both physical and political boundaries, and temporally in terms of the historical and future dimensions and implications of water development, including seasonality. Equity is often conceived as an economic issue in terms of efficiency, and a political issue in terms of control. However, a multidimensional concept of 'equity' remains an appropriate lens to view a multifunctional resource like water. Tisdell (2003) analyses the dimensions of equity in prevailing water doctrines, concluding that non-priority permit systems (state controlled water allocation) allow for the greatest degree of equity, whereas Shiva (2002) concludes that close knit decentralised systems are more equitable. Syme *et. al.*, (1999) correlate equity in water allocation with procedural and distributive justice, noting that equity can be successfully negotiated at both universal and situational levels within specific catchments. Clearly, a multi-scalar approach is necessary if equity is to be a considered factor in water rights allocations.

In Sefula, an irrigation scheme was recently set up, with the help of a donor agency, to introduce irrigation to one of the farming communities in the area. The community was traditionally a farming community accustomed to rain fed cultivation. Historically the community grew rice in the latter part of the rainy season after some water had subsided from the flood plains. The irrigation scheme infrastructure was used to control and manage water levels in the flood plains to enable the communities produce two crops each year as opposed to one crop using rain fed farming. A perennial stream was converted into the main canal of the irrigation scheme and lateral secondary canals were also built. In terms of spatial equity, this development has a relatively low impact on 'external' water rights allocations because irrigation water replenishes groundwater, though the diversion of the stream reduces the potential viability of future downstream irrigators.

Sefula is legislated via a separate treaty signed by the Barotse Royal Establishment with the British Protectorate and which further complicates the pluralism of the water rights framework. International negotiations, for example over the Zambezi, are enacted by the government under Statutory Law which compounds both the degree of separation from, and the legitimacy of rights for, individual customary water rights holders. This is an issue of administrative equity. Historically, Western Province was treated as a labour pool for the mines, with corresponding agrarian underdevelopment. Temporal aspects of equitable water rights allocations are contentious because of state dynamics in addition to legal pluralism. Customarily governed rural areas become politically marginal at macro level, where uniform -equality based- water development laws and policies obscure historical discrimination, for example market based strategies, or subsidy to historically advantaged citizens. The vast array of institutions who have a political stake in water in Sefula means that allocation of water rights are mediated between families, Indunas, local government, donor agency staff, the water committee, and sometimes NGOs. The presence of donor agencies and NGOs simultaneously empowers and diminishes the capacity of various existing water institutions, while government can both strengthen and marginalize customary rules and norms.

For example, donor agencies and NGOs choose their locations with the help of the local authority who is usually the council and NGOs also work with line ministries such as Education and Health. They additionally base their choice of location on the willingness of the community to participate in projects and have a list of criteria like: number of people that will benefit from predetermined types of intervention, the possibility of assistance from other sources such as government, type of assistance required etc. Such institutional outreach is perceived to be capacity building, the discourse is of strengthening communities, whom often feel they are being empowered with skills and management tools. However, conflicting institutional priorities weaken local government as the communities become more dependent on the external institutions and more faithless in their local government agencies. Centrifugal water management dynamics compound the fragmentation of rights and responsibilities (Trottier, 1999).

In Sefula, the irrigation scheme members are encouraged to grow a variety of crops like wheat, winter maize and vegetables. The scheme has about 300 members and operates under a local water users group. The user group has regulations that the members should follow. The regulations are drawn up by the members of the scheme and are enforced by a committee that is elected by the scheme members. The scheme members currently use a first come first served (prior allocation) principle for plot irrigation. The uptake for the scheme is currently around 50 percent or less under cultivation. Later there are plans to have block irrigation with rotation for the different blocks. So each block will be able to irrigate a couple of days a week. The water user group committee draws up the rules. However, community participation has not necessarily

translated into a wholesale enabling environment. Some local farmers see the period of customary tenure as only 3 years, when in fact the rule tends to be 14 years. According to their perception, if they did not cultivate their land but instead rented it out for 3 consecutive years then they may lose their right of occupancy. The tenant on the plot of land was then believed to get the right of occupancy. The 3-year limit results in some plots of land in the scheme lying dormant during the dry season when irrigated cultivation is now viable.

Fieldwork has also shown that in cultivation at the household level or small scale, women usually have the task of weeding and planting. The watering is left to the men most of the time even if women are obliged to collect the water. When a water committee is set up there is a rule to say 50 percent should be women though some men explain that women are not forthcoming to take up positions. In one community the women said when they thought of water infrastructure like wells or boreholes, they felt men should be in the committee as they were good at fixing things. In this example, women are reluctant to participate in structures that they feel might give them extra labour burdens. A quota approach may have no immediate benefit to women, in terms of actual access to water, or increased political power. Generally, women are usually given the post of treasurer and standard committee membership, though the chairperson of the committee in Mongu irrigation scheme is a woman. Gender norms have significant impact upon the equity of water rights allocations.

Gender

"Gender is a constitutive element of social relationships based upon perceived differences between the sexes, and a primary way of signifying relationships of power." (Jacobson, 1999, p175). Gender is the third pillar of the Dublin Principles. In terms of official legislation, Zambia is a signatory to a number of international instruments but water and land reforms have not sufficiently engaged with gender[i]. Debates on land reform obfuscate the positive values of customarily governed resources, which precludes strategic policies to ensure women and men have a more equal footing in customary systems, despite the majority of Zambia being governed under customary riparian systems (Machina, 2002).

The gendered productive (which includes domestic) rights to water can be neglected by bureaucratic institutions, largely because 'the poor' water users, and indeed 'women' are viewed as homogeneous groupings (Van Koppen, 1998; Joshi, 2002). Joshi (2002) analyses some generic characteristics central to the failure of 'gender sensitive' water projects, including at an organisational (as opposed to solely at a 'grassroots') level. The failure stemming from the treatment of women as a unitary category leads to further exclusion of marginal people, and a lack of self reflection into gender normalisation erodes the basis for strategic gender empowerment, for example within institutions.

Gender sensitive water management interventions tend to reflect institutional gender practise, which directly impacts upon how effectively gender equality is promoted 'on the ground' (Longwe, 1997; Joshi, 2002; Guerquin, et. al., 2003). Guijt and Shah (1998), and Cornwall (2003) critique the fashionable notions of participation where it is treated institutionally as though technical management solutions are able to constructively deal with micro and/or macro political issues. External institutions are sometimes faced with the dilemma of whether to address pragmatic or strategic gender needs, but at least theoretically, this should be possible to negotiate with the women who are after all experts in their own lives (Østergaard, 1992; Guijt and Shah, 1997). Longwe (1997) analyses how extant gender policies can 'evaporate'. There are several dimensions to this process, notably to focus on increasing women's access to resources, not access to decision making structures, and also the tendency for gender to be isolated as a specific issue rather than a cross cutting concern. Conversely, addressing strategic gender needs, for example, increasing women's participation in water committees can erode practical gender needs such as the informal strategies necessary to gain access to water (Zwartveen and Meinzen-Dick, 2001). This can be even more problematic where women are encouraged to form 50 percent of the water committee, but have no other position of power in community politics.

Gender is not a synonym for women, but because women are structurally disadvantaged in the majority of the world's cultures, it is prudent to address this structural disadvantage as a priority issue. Due to gendered responsibility for social reproduction, gender is fundamental to the issue of water as a human right. The relation between gendered water and human rights is rhizomatic, extending to the construction of water scarcity

as an overpopulation, or 'cultural' issue (Hildyard, 1999). There is some potential for gender to become an integral unit of analysis within pluralist water legislation at local scales following Green's (1998) approach:

- What are the workloads and tasks for women, girls, boys, men? How and why are they shifting? In what way would new proposals help whom? How could any existing work overload of women and girls be reduced, and how would that extra time be spent?
- What labour obligations (women to men, men to women and intra-generational) currently exist, and how are these evolving? Are women 'compensated' for extra work, and if so how? What actions can avoid increasing women's total workload and/or deterioration of household food and nutritional security?
- How are household budgets divided in terms of income sources and expenditure obligations? To what extent has increased market involvement shifted obligations regarding food, childcare, and other household provisioning? What extended family budgetary processes exist? How can women's incomes be augmented, and provisioning obligations be made less onerous?
- What has been the historic pattern of access to land (individual and/or household basis)? How were women's rights to land to meet provisioning obligations ensured? What steps, beyond recognition of female-headed households and granting equal access can tangibly redress the increasingly inequitable position of women?
- Are water and fuel supply purely women's/girl's obligations? Are construction and maintenance/operation tasks male and/or female? What are the implications for voluntary male input into reducing women's subsequent workload (in terms of chores as well as for water-source/tree management structures, and improved water, wood, tree access)?
- Why do women farmers remain largely invisible to agricultural extension services (even when they do, in fact, address them)? How does this impede the functional efficiency of extension services and, especially, of female headed households? Are new crops/techniques assessed in terms of gender impact? Do small stock, crops, and trees particularly relevant to women receive adequate attention? Why not (e.g. because nobody knows which they are)? How can nutrition (and especially child feeding) linked to agriculture and health services be an entry point for participatory female-led initiatives (including income generation)?

(Adapted from Green, 1998, in Guijt and Shah, 1998, p76-77)

If the various components of water rights 'bundles' are explicit, then it becomes more clear as to how pragmatic and strategic gender needs could be met, for example in targeting irrigation governance systems to account for, implement appropriate policies, and monitor gendered divisions in the use, allocations, and control of water. This is dependent upon institutional norms and perceptions of gender and relies to a great extent upon a reflexive and self-critical institutional culture, as uncritical and uniform gender strategies are viewed as ineffective (Zwartveen and Meinzen-Dick, 2001; Joshi, 2002). Gender politics crucially determine the social scarcity of water.

In Sefula the local community have their own perceptions of water rights, which are closely linked to their land title or occupancy. The community obtains no formal water rights for their irrigation purposes. Even though the volumes used in irrigation are substantial. The water rights should be obtained through the Ministry of Agriculture and Cooperatives which is the authority on the setting up of irrigation schemes. The internal relations within the government and among the different institutions mean there is no enforcement of the water rights for irrigation schemes. The schemes seem exempt from official registration of water uses as required by the Water Board. The Sefula case study highlights some of the challenges faced in the plural legislation of water in Zambia. The water rights system remains in the common law realm and is apparently not translated into customary law and local perceptions of water management. The translation here refers to the adaptation of the water rights system in customary settings. The next section draws from another case study, which highlights some results of the local perceptions and the apparent non-translations of water rights.

Second order water scarcity

The concept of second order water scarcity distinguishes between an actual physical lack of water (which is a first order scarcity), and social-political construction of water scarcity (second order water scarcity). Therefore, second order water scarcity ranges at a scalar level from macroeconomic and institutional underdevelopment, to micro-politics. The centrifugal dynamics of institutional control of water in Zambia can be viewed as a confounding variable to the government's ability to ensure a human right to water. The

human right to water though alluded in the Water Act is not outwardly advocated for in the government publications and national discourse. The rural water sector in Zambia is heavily dependant on donor aid while the urban water sector is in the process of commercialisation. The commercialisation of urban water is simultaneously being implemented in various African countries. The idea of commercialisation and community participation in the management of resources is part of the economically viable development strategy for Africa. The structure of the New Economic Partnership for Africa's Development (NEPAD) is dependant upon the sovereignty and unity of African states (de Waal, 2002). Transformational approaches such as the African Peer Review Mechanism for donor aid may promote partnership and participation, but how this could translate into any pluralist framework for water management does not seem clear, given that NEPAD is firmly embedded within neo-liberalism.

For example, systems of market based tradable water rights have been increasingly advocated by institutions such as the World Bank as a mechanism to avoid conflict over first order water scarcity, but these mechanisms often create a second order water scarcity which erode the human and water rights of poorer people (Perret, 2002). In Zambia, fieldwork has demonstrated that in the majority of cases, the relative abundance of water precludes any development of tradable water rights via market mechanisms. However, even given Zambia's abundance of water, there is rampant second order scarcity.

A micro scale example of second order scarcity can be found in Chulu Ngoma, a village on the outskirts of Mbala with a population of about 500 households. There is a stream running along the edge of the village boundary. The village shares the stream with a privately owned farm. The villagers came to the current location in the 1960s, the farm was already privately owned. When the village was being set up the river used to flood and form a lake which the local people used as an open access water source, which appears to have led to a tragedy of the commons as no governance structures developed in order to regulate access. As the village grew the trees were cut down and the demand on the stream increased. Eventually around the mid 1980s the stream stopped flooding. People in Chulu Ngoma now use the stream and open access hand dug wells close to the stream as water sources.

When two boreholes were drilled in the village, the villagers were involved in the selection of the site where the boreholes would be located. Unfortunately, only one of the boreholes was in operation at the time of the field visit. According to the village headman only about 10 households were using the borehole whereas the chairman of the village development committee had over 50 households on his register for the borehole users. The operational borehole was drilled and a hand pump installed, which subsequently broke down. The residents blamed the breakdown on improper use of the pump and overuse. The District Water And Sanitation Health Committee (DWASHE) team repaired the borehole and installed a bucket and wind lass. Now the villagers complain about the size of the bucket which they feel is very limiting, and indeed collecting water even solely for domestic use is very cumbersome. Fortunately the wells dug near the stream have not yet dried up during the dry season.

When DWASHE rehabilitated the borehole, a water committee was formed to maintain the borehole. The committee was no longer functional but the treasurer who happened to be the wife of the chairman of the village development committee still collected water fees from the borehole users. The water committee chairman was allegedly very inactive as was the village headman. This lack of proper leadership resulted in a few other problems in the village. For instance to ease the suffering of the village when it came to water, water projects had been applied for, as opposed to developing more effective, or even functional governance systems. The community have actually now opted to get a furrow in their village to enable them carry out small scale farming in the dry season. Financial contributions had been collected from the villagers to go towards obtaining water rights. The water rights were for the stream that passes through the private farm. Villagers have been accused of trespassing when they tried to obtain water from the farm. The water right had not been granted yet but the community were very hopeful. The construction of the furrow would involve getting water from the stream on the private land and diverting it into the village. This is legally possible according to the documents held by the water board. The villagers who feel that development in their area was being hindered by the lack of clean and safe water have already marked out a route for the furrow. They are considering strategies to get a local school and medical centre in the village. At the time of the field visit, the villagers used the services in Mbala central which was a good hour's walk one way.

In this case study, the villagers are simultaneously laying stake to their legal human and water rights, through endogenous political advocacy. The equity considerations are manifold, ranging from the potential transfer

of existing ownership from the farmer to the community, the livelihood of the farmer as balanced against the health of hundreds of people, the zealous rent collection by the treasurer of the water committee in relation to the governance of the borehole, the historical exclusion of Zambians from free-hold tenure and political participation, and future management of the water resource (inter- and well as intra-generational sustainability). Strategic gender issues relate to the governance systems which regulate water rights and community politics more generally, whereas pragmatic gender issues include the considerable labour burdens of coping with the bucket and wind lass. Second order scarcity is evident in the lack of effective leadership and governance over the water which in this case has already developed into a first order scarcity of water. Centrifugal water management strategies at macro level, compound the locally induced water scarcity in Chulu Ngoma, and many other areas in Zambia.

Extensive research by Syme, *et. al*., (1999) analyses how first order scarcity increases community participation, cooperation, and equity if clear steps are taken to negate the second order scarcity. Empirical evidence from Zambia supports the notion of first order scarcity leading to eventual cooperation and at least micro-scale diminution of the second order scarcity. One example is of irrigation arrangements where upstream users get water in the afternoon and those down stream make use of the water in the morning. This particular situation occurred because there was insufficient water in the dry season. Neighbouring farmers had to negotiate among themselves on a friendly understanding. Initially the farmers would horde the water but now they know each one's livelihood depends on farming so they have to co-operate and make the best use of the water for their benefit as a group.

Conclusion

There is a theoretical argument that water rights are not human rights where people live on the margins of citizen hood (Manzo, 2003). There is empirical evidence that could support this argument, but also evidence demonstrating that communities actively stake claim to aspects of their legal human rights from the state by means of water permits. For a successful human right to water approach in Zambia, there would have to be considerable political advocacy, informing people of their legal rights and entitlements. People would then be more empowered to create strategies whereby they may achieve these rights. It is an approach that would take time in Zambia for a variety of reasons, because the legal customary rights of people are not well documented, especially the fact that water is associated with land tenure in customary systems. The advantage of the rights based approach to water is that it theoretically rules out exclusion from needed services according to the ability to pay and gender norms. This is crucial in ensuring the delivery of quality services to poorer people. One of the disadvantages is that a formal rights based approach precludes informal strategies, and therefore could further disadvantage people, particularly women, in the short term.

Water rights in Zambian are linked to the right of occupancy or title to the land where the water body is located. This applies to surface water and ground water even though the latter is not well documented. Ground water is to be included in the revised water act. At the moment formal water rights are granted to all applicants as Zambia has abundant water resources. Localised conflict for different water users may exist but can resolved at the local level or through the Water Board.

There is a danger that the national water policy framework, legal framework and institutional framework will focus on the urban water sector and provision of water rights to the more affluent Zambian communities. So-called grassroots institutions and norms are excluded from policy formulation. At the grassroots level most Zambians see water in terms of survival and a basic human right which is not the view at national level, or legislatively speaking. At national level the drive is to maximise the economic potential of water resources. In effect, the legal pluralism debate is part of the wider debate on governance and government. Human rights are currently impossible to legislate within systems of governance regardless of scale (i.e. from the World Bank to a small fishing or agricultural community). Despite the fact that actual human rights *may be* more effectively realised and promoted within certain governance systems, this is no guarantee that such rights *actually are*, or that they will *continue to be* in an ever more globalising – or fragmenting - world. Human rights can be legally upheld by democratic governments, assuming that democracy is defined as a process, or means to an end, rather than an object, or end in itself. Democratic government arbitration of a variety of governance regimes is proven to further promote legal and actual human rights to water (Wolf, 1998; Syne, *et. al.*, 1999). There may be potential for NEPAD to partially facilitate a coalescence of fragmented water management in Zambia in the future. The dynamics of macro level governance regimes,

for example structural adjustment, and corollary actors such as 'apolitical' international NGOs that are able to override democratic government tend to erode legal and actual human rights and hinder the evolution of pluralist frameworks.

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Notes

1. The General Comment on the right to water was adopted by the UN Covenant on Economic Social and Cultural Rights in 2002, so the 145 countries which ratified the Covenant agree that "the human right to water entitles everyone to sufficient, affordable, physically accessible, safe and acceptable water for personal and domestic uses" and are required to develop mechanisms to ensure that this goal is realised (Rijsberman, 2004). However, productive uses of water are not always meaningfully separated from domestic use, specifically in terms of subsistence agriculture (Moriarty, et. al., 2004) Water as a human right is implicit within the 1948 Declaration of Human Rights (non-binding), 1966 International Covenant on Economic, Social and Cultural Rights, 1966 Covenant on Civil and Political Rights, the 1986 Declaration on the Right to Development Under Article 10 of the UN Convention on the Law on Non-Navigational Uses of International Watercourses, basic human need should always be given priority in the event of any conflict (Gleick, 1998).
2. For example, Zambia is signatory to the United Nations Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), the SADC Gender and Development Declaration (1997) and the Beijing Declaration (1995) (Machina, 2002).

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Access to and monopoly over wetlands in Malawi

Daimon Kambewa

This paper focuses on the existing customary tenure and use rights to valuable wetland gardens and governance mechanisms. It identifies the modes of access, drawing attention to the differing roles of chiefs, families as well as households in wetland management. The study, carried out in the Lake Chilwa wetland in Malawi's Southern Region, demonstrates that access to water and land resources is closely intertwined and embedded in social ties and power relations. It contrasts the customary systems of governance and tenure with those that are likely to be put in place by the new land, water and irrigation policies and laws. A combination of qualitative methods and survey research was used to examine how the policies and development strategies are interacting with customary practices and are influencing livelihood strategies.

Keywords: wetland gardens, access, rights, obligation, social and power relations, tribute, monopoly, land concentration, Lake Chilwa, Malawi

Introduction

Wetlands, locally known as dambos in Malawi, are defined as any permanently or seasonally wet land in valleys, depressions, or floodplains with open herbaceous vegetation, mainly grasses and sedges, and an absence of trees (FAO 1996). In 1991/92 FAO Land Resources Evaluation Project (LREP) estimated that, in Malawi, the total irrigable area of dambos (wetlands) is between 480,000 ha and 600,000 ha (FAO 1996). Upland dambos formed about 70 percent of the area, while flood plains constituted about 25 percent. Districts with larger upland wetlands include Mzimba, Kasungu, Mchinji, and Dedza. Floodplains include Vwaza and Majete in the Lower Shire, Chikwawa District; Chilwa in the Phalombe plains covering Phalombe, Zomba, and Machinga Districts; and Kazuni in Rumphi; Nkhata Bay, and Karonga.

Wetland agriculture in Malawi takes place as formal and informal irrigation. Formal irrigation encompasses government schemes that were established from the 1960s to 1970s and self-help schemes that were constructed in the 1980s. In the Lake Chilwa wetland, such schemes include Domasi, Likangala, Bimbi, Chibwana, Mikoko, and Zumulu. Informal irrigation, locally called dimba cultivation, is carried out on customary lands especially in the dry season. Dimbas are irrigated gardens in wetlands, along the banks of streams and rivers, and in areas below small earth dams. Here dimbas are called wetland gardens in order to differentiate them from those found along the riverbanks. Currently, most irrigation in Malawi takes place in dimbas and estimates show that 123,000 ha are under informal irrigation compared to 27,000 ha under formal irrigation (GoM 2000a).

Both formal and informal irrigation are being promoted as a rural development strategy to improve rural income and food availability. Government efforts directed towards informal irrigation have increased since the 1990s when the country experienced a critical food shortage due to drought (Mzembe 1997). The efforts are manifested in a shift in policy from government-owned (formal) schemes to farmer-managed schemes and informal irrigation (GoM 2001). It is projected that wetland cultivation can transform rural livelihoods if people receive the requisite information, such as extension service, and technology, such as treadle pumps, plus input support, such as the Targeted Input Programme (TIP).

The driving forces behind intensification of wetland cultivation are recurrent droughts and floods, and declining soil fertility (FAO 1996). These, combined with limited access to land and farm inputs, have resulted in widespread poverty as manifested in most households experiencing food shortage. In 1998 nearly 60 percent of households had inadequate food, especially between December and February (NEC/NSO 1997/98). The situation became worse in the year 2002 when food shortage and famine showed how vulnerable the country is to natural calamities, such as drought, when associated with economic mismanagement by the government. The estimated number of deaths due to famine in 2002 ranged from 1,000 to 3,000 (Devereux 2002). Assani

(2003) suggested that the hunger crisis resulted in instances of crop theft, a situation that sometimes led to the accused thieves being killed.

In response to droughts, since the 1990s the Malawi Government, with assistance from FAO and the Danish International Development Agency (DANIDA), started mobilizing and supporting farmers to utilize wetlands, streams, and rivers for wetland cultivation (IFAD 1995). Of late, emphasis on wetland cultivation has been accompanied by political messages by the president and his cabinet, other political leaders, and government officials. Donors, particularly Department for International Development, instituted a dry-season TIP, directed specifically at dimba and supplied seed (especially maize seed) and free fertilizer. Programmes providing treadle pumps on loan have also been initiated to boost irrigated crop production.

Research questions and methodology

The study on which this paper is based was conducted in order to address the lack of information about existing modes of access and control over wetland gardens. The study also aimed at correcting information such as the misunderstanding of the tenure status of wetlands in the land policy, and the relative neglect of informal irrigation in the irrigation policy. If wetland cultivation is to be promoted, there is a need to clarify rights of access and to pay attention to ecological concerns. This study provides information on patterns of access to and allocation of wetlands and wetland gardens, and an analysis of the existing tenure system and use rights in the Chilwa Basin, located in the Southern Region of Malawi. A combination of qualitative methods, including participant observation, individual interviews, and survey research, was used to examine how policies, development strategies, and climatic and economic conditions have turned wetlands into valuable ecosystems for various livelihood strategies.

The research design adopted in the study was a case study in order to answer the question how access and use of wetlands is shaped. Prior to the study a reconnaissance survey was conducted in eleven sites namely, Manyamula, Namasalima, Njara, Likapa, Bimbi and Khanda in Zomba District; and Zumulu, Mposa, Chibwana, Kandauko and Mpheta in Machinga District, to assess the feasibility of the study. Four sites were then chosen for the study and these are Khanda and Likapa in Zomba and Mpheta and Mposa in Machinga. All the sites showed two different patterns of access but the four were chosen because there were logistically accessible. Likapa and Mpheta represented sites where GHV or VH allocate gardens while Khanda and Mposa represented sites where the gardens are inherited among families or households. In the chosen sites some areas of the wetland were demarcated as the study locus. The demarcated areas were about one kilometer long and half a kilometer wide and they covered about 20 percent of the area cultivated per site. A total of 1297 garden owners were enumerated and the list formed a sampling frame. Hence, instead of sampling in the villages, respondents were identified through gardens and they were followed later in the villages.

Results

Significance of wetland gardens

Cultivation in the Lake Chilwa wetland takes place throughout the year, with rice as the main crop in the rainy season. Rice varieties grown in the area include hybrids, such as faya, pusa, kilombero, and taichuni, and local varieties, such as amanda, kawasala, and tuwengane. Ecological variability across areas results in different cropping patterns. Thus, some people in Mpheta plant rice in the dry season because there is adequate moisture. In the dry season, from April to October, people grow maize, sweet potatoes, tomatoes, beans, pumpkins, cowpeas, green leafy vegetables, onions, and watermelons. Plots are usually intercropped. The cultivation calendar is such that the first crop is planted at the beginning of the rainy season, from October to November, and harvested in January or February. From March to April people prepare the gardens for the dry-season crop to be planted from April to October. Usually crops planted during this time grow on residual moisture, and it is only when there is critical moisture stress that people dig wells and use watering cans, pails, and plates to irrigate crops.

During the reconnaissance survey a total of 1297 garden owner were listed in the wetland and this only represented about 20 percent of the people in the study sites. During informal interviews the people said that

wetland cultivation is their main source of livelihood, followed by fishing. Usually they sell rice to get cash to meet household needs, while maize grown in the dry season is kept for food. In fact, 83 percent of the 170 respondents to the questionnaire said they keep the maize from wetland gardens for food. In Mposa it was observed that most houses had iron sheet roofs while some had television aerials, all of which people attributed to rice growing. In Mpheta village, one villager sold rice in the year 2003 and used the money to buy iron sheets for his house. Apart from cash generation, rice is also exchanged for maize, which is a staple food in all the sites. In Mposa area it was found that people come from TA Chamba (13 km. away) or nearby Chikala Hills to exchange maize for rice.

Households who have access to wetland gardens in the dry season reported that they normally have enough food throughout the year. In fact 75 percent said that they do not run out of food from January to February, a period when most Malawians do so because dryland maize is still immature. People with wetland gardens plant maize in September and October and harvest it in January and February. Households also supplement their cash by selling crops such as sweet potatoes, tomatoes, watermelons, sugarcane, and vegetables. Of course, these crops are also used for home consumption. Respondents reported that vendors usually buy their rice, vegetables, and sweet potatoes. In fact, in October 2003, vendors could be seen transporting bags of sweet potatoes on bicycles from the wetland to nearby markets like Zomba, Malosa, Govala, and Machinga. One day a truck was seen loading watermelons at Khanda, ready for sale at Zomba market.

Apart from wetland gardens, the survey revealed that people rely on other wetland resources such as fish (48 percent), grass for construction (19 percent), firewood (10 percent), reeds for construction (9 percent), and bird hunting (4 percent). Also included are activities such as brick making, residence, livestock grazing, and initiation and rain making ceremonies. Some reports indicated that cultivation in the wetland has resulted in loss of wildlife due to destruction of habitats. Some resources reported by respondents to be disappearing are: wild animals (28 percent), fish (12 percent) and birds (11 percent). There is also a change in crop pattern in the gardens where originally sweet potatoes, green leafy vegetables, and tomatoes were the common crops but, due to drought and TIP, many people now grow maize followed by sweet potatoes and vegetables in the gardens.

It is important to stress that in the research area wetland gardens for dry-season cultivation are not found throughout the basin but are concentrated in areas around the river mouths of Chanyungu and Lingoni in Mposa site, Domasi in Mpheta site, and Naisi in Khanda site. In Likapa site people rely on water coming out of Likangala Irrigation Scheme. In Mposa site it was observed that there were no gardens in the dry season in places that were one kilometer away from Chanyungu stream because the water dries up early. As a result, some people were cultivating stony places at the foot of Chikala Hill to grow maize. This was because they could not get gardens in the river mouth since it was all allocated, or they could not afford to rent, or they did not have relatives from whom to borrow the gardens. Some people have also moved to the upland slopes of Chikala Hill in search of land to grow maize.

Currently, the Chilwa Basin is faced with an increasing demand for wetland gardens, resulting in conflicts of interests and aims among various wetland users, conflicts over access and ownership of wetlands, and conflicts and competition for water among various users. In addition, there are environmental issues, particularly concerns that intensive wetland cultivation will lead to degradation of the wetland and related natural resources. Already experience in Mpheta study site is that floods from Domasi River occur every year and damage houses, property, and wetland gardens in Namasalima village, which lies at the edge of the wetland. Local people and government officers say floods are common because of deforestation of the upland areas. These floods have resulted in conflicts between residents of Mpheta and Namasalima villages. Those from Namasalima have attempted to construct a bund to protect their property but people from Mpheta have demolished it, arguing that the bund will destroy the canal carrying water to the Domasi Irrigation Scheme. This conflict has not yet been resolved.

Modes of access to wetland gardens

Gardens in the Lake Chilwa wetland are accessed through permission from village headmen (VH), group village headmen (GHV), and traditional authorities (TA), and through inheritance from family members. The VH, GVH and TA are all chiefs but VH and GVH are junior chiefs while TA is senior. Table 1 shows that out

of 170 households who had wetland gardens, 61 percent inherited from their family members, while 39 percent were allocated the gardens by the chiefs.

The first mode of access to be discussed is where gardens are inherited among family members. Table 1 shows that this practice exists in all the sites but it is most common in Mposa (88 percent) in Machinga District, and Khanda (81 percent) in Zomba District. During informal interviews people reported that households that inherit plots from family members do so without the involvement of the chiefs. In these cases, it is only in times of conflicts and disputes that chiefs would be asked to attend to issues of wetland cultivation.

Key informant interviews on the origins of inheritance of wetland gardens indicated that in the 1970s the TAs partitioned the wetland among village and family heads within their areas of jurisdiction, especially to those living close to the wetland. This was in response to increased demand by residents to cultivate the wetland. The demand might have been intensified as people got attracted by the benefits from the irrigation schemes, which were established in the area at around the same time. Reports from various people indicated that TA Mposa allocated the wetland to VHs in Mtambalika, Kambalame, Nanga, Mussa, and Mposa villages while GVH Khanda distributed the wetland to VHs in Khanda, Maliwata, and Kalemba villages. At that time, households within family groupings received plots and the VHs or family heads recognized the plots as belonging to the households. The question we are still following is why do people not just acquire plots in the adjacent irrigation schemes, instead of cultivating outside the schemes? So far people say land outside the schemes is more fertile than in the schemes.

Table 1. Modes of access to wetland gardens

Allocated by:	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
The Village Headman	4.6	11.9	55.8	19.0	22.9
The Group Village Headman	0.0	57.1	0.0	0.0	14.1
The Traditional Authority	7.0	0.0	0.0	0.0	1.8
Inherited from family members	88.4	31.0	44.2	81.0	61.2

The second mode of access is where chiefs allocate wetland gardens to individuals seeking land for cultivation. Table 1 shows that this practice is more common in Mpheta (69 percent) in Machinga District, and Likapa (56 percent) in Zomba District. Individuals getting the gardens from the chiefs only have user rights but there is no time limit as to how long they can use the garden, rather, there are conditions, which can result in an individual losing the garden, this will be explained in the next section. In the sample, the village headman is a predominant local management agent accounting for 23 percent of the gardens allocated, followed by group village headmen who allocated 14 percent.

An account of how some chiefs in the study area gained control of wetlands is found in Mpheta site in Machinga District. Here a chief increased his ability to control wetland access after he managed to remove people from Namasalima in Zomba District from his area. During the interviews it was revealed that people from Namasalima cultivated in the Mpheta area up to the 1980s, but GVH Mpheta removed them to give land to his people, arguing that the land belonged to people from Mpheta. However, after the people from Namasalima withdrew, those from Mpheta did not take up the plots because they feared that people from Namasalima would bewitch them. GVH Mpheta then announced that people from other places were free to cultivate in the area, but on the condition that they would become registered tax-payers of the village. Many did so, coming from the surrounding villages and other places to cultivate in a place called Bango within Mpheta site. People currently found in Bango come from areas within Zomba and Machinga Districts as well as other districts, such as Mulanje, Phalombe, Balaka, Ntchisi, and Nsanje. Some even came from

Mozambique. People migrated to the Mpheta area to fish or to grow rice in the irrigation schemes near Lake Chilwa. Others came because they did not have adequate land in their original homes or were in search of fertile soils. Some in-migrating men married women from Mpheta village. This has improved their access to gardens as the GVH has given them plots to cultivate because they are treated as citizens.

In another case - Likapa site - what was once a cattle-grazing area has been turned into an area for farming. Originally people did not cultivate gardens in the area because cattle destroyed their crops. However, due to diseases, most cattle died in the 1970s and '80s, and some cattle were stolen, after which some people started cultivating the wetland. Upon seeing the demand for cultivation, GVH Mbalu allocated the wetland to his subjects, VHs Ramusi 1, Ramusi 2, Ramusi 3 (Likapa), and Mbalu. It then followed that anyone who wanted gardens in the wetland went through the VHs.

Other modes of access to wetland gardens include renting and borrowing in the dry season. Results of the survey showed that of the 157 people who cultivated in the 2003 dry season, 90 percent (141) cultivated their own gardens while the rest relied on borrowing and renting. Again, thirty people (19 percent) out of 141 people who cultivated borrowed and, of these, 18 cultivated both their own gardens and also borrowed, whereas 12 relied only on borrowed gardens. Twenty people (13 percent) rented gardens and, of these, 16 cultivated their own and also rented, while 4 relied solely on renting.

Obligations and rights of use of wetland gardens

Requirements for ownership of wetland gardens

Access to wetland gardens is accompanied by some requirements here referred to as obligations. Individuals have to fulfill these obligations in order to secure ownership over the gardens. Table 2 shows that, overall, 61 percent of the households received the gardens with obligations, while 39 percent had no obligations to fulfill. The most common obligation is that households should pay tribute to chiefs (44 percent). Lesser obligations include the need to cultivate every season (18 percent), be a full member of the village (14 percent), participate in development activities, and also respect chiefs. Table 2 also shows that the obligation to pay tribute varies from place to place and is more prevalent in Likapa (81 percent) and Mpheta (69 percent) than in Khanda and Mposa sites where it was recorded 14 percent and 9 percent respectively.

Table 2. Requirements for ownership of wetland gardens

Requirements	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
No requirements	76.7	23.8	0.0	57.1	39.4
Pay tribute to local leaders	9.3	69.0	81.4	14.3	43.5
Cultivate plots every season	14.0	7.1	18.6	31.0	17.6
Be member of the village/area	2.3	9.5	27.9	14.3	13.5
Do development work	2.3	9.5	7.0	0.0	4.7
Respect local leaders	2.3	2.4	2.3	0.0	1.8

The tribute that people pay is in form of bags of rice and it is locally called *chothokoza* (literally meaning "thanks"). During informal interviews people indicated that they are required to give the chief bags of rice

from the rainy-season harvest in order to secure ownership or cultivate the gardens. Most people pay one 50 kg bag of rice per garden, while some pay one bag regardless of the number of gardens. In the dry season, people use the gardens to grow maize, rice, vegetables, and other crops, without giving the chief any extra payment. Failure to pay tribute often means that the chiefs can take away the gardens. To confirm this claim people revealed that four people in one village in Mpheta site lost gardens to the chief because they did not pay tribute. However, people were not completely free to discuss the subject in detail for fear that the chiefs would hear and take away their gardens.

During informal interviews, the people clarified that the tribute is an annual rent to the chiefs and it is organized such that there are committees, whose job is to register people, show them the gardens, and collect bags of rice after harvesting. One chief justified the practice as the only way he could get food and income since he cannot work in the field, as he is always busy performing his duties as chief, for example, settling disputes. In 2002/03, this chief reported that he received 40 bags of rice and sold them at K500 each. He used the money to buy iron sheets for his two houses. Another chief received 26 bags through tribute from people. The chiefs defended the tribute practice saying they collect bags of rice to sell and use the money to carry out development work that benefits the whole community, for example, construction bridges and paths. A fact most respondents disagreed, saying the chief always asks people to pay separate money for development or the people themselves construct bridges. The outcry from the people is that they are being exploited. In fact, people complained that they pay cash in order to be shown the land for gardens and to construct their huts. The amounts vary from MK100 to MK1000 and it is paid once in life.

Oral history has shown that the tribute is an old practice in the Lake Chilwa wetland. Key informants indicated that the practice is similar to an old one, locally known as *kuphikira mowa*. *Kuphikira mowa* was a practice where new families or households settling in a village prepared beer and other foods to thank the chief for giving them the land to settle and cultivate. Reports indicated that in the colonial period, a family or household would move out of its village seeking new land to settle and cultivate in another village. The chief in the new village gave land without demanding any pay. During harvesting period, the new family prepared beer and other foods and calls the chief and his subjects to feast. At the end of the feast, the family organized gifts for the chief, and these could be livestock or crops. The *kuphikira mowa* function marked a time a family or household was officially accepted as members of the village. In the subsequent years, every household gave produce to the chief as thanks for the land they cultivate. In some cases chiefs were thanked for rain-calling practice, where they were associated with powers to call rain. The *kuphikira mowa* practice does not take place any more, but gifts are still being given to the chiefs.

It is important to mention here that some people, such as fellow VHs, the elderly, or those related to the VH or GVH, are exempted from the tribute practice and it is subject to changes. One VH in Khanda site reported that he used to have the practice but he stopped because some people abused it and people in the area showed displeasure. But in Mposa it was reported that another VH was considering starting to require tribute because he did not receive adequate compensation for his work as chief, and he was also attracted by the considerable rental income earned by his peers. The practice is indeed prone to abuse as noted in Mpheta, where people reported that committee members collected rentals for the gardens in addition to bags of rice. They also collected more bags of rice than they passed on to the chief. For example, the chief indicated that in the year 2003 he got 26 bags while the committee said they collected 46 bags, and yet there are over 300 households in the area who are supposed to pay bags.

Failure to cultivate is yet another requirement by which people could lose access to their gardens. Although few people (18 percent, see Table 2) mentioned it, the obligation exists in all the sites under both modes of access. During the reconnaissance survey, it was reported that failure to cultivate every year results in some people losing the gardens. A case in point exists in Likapa site where an individual lost a garden to the chief because it was not cultivated. The individual came from Mozambique to Likapa site in the early 1990s, looking for piecework, and he became employed as a watchman/herdsman. He then obtained a garden from the chief but it away in 2003 because he did not cultivate in the 2002/03 season since he was sick. With the increasing prevalence of HIV/AIDS, it is likely that more people will lose their gardens due to an inability to cultivate yearly.

Ownership and freedom of use of wetland gardens

Access to wetland gardens is accompanied by degrees of freedom on what one can or cannot do. The freedoms – the obverse of obligations – are referred to here as rights of use of gardens. These rights include the right to dispose the garden to an heir, lend, and the right to rent. Table 3 shows that, overall, 83 percent (141) of the households are free to dispose of their gardens to an heir, 69 percent are free to lend, and 40 percent are free to rent out the gardens. At the same time no one is free to sell the gardens in any of the sites. The rights vary with sites, for example, more people are free to dispose to an heir in Mposa (95 percent) and Khanda site (98 percent). The right to lent out is higher in Likapa (81 percent) and Khanda (86 percent) while renting is higher in Mposa (67 percent) and Khanda (79 per cent). As a reminder, Mposa and Khanda are the sites where gardens are inherited among family members while Mpheta and Likapa is where chiefs allocate the gardens.

Table 3. Freedom of use of wetland gardens

Freedom	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
Freedom to dispose to an heir	95.4	73.8	65.1	97.6	83.0
Freedom to lend	58.1	52.4	81.4	85.7	69.4
Freedom to rent out	67.4	4.8	9.3	78.6	40.0
Freedom to sell	0.0	0.0	0.0	0.0	0.0

So far the results show that more people are allowed to rent and pass to an heir in the sites where the gardens are inherited among family members, while there are some restrictions in sites where chiefs allocate the gardens. However, lending does not follow the same pattern as it happens that regardless of sites, some people are restricted while others are allowed to lend out the gardens. This observation is confirmed in Table 4 where the right to pass on a garden to an heir varies with modes of access. Table 4 shows that overall, 57 percent of the households who received the gardens from family members are free to do so, compared to 27 percent of those who were allocated the gardens by chiefs.

Table 4. Modes of access vs freedom to pass on wetland garden to heir

Mode of access	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
Through local leaders	2.3	26.2	20.9	0.0	12.4
Through family members	2.3	0.0	14.0	2.4	4.6
Total not free pass a garden	4.6	26.2	34.9	2.4	17.0
Through local leaders	9.3	42.8	34.9	19.0	26.5
Through families members	86.1	31.0	30.2	78.6	56.5
Total free to pass a garden	95.4	73.8	65.1	97.6	83.0

As indicated in Table 3, a total of 83 percent (141) of the people have the right to pass on their gardens to heirs. Table 5 shows that 67 percent (95) of the people with a right of disposal to heirs do not pay annual tribute (*chothokoza*) to the chief, thus constituting those with greatest security over the gardens. On the other hand, 33 percent (46) have the right to dispose of the gardens to heirs but also pay tribute, and this is more common in Mpheta (58 percent) and Likapa (79 percent). Informal interviews indicated the right of disposal to an heir was conditional on the willingness of an individual to pay tribute annually.

Table 5. Tribute practice vs freedom to pass on wetland garden to heir

Mode of access	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	41	31	28	41	141
Local leader without tribute	7.3	6.5	7.1	9.8	7.8
Family without tribute to leader	87.8	35.5	14.3	80.5	59.6
Total without tribute	95.1	42.0	21.4	90.2	67.4
Local leader with tribute	4.9	51.5	39.3	9.8	23.4
Family with tribute to leader	0.0	6.5	39.3	0.0	9.2
Total with tribute	4.9	58.0	78.6	9.8	32.6

The obligation to pay tribute is the largest constraint on tenure of the gardens. Table 6 shows that the same number of people (33 percent) who could not pass the gardens to an heir considered the gardens to belong to the chief because the latter can take away the gardens if one fails to pay tribute. This is against 67 percent who considered the gardens as personal property because they were inherited from parents. The degree of ownership varies among the sites; for example in Mposa and Khanda, 84 percent and 83 percent, respectively, consider the gardens as personal property. In Mpheta and Likapa, 45 percent and 77 percent, respectively, indicated that they do not own the gardens. This implies that in places where families allocate gardens there is security of ownership unlike where chiefs control allocation.

Table 6. Ownership over wetland gardens

Mode of access	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
Not mine unless I pay tribute to the chief	2.3	45.2	76.7	7.1	32.9
Mine since I inherited from parents	83.7	47.6	23.3	83.3	59.4
Mine because the chief is a witness	14.0	7.1	0.0	9.5	7.6

Generally, people who said that the gardens are not theirs, consider themselves as temporary citizens. The sense of temporary ownership was also evidenced in the type of houses the people had. Despite having stayed quite long periods in their current locations, people lived in simple huts while they had good houses (for

example, with iron roofs) in their original homes. Noted though is that people who come looking for gardens are located away from the main villages: for example, in Mpheta the people live in Bango area, which is about half a kilometre away from Mpheta village. A related observation was made in GVH Mbalu area during the reconnaissance survey. In this area, the in-migrants are located in a place called Manyamula and it is about a kilometre from Mbalu village, going towards the Lake Chilwa.

The second right of use is lending wetland gardens. Table 7 shows that a total of 69 percent of the people are free to lend their gardens. The right to lend wetland gardens varies with the modes of access. Overall, more people (44 percent) are free to lend out when the gardens are allocated by families, compared with 25 percent when chiefs control allocation of gardens. People with many gardens mainly do lending, and sometimes when the owner is sick. The borrower pays nothing and it is claimed that it is one way of enabling each other to grow crops in the dry season. However, a close look at the practice showed that one result of people lending gardens is to keep them cleared. One person from Maliwata village in Khanda site commented that instead of hiring labour to till, he just lends the gardens during the dry season and gets them back when time for planting rice comes in the rains. In this case he does not need labour for clearing and tilling the gardens.

Borrowing is mostly done among relatives and close friends. Cases in point are in Mposa where Biti Major stayed with her husband in Mbalame village and borrowed a garden from her brother cheMajor in Chipojola village. In Khanda, Mrs. Sululu from Mwandama village borrowed a garden from Mrs. Chikaonda from Khanda village, because her sister was married to Mrs. Chikaonda's son. A key condition for a borrower is that he or she is only allowed to cultivate the garden during the dry season, after which the plot is given back so that the owner can use it in the rainy season. Another condition is that the owner can lend the garden for up to three years; more than three years is said to result in the borrower taking over the garden because it is assumed that the owner is no longer interested in it.

Table 7. Modes of access vs freedom to lend wetland gardens

Mode of access	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
Through local leaders	4.7	35.9	14.0	0.0	13.5
Through family members	37.2	11.7	4.6	14.3	17.1
Total not free to lend	41.9	47.6	18.6	14.3	30.6
Through local leaders	7.0	33.3	41.9	19.0	25.3
Through family members	51.1	19.1	39.5	66.7	44.1
Total free to lend	58.1	52.4	81.4	85.7	69.4

However, during informal interviews some people indicated that they were not willing to lend out their gardens because they did not trust borrowers. Some analysis revealed that 29 percent of the 52 respondents who did not lend out their gardens did so because they feared borrowers would not return the gardens after use, while 62 percent did not lend because the land belonged to the chiefs and the latter prohibited lending. It can therefore be argued that, while chiefs restrict borrowing, chances for one to borrow are also rooted in the trust between the owner of the garden and the borrower.

The third right of use is the right to rent out the gardens. Table 8 shows that more people are free to rent out gardens in Khanda (79 percent) and Mposa (67 percent), but renting is restricted in Mpheta (95 percent) and Likapa (91 percent). Thus, renting is allowed where families allocate gardens and it is prohibited in sites where chiefs control allocation of gardens.

During key informant interviews chiefs indicated that if a member is found renting out a garden they take the garden away because renting is similar to selling and nobody is allowed to sell land. Renting also implies that an individual has more land than needed. However, some individuals indicated that in practice renting takes place. At the time of the survey, rental charges varied from K300 to K700 depending on the size of the garden. Renters usually come from places such as Zomba City and Liwonde, although some are from within the sites. The renters mostly used hired labour (*ganyu*) to work in the gardens and sometimes the owners of the gardens also participated in *ganyu*.

Table 8. Modes of access vs freedom to rent out wetland gardens

Mode of access	Study site				
	Mposa (%)	Mpheta (%)	Likapa (%)	Khanda (%)	Total (%)
n	43	42	43	42	170
Through local leaders	4.7	66.7	51.2	4.8	31.8
Through family members	27.9	28.5	39.5	16.6	28.2
Total not free to rent out	32.6	95.2	90.7	21.4	60.0
Through local leaders	7.0	2.4	4.7	14.3	7.1
Through families members	60.4	2.4	4.6	64.3	32.9
Total free to rent out	67.4	4.8	9.3	78.6	40.0

Discussion

The study has shown that people with access to wetland gardens have an advantage in terms of food availability. Seventy-five percent of the respondents with gardens said that they have enough maize for family consumption. Wetland gardens also supplement cash income in the households. Those who are unable to gain access to a wetland garden thus are at a considerable disadvantage. Those who can either borrow or rent a garden are somewhat better off. However, rental fees may be high and thus limit access. The study has also shown that wetland garden is an activity being carried out by thousands of small farmers.

However, the value of wetland gardens is threatened by the fact that people who do not have gardens cultivate in the hills. These are the people who cannot afford to rent, or they do not have relatives from whom to borrow, or the gardens are all fully allocated such that the wetland has reached a saturation point. A report by FAO (1996) warned against cultivation practices in the uplands, especially when this is done without soil conservation techniques. The argument is that upland cultivation facilitates soil erosion and siltation in rivers, and it encourages peak flows in streams that then facilitate gully formation in wetlands. The overall result is a reduced flow of water into the streams and lowered water tables in the wetland. The effects on the farmers are that the area under cultivation is reduced and the period when the wetland can be cropped on residual moisture is reduced as well, a situation that ends in increased conflicts over access to, and use of, areas with moisture.

However, on a positive note, soil erosion brings fertile soils down into the wetland as farmers themselves pointed out; they said that they do not apply chemical fertilizer because "fertility comes from the uplands."

The environmental concerns are valid but it should be recognized that in Malawi, just as in most other countries in the SADC region, there are no wetland policies formulated specifically to guide the wise-use concept in wetlands. Countries usually put elements of wise-use under environmental policies and legislation. This is with exception of Zambia, which by 2001 had a draft policy. Uganda is another country in Africa with a national wetland policy aimed at halting destruction of these areas (RoU, 1995). In accordance with the policy the Ugandan Government has trained and placed extension staff at district level so that they can supervise wetland management and utilization. Wetland management in Malawi falls under the mandate of the National Parks and Wildlife policy with its focus on biodiversity, as well under other environmental policies. The danger with the use of multiple policies is that they are usually develop independent of each other and they are not harmonized, such that they can result into confusion and conflict during implementation of the wise-use concept.

The study has revealed that access to water and land is intertwined and there are no separate rights and obligations for land and water in the wetland. This is because people mostly use residual moisture, and if a well is dug, one puts it in his or her own garden. So far there are no cases of people selling or begging for water. The study has shown that access is embedded in social ties and power relations, for example, many people (61 percent, see Table 1) accessed through inheritance among family members. Another example is where borrowing of the gardens is mostly done among family members and closest friends. This suggests that one may be assured of having a garden as long as he/she is a member of the family that owns the wetland. Family members do not only constitute blood relations, as some can use marriage links to borrow the gardens. While some members lend gardens just to help others grow crops in the dry season, it has been noted that lending is done to keep the gardens clean for rainy season planting. By implication access is rooted in reciprocity, where people feel they should be helped because they also help other (Mtika, 2001). However, sometimes individuals do not want to lend others because they fear that borrowers may not return the gardens, implying that access is also tied to the trust that exists between people. While social ties are conduits of access, the second mode, which is allocation by chiefs, implies that power relations shape access and ownership of wetland gardens. In this study 33 percent (see Table 6) of the people had security over the gardens only when they served the interests of the chiefs by paying bags of rice. In other words, being a member of the family does not warrant access or ownership, rather, it depends on one's willingness to serve the interests of the chiefs in power.

The study has further shown that there is monopoly over the wetland by the households and the chiefs. What accounts for the difference seems to be the interpretation given by different chiefs and families to their rights and obligations. As far as the household claims are concerned the wetland and wetland gardens may be seen as their *de facto* private property. This agrees with the findings by Mkandawire on arable land, that when land has been allocated, households have total control and no one can oust them without due consultation (Mkandawire, 1992). In fact, possession of land transcends an individual lifetime, for land is held to belong to the living, the dead, and the unborn. The findings support the analysis in the new land policy, which accepts that "customary" tenure more often means family property, and which proposes the means for legal recognition of such private ownership. As far as the chief-controlled system is concerned, those chiefs who demand annual payments argue that access to the wetland is conditional on the willingness of an individual to pay tribute. This fact is disputed by some other chiefs as well as by some villagers.

Of course allocation of gardens by chiefs conforms to the ideal situation on arable land (Mkandawire, 1992 and GoM, 2001), namely that access to land may be gained through the village heads who get their right of administration from the chiefs who are the custodians of all the land. Village heads may allocate land to individuals, their children, or any member of the extended family. However, those chiefs who control access, do so out of their vested interests, thus, demanding payment in the form of bags of rice for the plots they allocate. The practice of giving some produce to the chief who allocated the gardens has been described in the past and present in some parts of the country, but it has been more closely associated with dry-land fields than wetlands (GoM, 2001). Moreover, the system is now an annual obligatory payment for wetland gardens, some

chiefs are like landlords instead of trustees of land, and the traditional gift giving has evolved into monetized and extractive practice akin to paying rent. As one chief claimed, he gets tribute as compensation for the services he renders. These services include settling land and family disputes and organizing TIP programmes. According to the claim by the chief, it can be understood that the closest members in the village use decency to claim these services while the in-migrants have to pay. The behaviour by the chiefs is often referred to as 'rent-seeking' by political scientist and economists among others. However, the concept of rent-seeking does not address what is really happening on the ground as it has been seen that the practice operates within social, economic and political contest. For example, fellow chiefs and close relatives are exempted; other chiefs denounce the practice and some people pay more while others pay less. The specific social relations cannot be explained by a simple market monopoly concept.

So far it remains important to know that the monopolistic behaviour of the chiefs comes from the traditional powers vested in them but reinforced by the land policy as custodians of land. The chiefs are using these powers to concentrate land for themselves by suppressing those with whom they have weak relationships. If chiefs were to succeed in land concentration, one may expect more conflicts, especially with those who may not want to comply with the conditions attached. Already, some chiefs say they are attracted to the practice as a way of increasing their income. Rising demand for the wetlands, especially in view of recurrent droughts and dwindling uplands for cultivation, may well increase the tendency of these chiefs to claim more wetlands, thereby increase insecurity over the gardens among the villagers, especially, the in-migrants. The existing conflicts over this issue have generated arguments over who is the rightful chief. Some claim that a certain lineage is not supposed to provide chiefs because they came into the area later, while another lineage claims that the other group cannot provide chiefs because their ancestors came to the area as slaves. An analysis suggests that the cases are not about chieftaincy or original settlers alone, but about who should have authority over valuable land. The results are social conflict, social divisions, and splits within villages.

The tribute practice is similar to *kuphikira mowa* practice. This suggests that the practice is old and it might have existed along side the tenancy labour system described by Mkandawire in 1992. Mkandawire (1992) stated that in the Southern Region of Malawi, large land alienation together with immigration of the Lomwe people from Mozambique in the early 1900s, along with population growth, resulting in scarcity of land within the African Trust area. Scarcity of land caused major conflicts over land between European estate owners and smallholder encroachers. A 'solution' to the conflict was the development of a tenancy labour system whereby peasants had to supply labour to estates in exchange for a small plot of land. This tenancy system was called *thangata*, which in Chichewa means to assist. However, the first president of the Republic of Malawi, Kamuzu Banda, abolished *thangata* soon after independence in 1964. It is therefore interesting to see some of its elements still existing in the wetlands now. Why these elements have persisted shows how research has not paid much attention to social issues in wetlands, hence, it is another area that requires more work to be done.

Implications of the research findings on land, water and irrigation policies

The results of the study form customary systems of governance and tenure to wetlands for irrigation and are contrasted with those that are proposed by new land, water and irrigation policies. To begin with, current perception in the land policy about wetlands is that they are unallocated land and access is open, and chiefs are the trustees (GoM, 2001). This perception does not hold in the Lake Chilwa wetland where land is household property or chiefs hold it as personal property and not as trustees. Therefore the assumption does not reflect what is really happening on the ground and it obscures policy challenges such as the composition of the proposed land management committees to oversee land allocation. The question to be answered during the implementation of the policy relates to whether chiefs should become members of the committees or what role they should play, knowing that they are not neutral entities, rather, they have vested interests, which might affect the work of the committees. It seems chiefs should not be given an upper role in the land management committees as this would advantage them to concentrate the wetland to themselves.

The results have implications for the water policy, which proposes to give water permits to any users using water for productive purposes. However, the study found that there are thousands of small farmers with small wetland gardens, which are personal, borrowed or rented. It is not clear how the small farmers will be

organized to get water permits. A meeting with policy makers in August 2004 showed that the observation was an eye opener which requires serious considerations, hence, there are no clear ideas yet on how to handle the issue. The issue becomes complicated when we consider that wetland gardens rely on water from the streams. This suggests that an increase in demand for wetland gardens has potential for conflict over water with stream-bank gardens and with irrigation schemes upstream. Here, it implies that promoting irrigation in wetlands requires an integrated and coordinated approach between upstream and downstream users and among the different authorities including those in irrigation, agriculture, water and environment. Usually, the policies are disjointed and their implementation is conflicting, for example, irrigation policy encourages cultivation in wetlands including areas along river and stream-banks. On the other hand the policies on environment and land resources aim at protecting rivers by leaving some area as buffer zone. The idea of buffer zone is defeated further by technologies that are used to carry water to irrigate crops by concentrating cultivation in the buffer zone since farmers only carry water a short distance.

The land policy further proposes that any group of families or individuals living in a locality or having customary land rights in a defined area that seeks to protect their common property interest over the wetland should be recognized. The same thinking applies in the water policy, which also proposes the formation of catchment management committees to ensure sustainable utilization of water resource. The irrigation policy (GoM, 2000b) also adopts the thinking and proposes the establishment of farmer associations and farmer clubs as a pre-condition for supporting irrigation schemes and *dimba* farming respectively. The thinking is to organized people so that they can manage water resources as groups with common interest. However, the study has revealed that wetland users are socially differentiated by place of origin, relationship to the chief and age, sex, some are renters and borrowers while others are controllers. These groups have different rights and obligation, for example, some pay tribute while other are exempted. In fact, instead of common interest, different categories of people draw on elements of trusteeship, as the case of chiefs, and entitlements based on family and locality in order to claim access and ownership over the wetlands.

Two issues for policy implications emerge from the proposals to organize people by common interest. First, the idea risks concentrating water and land resources in the hands of those in power such as the chiefs. Second, the idea may create more structures, which may claim authority and ownership thereby intensifying competitions and conflicts over wetlands with the existing ones, thus, families and chiefs. As mentioned earlier, implementation of these ideas requires careful consideration to avoid creating advantages for some sections of societies. The concern here is how much sensitive the policies are to the informal institutions that govern access to land and water resources.

Conclusions

The study concludes that wetland cultivation is very important for people's livelihoods. While this news is not new, it is important to notice that this value is threatened by other activities in the ecosystem; its sustainability, therefore, is dependent on the collaboration among various users, as well as collaboration among wetland-related policies in land, agriculture, environment, wildlife, and water sectors.

Another conclusion is there is concentration of the wetland going on among family members and some chiefs. Wetland concentration is a result of the monopolistic behaviour by some chiefs and households. The behaviour by the chiefs should be noted and outreach programmes are required in order to reduce it. Already the land policy warns that "holding land in trust for citizens does not make the Headperson, Chief, or any public official the owner of the land". Of course in terms of broadening access, it seems that where chiefs monopolize the wetland, people from outside the districts and even outside Malawi have obtained gardens. This is contrary to the pattern of *de facto* family property, where families monopolize and allocate gardens, almost always to kin. But the practice of demanding annual payments is a clear deviation from their traditional role as custodians and administrators. It is also counter to the proposal in the new land policy that *dambos* should be exclusive to members within the Traditional Authority's area or be converted to smaller areas under common property.

A third conclusion is that access and ownership of the wetland is secure for some people and insecure for others. This means implementation of the land policy in wetlands should not be based on a broad perception

that there is increased land customary tenure insecurity, as the reform process did. This perception only holds true for the areas where some chiefs allocate the gardens, and it does not apply in places where the gardens have become personal property for the households. If wetland utilization goals for agriculture are to be achieved access by various people should be enhanced. At a national level, the achievement of the goals is dependent on putting in place a policy and laws. These policies and laws have to be sensitive to the social and power relations existing in the wetland, otherwise there is a chance that the policies will only work to the advantage of the chiefs to accumulate land for themselves at the expense of other villagers. At the local level, enhancement of access is dependent on establishing governance practices that are transparent and accountable to the people in allocation of the gardens and dispute resolution. This would require formation of groups of local users to manage conflict resolution and land allocation systems, instead of leaving such systems in the hands of chiefs only.

In sum, this study reveals a localized debate over the value, modes of access, and legitimate rights over wetlands and wetland gardens, which, so far, has remained invisible to policy makers, planners, and development practitioners. It is to be hoped that the detailed analysis of the social and power relations in wetlands provided here will further more appropriate consideration of these valuable resources in policy and administrative procedures.

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The interface between customary and statutory water rights – a statutory perspective

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In the countries where customary rules play a significant role, particularly in the rural areas, customary law and customary water rights are a factor to be reckoned with when preparing "modern" legislation regulating the abstraction and use of water resources through government permits or licences. From a statutory perspective, the two water rights systems intersect and interact in the transitional phase following enactment of new water legislation, and in the course of administering the latter's abstraction licensing regulatory provisions. The law avails mechanisms to prevent collision between the two water rights systems, and to settle disputes. The analysis of these mechanisms raises a number of issues. Further research into the functioning of these mechanisms will be welcome to shed additional light on a much neglected facet of water resources law, and to enrich the policy debate on the role and accommodation of customary water rights in the new dispensation inaugurated by modern water legislation.

Keywords: water law, water legislation, water rights, customary law, customary water rights, dispute prevention, dispute settlement

Introduction

The last two decades of the 20th century and the beginning of the current century have witnessed a spate of new laws on freshwater management and development[1]. This phenomenon reflects increasing attention to the looming "water crisis" by policymakers, legislators and public opinion in a vast number of countries from all parts of the world alike. This surge of statutory law, i.e., the body of law laid down in the Acts of legislature and in subordinate legislation, however, offers no *per se* guarantee of change on the ground. On one hand, the success of regulatory legislation in general, and of legislation regulating access to and use of natural resources, like notably, freshwater, in particular, hinges on *implementation* and *enforcement*. Both implementation and enforcement have met with problems in many a jurisdiction, for a variety of reasons, the investigation of which is beyond the scope of this paper. On the other hand, whereas regulation of water resources abstraction and use stands a chance of success in regard to the relatively few large commercial users of the "raw" resource (i.e., water drawn directly by the user from rivers and wells), the reach of such law in rural areas in general can be effectively stifled by a combination of factors, such as a myriad of users of the raw resource, low literacy rates, and difficulty of communication from the capital city. To these factors one must add the resilience of a body of water law pre-existing statutory water law, commonly known and referred to as "customary law", i.e., law and rules based on long-standing practice, not codified in written form.

In countries where customary law and customary water rights play a significant role, particularly in rural areas where they govern access and rights to water for basic human needs, for the watering of livestock and for subsistence agriculture, customary law and customary water rights are a factor to be reckoned with when preparing "modern" legislation regulating the abstraction and use of water resources through government permits or licences. Failure to recognize the existence and resilience of customary practices, and to take them into account in "modern" water resources legislation, is a recipe for social tension[2].

This paper will contribute to mapping out the area of interface of customary water rights and statutory water rights. Based on original surveys and analyses of water legislation and customary water rights and practices in Canada (Nowlan 2004), Ghana (Sarpong 2004), Guyana (Janki 2004), and Nigeria (Kuruk 2004)[3], as well as a brief analysis of the contemporary legislation of Argentina, Indonesia, and Namibia, this paper will (a) review the extent to which customary water-related practices and rights have been accounted for in water legislation, (b) analyze the approaches to reconciling such rights with the rights created by statute and administered by government, and (c) based on the analysis, flag emerging issues as well as sketch an agenda for future action.

Some salient features of customary water rights

Customary law consists of the customs and practices accepted by members of indigenous groups as binding upon them[4]. While customary law and rights in general enjoy constitutional status in Canada and Ghana, in none of the countries surveyed can they be regarded as a uniform body of law and rules, as customs and practices vary from group to group[5].

A detailed description of the customary water rights in the four main countries surveyed is beyond the scope of this paper[6]. Customary *water* rights are frequently rooted in customary *land* law, i.e., the body of rules and practices which govern access to and tenure of land. This is so in Nigeria, where a customary grant of land generally confers rights on water resources, among other products of the soil[7]. In Canada, customary water rights have been implied by the courts in aboriginal title to land, in treaty-based land rights, in land reserve rights, and in common law land-based riparian rights[8]. Until enactment of the Water Resources Commission Act of 1996, customary water rights in Ghana were, by and large, regarded as part of land rights[9]. And, Indonesia's new Water Resources Law's provisions on the "traditional rights" of local communities are ostensibly directed at *land* rights and, only by implication, at the *water* rights which accrue from them[10]. As will be shown later in this paper, these salient features of customary water rights are not devoid of legal implications when it comes to their interface with statutory water rights, and with modern water legislation which severs the land-water link and de-couples water rights in general from the land.

Points of intersection and interaction of customary and statutory water law and water rights and legislative approaches to reconciling the two

Theoretically, customary water law and rights could co-exist with and alongside statutory water law and rights, as two separate systems and bodies of law, mutually impermeable. This proposition, however, is untenable in practice as the two systems are bound to intersect and interact, in space and time. They do so particularly where a country's legislature adopts legislation providing new rules of water resources appropriation, use and protection. As such legislation invariably upsets a pre-existing body of rules, be they of customary or also of statutory origin, and the rights operating under these rules. Enactment of such new legislation inaugurates a transitional period of intense interaction of the new and the old sets of legally binding rules, during which mutual adjustment of the old rules and rights to the new rules, but also of the latter to the former, is pursued and generally achieved, as smoothly and painlessly as permitted by the rules provided to this specific end by the new legislation[11].

Once this time-limited transitional process is over, opportunities for intersection and interaction will continue to arise. This interaction will take place to the extent that the pre-existing body of customary rules and practices controlling water resources appropriation and use particularly in the rural areas, and the rights operating under them, survive new legislation and the ensuing adjustment process[12]. Customary rights become then an important factor to be reckoned with and taken into account by government in the administration of legislation inaugurating water abstraction licensing and, in particular, in the process of disposing of applications for the grant of a licence, and thereafter during the life of a water abstraction licence.

Statutory recognition and safeguarding of "pre-existing" customary rights

When the Water and Sewerage Act of 2002 was adopted, Guyana's lawmakers recognized and safeguarded "any right, privilege, freedom or usage possessed or exercised by law or *by custom* by any person"[13] (emphasis added). The relevant statutory provision connotes the lawmakers' will to accommodate *en bloc* customary water rights alongside statutory water rights. However, to qualify as customary water uses, it must be proved that these uses are ancient, certain, reasonable and continuous. It is unclear to what extent customary uses of water would meet this standard and it is the burden of the communities concerned to prove the existence of customary use. To complicate matters, Guyana's Act provides no definition of the exact scope of this saving provision, nor is there any case law that would help[14]. A similar approach is reflected in Indonesia's new Law on Water Resources, adopted in March 2004, to replace the previous Law on Water Resources of 1974. The new Law carries an implicit statutory recognition of the "local traditional communal rights" held by traditional communities, so long as these are known to exist in fact and have been "confirmed" by local regional

regulations. Recognition, however, is conditional upon communal rights not contravening national interests and the legislation. The new Law also volunteers criteria to test traditional rights for being in existence[15].

Ghana has taken a different approach. In an attempt to attract customary law and rights within the fold of statutory law, Ghana's lawmakers vested ownership of water resources in the State, and directed the holders of water rights to stake their claim within twelve months of the coming into force of the Water Resources Commission Act of 1996. The government would then investigate such claims and, if it found that a right indeed existed, "it would take such action as it considers appropriate". However, no claims are known to have been filed, nor have any administrative actions been reported to have been taken, pursuant to this remarkably open-ended provision[16]. As a result, whether a successful claim would result in the transformation of an original customary water right into an administrative right, subject to all the restrictions and limitations of this latter category of water rights, is a matter for intellectual speculation.

This issue has been addressed head-on by the Argentinian Province of Tucuman's Water Act of 2001. This Act states that "traditional" rights pre-existing the Act would, on application to be made within one year of the coming into force of the Act, be confirmed through the grant of an administrative concession. The administrative concession is not subject to a term of duration, however the rights accruing from it become subject to the new statutory provisions and water rights regime[17]. This includes, in particular and by implication, the obligations imposed by the statute on all water rights holders, and the government's authority to cancel the right under given circumstances.

The approach taken by these countries, of seeking to bring within the fold of statutory law traditional customary rights, is common across all jurisdictions, in the developing and in the developed parts of the world alike. A vast majority of the countries where surface-water resources were historically appropriated and used on the basis of riparian rights and groundwater on the basis of the rule of "capture"[18] has, in the past two decades, transitioned from what could be described as a system of customary water law and rights to an entirely new dispensation based on government water abstraction permits and licences. In the process, pre-existing customary rights have invariably been brought within the fold of the new legislation through either of two techniques or both. The two common techniques are: (a) a statutory grant of original usufructuary-type rights (see below for relevant discussion), and (b) an administrative recognition-cum-safeguarding of existing rights[19].

This administrative recognition-cum-safeguarding is rarely *en bloc*, but more frequently subject to meeting given substantive and evidentiary requirements, and to a discretionary appreciation of the same by government[20]. Administrative recognition-cum-safeguarding, in particular, tends to be conceived of by lawmakers as an opportunity offered to the holders of pre-existing rights, be these based on custom or other legal grounds, to "come forward" and have their rights formally acknowledged and recorded by the government. This window of opportunity is transitional, generally lasting one year after the coming into force of the new legislation. Failure to avail such opportunity generally implies forfeiting the protection afforded statutorily to all rights covered by the new water resources legislation as against third-party claims, including claims by government. This sanction "bites" when this transitional window of opportunity closes and the next conceivable opportunity for intersection and interaction between statutory and customary rights materializes, i.e., in the normal course of administering the new statutory water abstraction licensing requirements (see below).

Proving that a customary right or practice exists is central to the recognition and the ensuing recording process. The legislation sometimes helps by supplying standards or criteria of required evidence to guide the discretion of government or the courts if the rights are litigated. In Nigeria, Customary courts hear cases involving customary law and rights. The judges of these courts are presumed to know the customary law and can apply it on the basis of their personal knowledge. However, the parties may call in witnesses acquainted with the native custom, including chiefs, linguists, advisers and other experts. Books and manuscripts, and reports of Customary courts on questions referred to them are also regarded as legitimate sources of evidence[21]. The courts too have developed standards of evidence. For example, in Canada, in a landmark case on aboriginal title to land, the Supreme Court accepted the use of oral evidence[22]. In another Canadian case, a ten-factor test was laid down to prove the existence of an aboriginal fishing right[23].

Statutory grant of original usufructuary rights to water for selected purposes

In Nigeria, by virtue of the Water Resources Decree of 1993, the legislators vested in the Federal Government a superior right to the use and control of all interstate water resources. At the same time, Nigeria's legislators also bestowed on "any person" an original statutory right:

- to take water without charge for the person's domestic purpose or for watering his/her livestock from any watercourse to which the public has "free access"[24], and
- to use water for fishing to the extent that such use is not inconsistent with any other law in force.

In addition, a customary right of occupancy of land would attract an original statutory right to draw water from under the ground or from an adjacent stream, without charge, for domestic purposes, for watering livestock and for personal irrigation[25].

This approach is also common across virtually all jurisdictions which have transitioned from traditional riparian and capture rights to water to an entirely new dispensation based on government water abstraction permits and licences. The ostensible purpose and justification of this approach is to achieve administrative expediency by "weeding out" a myriad of sparse users who are reckoned to place, individually, no serious stress on the available water resources, and thus lighten the burden on government of administering the abstraction licensing legislation. Arguably, a less apparent, but no less compelling, purpose for the kind of provisions illustrated above is to defuse the potential for social disruption inherent in a radical change in the "rules of the game" by, in particular, acknowledging to a given extent the rights and practices of customary origin.

Accounting for customary rights in the administration of statutory abstraction licensing requirements

Once the transitional phase of intense interaction between customary rights and new water legislation discussed earlier is over, opportunities for intersection and interaction of the two, and of the water abstraction and utilization rights accruing through the operation of both, are bound to arise in the regular course of administration of the licensing requirements of the new legislation. Ideally, the transitional phase of interaction and adjustment between the two systems and the rights under each will have brought within the fold of statutory law all pre-existing customary rights. The transitional phase should also have afforded all pre-existing customary rights equal standing and protection as are afforded statutory water rights against the claims of new applicants for the abstraction and utilization of the same water resources. At that level and stage, customary water rights will, in practice, be no different than statutory water rights as to legal standing and protection before the law. By virtue of having been recorded with and made known to the government water administration, those rights will be routinely protected by the government water administrators as they dispose of new applications for the grant of statutory abstraction licences which conflict with those rights[26].

This, however, is an ideal scenario. In practice, pockets of customary rights and practices, particularly in rural areas, are bound to escape the net cast by the capital city's lawmakers and water administrators. Such pockets of unaccounted-for rights vary in size and significance, and tend to be in direct proportion to (a) the number of customary users scattered in the countryside, (b) their ignorance of, or (c) indifference to, the new water legislation in general, and its transitional rules and the opportunities these afford in particular, and (d) the government water administrators' willingness and ability to inform and sensitize the user population and, eventually, to make good on the threats carried by the legislation against the users who ignore its transitional provisions and opportunities[27]. In addition, the protection from third-party claims which is implicit in the formal recognition of customary water rights is not water-tight as the government tends to enjoy wide latitude in appraising applications for the grant of statutory abstraction licences.

Reconciling customary and statutory water rights in the process of disposing of applications for the grant of new abstraction licences

As a general rule, new statutory licences can only be granted subject to pre-existing rights and licences. If pre-existing rights need be sacrificed, in whole or in part, to accommodate a new licence, compensation is generally provided. For the existing and the proposed new water rights to be reconciled, however, the former must be or become known to the government water administrators responsible for the disposal of applications and the eventual granting of new abstraction licenses. The transitional recognition-cum-safeguarding opportunities availed by the legislation are intended to provide government with just that information and knowledge. If, for one reason or another, these time-limited opportunities have not been availed, existing customary rights could,

in theory, be claimed as against a proposed new license through the public information and consultation process generally availed by the legislation in the course of disposing of new license applications, and prior to making a final administrative decision on them.

In Canada, *consultation* with aboriginal groups or individuals holding customary water rights, with a view to determining if a proposed water abstraction licence will affect such rights, is entrenched in much provincial water legislation[28]. In particular, the British Columbia department which administers the water licensing legislation has developed an elaborate procedure of consultation to determine if a proposed water abstraction licence will affect aboriginal interests, and has drawn up Protocols for water administrators to use to fulfil their consultation duties. Case law is also available on the matter, and it is in constant evolution. In particular, the courts have held that the nature and scope of the water administrators' duty to consult vary with the circumstances, and that it may stretch as far as requiring the prior consent of the affected group.

The legislation can go as far as prescribing to what extent customary water rights are to be factored by the government water administrators in the abstraction licensing decision-making process. This, regardless of whether such rights are on record as a result of their having been surveyed and formally recognized, or they come to light at the investigation stage of new license applications. Namibia's legislature adopted recently a Water Resources Management Bill, for instance, which directs the government water administrators to (a) take into account customary water rights in determining applications for abstraction licenses, and (b) enter in the new abstraction licenses terms and conditions which will satisfy the requirements of customary water rights[29].

Recourse is routinely available to water rights holders in general, and to the holders of customary water rights in particular, to challenge an administrative decision to grant a water abstraction licence. In Canada, most provincial water licensing systems provide for affected parties to appeal from such decisions, often in the first instance to an administrative tribunal and then to a court of law[30]. In particular, British Columbia's Environmental Appeal Board has heard several cases involving conflicts between customary water rights held by aboriginal groups or individuals and statutorily-granted water abstraction licences. Only a handful of cases, however, has reached the judiciary so far in that Province and elsewhere in Canada, with mixed results for the plaintiff customary water rights holders[31].

Reconciling customary and statutory water rights in the course of operating new abstraction licences

Conflict situations may arise also if a licence has been granted in ignorance of pre-existing customary rights, and these come to light after the licence has begun operating and generates, as a result, the resistance of the customary rights holders. The recourse mechanisms described in the previous section to challenge a water abstraction licence are also available to address this conflict situation, provided however that the relevant statute of limitations has not run its course, and recourse has not become time-barred as a result. Short of this, legal recourse can also be had on the grounds of a takings violation of constitutionally protected property rights. The remedy sought could consist of the total or partial withdrawal of a licence or, alternatively when this course of action is not feasible or desirable, compensation. A compelling case could be made particularly where customary water rights derive from customarily-held landed property rights. It has been argued that this could well be so under Guyana's constitutional provisions on the protection from deprivation of property[32]. A similar argument has been put forward, also hypothetically, as grounds for the protection of customary water rights under Ghana's constitutional guarantees of property rights[33].

Other avenues to reconciling customary and statutory water rights

In Canada, the Province of British Columbia (BC) has embarked on a Water Use Planning (WUP) process aimed at reviewing the operating conditions of BC Hydro's power generation facilities with the goal of finding a better balance between competing uses of water that are socially, environmentally and economically acceptable. WUP is not a statutory process, yet the Provincial government has gone to the extent of developing WUP Guidelines which imply that one of the Province's intentions in developing WUPs is to canvass the customary water rights of aboriginal groups[34] and, in the process, defuse opportunities for confrontation and eventual dispute.

The goal of defusing opportunities for confrontation and eventual dispute underpins also other mechanisms devised by the legislation to engage customary water rights holders in statutorily-mandated and -regulated decision-making by government. These range from membership of one tribal chief in Ghana's Water Resources Commission to the obligation placed by Guyana's Water and Sewerage Act of 2002[35] on the Minister responsible for water resources to consult with Amerindian Village Councils in developing the national water policy[36]. The consultation requirements of Canada's government water administrators with customary water rights holders when the government contemplates water resources allocation decisions has been mentioned earlier. *Co-management* regimes have been established, also in Canada, where indigenous peoples participate directly in planning and administration decisions over natural resources, including water. Since the first co-management regime and institution were negotiated in 1975, more than fifteen Boards have been formed to manage and allocate resources in a particular area of Crown lands and waters. The Boards which have been established in Yukon, the Northwest Territories and in Nunavut have, among others, water abstraction licensing authority and responsibilities[37].

Issues emerging

A paramount issue of much on-going "modernization" of water resources legislation is how to deal with pre-existing rights and practices of customary origin, at least in those countries where customary law constitutes a legitimate source of law, and customary rights play a significant role, particularly in the rural areas. Stated otherwise, dealing with such rights and, in the process, striking the "right" balance between the security of title legitimately sought by commercially-minded investors and the equally legitimate requirements of traditional livelihoods and lifestyles is a paramount issue which water lawmakers must grapple with. Standard statutory responses to this issue have been illustrated, which provide the policy parameters for the government water administrators to strike the balance best suited to the circumstances of each particular case.

The statutory responses, and their day-to-day implementation on the ground, trigger in train a number of other emerging issues, notably:

- customary water rights holders may be ignorant of, or simply indifferent to, the initial opportunities for formal recognition-cum-safeguarding of customary rights afforded by water resources legislation[38]. Lack of or inappropriate communication, lack of incentives, and a cultural bias, are the root causes of such ignorance and indifference. Both risk entrenching the insulation of customary systems of water rights from mainstream statutory-driven change, and multiplying as a result opportunities for confrontation and dispute at a mature stage of implementation of the legislation, in the course of administering its water abstraction licensing provisions;
- for the same reasons, customary water rights holders may be equally ignorant of, or simply indifferent to, the subsequent avenues for their rights to be accounted for at the stage of administering the water abstraction licensing provisions of the water legislation. This risks undermining the security of statutory abstraction licenses, as these will be exposed to legal challenges on a variety of possible grounds, so long at least as the affected customary rights holders have the required knowledge of their rights and of the avenues for protection through government and the judiciary afforded statutorily - and, of course, the means to approach both and to vindicate their rights;
- to be effective as a vehicle to defusing opportunities for confrontation and dispute between customary and statutory water rights and users, participation of customary water rights holders and groups in government-driven decision-making on matters of policy, planning and day-to-day water resources allocation, must be meaningful. Arguably, for instance, membership of a lone tribal chief in Ghana's fifteen-member Water Resources Commission hardly lives up to this standard, and pays lip service to the role and significance which customary water rights are reckoned to have in that country;
- in the process of accounting for customary water rights for the purposes of water resources legislation, the standards of evidence supplied by the latter to prove a customary water right will play a critical role. It is readily apparent that if the evidentiary requirements are set too high many customary rights will not survive, at least on the terms set statutorily;
- the holders of customary water rights will perceive themselves as losers if, as a result of successful formal recognition of their rights, these are replaced by statutory rights, and become as a result subject to all the

limitations as to quantity and purpose of water withdrawal, and duration of the right, and to burdens like payment of charges, which generally accompany and qualify statutory water abstraction licences[39];
- much "modernization" of water resources legislation is underpinned by a culture of decoupling water resources from the land, which is at loggerheads with customary water rights generally deriving from customary land tenure[40]. By cutting off customary water rights from their source, the risk is to further erode the cultural identity and diversity of the rights holders and their groups. In particular,, if decoupling is pushed to the extreme of allowing statutory water rights in general, and formally recognized customary water rights in particular, to drift away from the land and the original purpose for which water was abstracted and used thereon, to where the market dictates, there is a serious risk of further marginalizing the holders of customary water rights and their groups[41].

Conclusions

This limited review and analysis of experience and legislation discloses that customary water rights intersect and interact with statutory law at the stage of formal recognition of the former by the latter. This phase follows enactment of the legislation and is time-limited. It culminates in the formal "recognition" of customary rights and in their attraction into the statutory regime of regulated water abstraction licenses and rights inaugurated by the legislation.

Customary water rights surviving this transitional phase intersect and interact with statutory water rights typically accruing from water abstraction licenses, at subsequent phases:
- the reconnaissance phase of customary rights in the process of disposing of statutorily-regulated abstraction license applications, with a view to the former being reckoned with in this process. Intersection and interaction at this level occur also, and in particular, if customary water rights have gone un-accounted for in the recognition phase mentioned earlier;
- in default, the operating phase of statutory water abstraction licenses, i.e., when these have begun impacting on customary water rights which have gone un-accounted for in the formal recognition and in the reconnaissance stages of these rights, alluded to above. This interaction continues to occur where newly granted statutory rights may interfere with unrecognized customary rights, up until the point of the statute of limitations for making such interference claims, or longer should the judiciary have any discretion.

The two are potentially highly conflictive areas of legal intersection and interaction between the two water rights systems. Statutory law has responded by availing legal mechanisms to prevent confrontation and to settle formal disputes, and to ultimately seek to reconcile customary and statutory water rights. The statutory responses, however, raise a number of issues, some of which have been identified and briefly discussed.

In the countries where they play a significant role, accounting fairly for customary water rights in a new statutory environment favouring effectiveness and efficiency of water allocation and use is a key factor in the smooth operation of the new dispensation inaugurated by water resources legislation, and in its ultimate success. The achievement of this goal calls for collaborative-type mechanisms engaging customary water rights holders, and inviting them to approach the legislation and avail themselves of the opportunities this provides to be "counted in" in the new statutory dispensation. The success of the legislation on this score very much depends on the statutory incentives provided, and on the government's strategy to communicate and reach out to customary water rights holders. In default, expensive, time-consuming and unpredictable confrontational means of formal dispute settlement remain the only option for customary water rights holders to be reckoned with by the government water administrators and by the holders of statutory water abstraction licences.

Further research into the areas of intersection and interaction mapped out in this paper and, in particular, into the collaborative- and the confrontational-type response mechanisms provided by the formal legal systems, is called for to corroborate the analysis and the findings of this paper, to uncover additional experience on the ground and additional relevant legislation, and to identify and discuss additional issues. More in general, such research is desirable to shed additional light on a much neglected aspect of water law, and to enrich the policy

debate on the role and accommodation of customary water rights in the new dispensation inaugurated by modern water resources legislation.

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Notes

[1] Reviews of selections of these, by this author, have featured in 12 *Water Law*, 330-337 (2001), 14 *Water Law*, 7-15, and 281-290 (2003). FAO 2002 carries a review of trends and developments in contemporary water resources legislation (on p. 145-161).

[2] Customary water rights have been referred to as the "sleeping giant" of water law in Western and Northern Canada as many of the older land claim treaties with native people did not address water rights (Nowlan 2004, p.1)

[3] These four country studies were jointly commissioned by the Food and Agriculture Organization of the United Nations (FAO) and the International Union for Conservation of Nature (IUCN) under a research project investigating the interface of customary and statutory water rights, in progress.

[4] A thorough discussion of what is meant by customary law in the specific context of water resources and water rights features in FAO 2004, on p.84-88.

[5] In Nigeria, different rules may apply to members of the same language group (Kuruk 2004, p.4)

[6] FAO 1996 carries a systematic survey of the available literature on customary water rights in Africa.

[7] Kuruk 2004, p.6

[8] Nowlan 2004, p.18-19, 20, and 22, and court cases and literature cited therein.

[9] Sarpong 2004, p.8.

[10] See the relevant discussion and legislative references at 3.1 below.

[11] The relevant clauses are generally found at the end of any new statute, under the label of "transitional provisions" - i.e., provisions of limited duration, designed to ensure a smooth transition from the old to the new system of water resources dispensation over a set period of time. Once this is over, the "transitional provisions" become void.

[12] Survival may be due to a variety of factors, ranging from the deliberate will of the lawmakers to accommodate *en bloc* customary rules and practices at one end of the spectrum, to the deliberate resistance of water users to the new rules imposed by statute, and a no-enforcement policy of government, at the other end of the spectrum.

[13] Section 94.

[14] This discussion is based on Janki 2004, p.9

[15] Law No.7 of 2004, Article 6 and relevant Elucidation. Interestingly enough, the Elucidation clarifies that the "traditional rights" the Law refers to are *land* rights.

[16] Sarpong 2004, p.8.
[17] Law No.7139, as amended by Law No.7140, sections 28 and 33
[18] Ownership or possession of land abutting a stream, and ownership or possession of the land which overlies groundwater, have traditionally provided the legal bases for, respectively, riparian rights to surfacewater and for capture rights to grondwater, across legal systems.
[19] As in Guyana
[20] As in Ghana, Indonesia and the Argentinian Province of Tucuman.
[21] Kuruk 2004, p.11
[22] Nowlan 2004, p.8 and case cited there.
[23] *Idem*, p.16-17 and case cited there.
[24] This term is not defined in the Decree.
[25] Section 2. As defined in the Decree, "domestic use" means the use of water for drinking, washing, bathing, cooking, gardening, or for any other domestic purpose in any residential premises utilized for non-profit motives.
[26] If the government water administrators fail in their duties, or if they discharge their duties to the dissatisfaction of existing rights holders, avenues of recourse are routinely available to the latter under the water resources legislation.
[27] The experience of Mexico in the implementation and administration of the transitional provisions of the 1992 Law on National Water Resources is a textbook example of water user population ignorance of, and indifference to, the "opportunities" afforded existing water users by the new statute. User ignorance and indifference occurred on such a scale that the lawmakers had to go back to the drawing board and re-think the transitional phase and process anew, and re-draw the relevant legislation (see FAO 2001, p.21-53.).
[28] The discussion here draws extensively from Nowlan 2004, p. 28-
[29] Sections 35(1)(h), and 37(b). The Bill carries in section 1(1) a statutory definition of "customary rights and practices" and of "traditional community". The Bill was passed by the Namibian legislature in November 2004, and is awaiting promulgation by the President of the Republic.
[30] The discussion draws extensively from Nowlan 2004, p.27.
[31] These are illustrated at some length in Nowlan 2004, p.34-37.
[32] Janki 2004, p.13
[33] Sarpong 2004, p.9
[34] Reported in Nowlan 2004, p.24-25
[35] Sarpong 2004, p.7
[36] Janki 2004, p.16
[37] Nowlan 2004, p.31-33
[38] To date, no applications have been made under Guyana Water and Sewerage Act, 2002's six-month transitional provisions for the recognition of customary water rights. It is reckoned that this is almost certainly due to ignorance of the statute and its provisions by the traditional communities holding customary water rights (Janki 2004, p.14). In similar vein, it has been argued that, in Ghana, customary rights and practices regarding water utilization go on unabated on the ground, with traditional users and communities not having the remotest idea of the impact that the Water Resources Commission Act, 1996 has had on their ancestral water rights (Sarpong 2004, p.12).
[39] This issue has been posited in relation to Guyana, where once a water abstraction licence is granted under the Water and Sewerage Act, 2002 it replaces the "lawful authority" under which water used to be previously abstracted and used and therefore customary access rights would become extinguished. As a result, hitherto customary users would become subject to payment of an annual administration fee and an annual abstraction fee. However such condition would conflict with customary rights to use water without payment. Furthermore, "converted" customary right could be suspended or cancelled by government for breach of a condition of the licence. This, however, would have serious implications for the livelihood of customary communities (Janki 2004, p.15). See also in this regard the Argentinian Province of Tucuman's Water Act provisions illustrated at 3.1.
[40] A thorough discussion of the complex interface between land rights and water rights of both statutory and customary origin features in FAO 2004, on p.83-94, and 104-105. The same features also a discussion of the "decoupling" issue in relation to the tradability of water rights, on p.94-98.
[41] This phenomenon has been documented, notably, in Chile, where water rights can be freely traded as a commodity.

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The dynamic relationship between property rights, water resource management and poverty in the Lake Victoria Basin

Victor Orindi with Chris Huggins

This review aims to synthesize information on the dynamic relationships between property rights to land and natural resources, water resource management and poverty in the Lake Victoria Basin of East Africa. It focuses on the way in which water management systems, under the conceptual umbrella of Integrated Water Resources Management (IWRM), address customary claims to land and water. The water sector in all the three countries is being reformed, decentralized and liberalized to improve efficiency in water delivery. However, it is not clear whether this will result in improved water access for low-income areas, especially remote rural areas. There are concerns that some aspects of the water sector are being emphasized at the expense of others and this may distract attention from some of the socio-economic and political causes of poor water access. Similarly, all three countries are currently in the process of revising land policies and laws. The paper concludes that customary land and water rights remain significant forms of rights across the basin, even though they are not addressed through legal or policy frameworks.

Keywords: Lake Victoria, property rights, water resource management

Introduction

Lake Victoria has a total catchment area of 184 200 sq km shared among the east African countries of Kenya, Uganda and Tanzania and supports about 28 million of the poorest rural inhabitants in the world (Swallow et al, 2003). Poverty rates in the basin are 50% or more and especially high in the lakeshore areas of Kenya, where the situation is compounded by a high incidence of HIV/AIDS and water associated diseases along water ways (ibid). Major water uses in the Lake Victoria basin include domestic and livestock water supply, irrigation, hydropower generation, transport, fishing and wildlife water supply. Overall, agriculture is the most important water use, representing almost 90% of total use in Tanzania, more than three-quarters of total use in Kenya, and two-thirds of total use in Uganda (Dungumaro, E. and Madulu, N. 2002).

Table 1. Freshwater Withdrawal in East Africa

Country	Agricultural Water Use	Domestic Water Use	Industrial Water Use
Kenya	76%	20%	4%
Tanzania	89%	9%	8%
Uganda	60%	32%	2%

Source: Dungumaro, E. and Madulu, N. (2002)

Given the importance of land access for livelihoods, it is particularly important that governance of land issues is participatory and empowering. Land access is also an important prerequisite, in some cases, for enhanced access to water. Reducing poor people's vulnerability includes putting measures in place that safeguard their access to resources and this may include providing formal recognition to some current customary access regimes, which requires participatory forms of planning and governance at all levels. Devolved systems of governance should allow active participation of users in natural resources management debates. Legislation should enable the poor to access water resources and create incentives for sustainable use, through recognizing and incorporating people's needs and their traditional management systems.

This paper looks at the dynamic relationship between property rights, water resources management and poverty within Lake Victoria Basin (LVB) of East Africa. Poverty and inequality in the Lake Victoria Basin is exacerbated by the inability of some people, due to a variety of constraining processes, to access their full property rights and profitably transform these rights into goods and services. These constraining processes may not be fully recognized or articulated by governments; development agencies and local people themselves, and are not fully addressed by policies and laws at international, national and local levels.

Depending on ones' social, economic and political status in society, some are able to influence decisions governing resource allocation to their advantage at times impacting negatively on the rest of society. Checks and balances in the form of policies, laws and regulations are therefore necessary to guard against such activities. The LVB is undergoing rapid change due to increasing resource scarcity, changing land uses, liberalization of economies and effects of HIV/AIDS which is having a significant impact on livelihoods and the way resources are accessed. Appropriate multi-dimensional property rights systems (including formal/statutory, informal/customary and social systems) that may provide tenure security while accommodating interests of multiple uses and users are therefore needed. In East Africa, as elsewhere in the world, legislation and policy on water management does not take land tenure – particularly customary land tenure systems – into account, and vice-versa. It has been recognized by policy-makers that "the practice of water management cannot be separated from questions of land management since access to water in most cases derives from access to land. Control of access to water in dry land, for example, is often a tenure-building mechanism, affecting land settlement patterns, disenfranchising the less powerful from access to water, in the process creating conflict" (Nyaoro, J. 1999). However, actually designing institutions and policies that allow a true integration between land and water needs is difficult, for a variety of reasons.

Poverty-environment linkages

Poor people rely more heavily and directly on local natural resources for their livelihoods than other socio-economic groups due to lack of alternative livelihood options accessible to them (Rietbergen et al., 2002). The population of LVB is primarily rural with majority heavily dependent on agriculture and livestock husbandry for their livelihood. Water availability largely determines when and where development can take place. Majority of the rural poor who practice rainfed agriculture live in fear of delayed or failed rains. Access to surface or groundwater is therefore of paramount importance and may be determined by how rights to land are contested and exercised. Effective development and management of water and other resources is therefore necessary for sustainable growth and poverty reduction in the Lake Victoria basin.

The local communities in the lake region face serious threats to their livelihood due to a number of factors and processes including abuse of resources and environmental degradation, rapid population growth, economic liberalization, HIV/AIDS and poor health, poor governance, unfair resource distribution and gender discrimination. Abuse of resources has taken the form of deforestation and pollution of the river waters (Ong'or et al., 2001). Flooding during the rainy seasons, inadequate access to irrigation and drinking water, rapid population growth, prevalence of weeds such as water hyacinth on the lake and poor governance continue to affect inhabitants of this region contributing to the state of general poverty in the region.

The rapid increase in population coupled with expansion of agricultural activities and industrialization within the LVB has not been matched by commensurate development of water resources. Between 1967 and 1997, the population of east Africa increased by 260% (from 32 million to over 83 million) coupled with a rapid increase in demand for water (Thompson et al, 2001). In the rural areas, water pans, ponds and other storage facilities which are important in water supply have not been maintained mainly due to shortage of government funds and breakdown in traditional water management systems, intensifying drought spells and changing rainfall pattern (Ochola et al., Undated). Concerning agriculture, inadequate funding, poor management, and lack of ownership of management policies has led to state-run irrigation schemes being 'handed-over' to users, with mixed results (see Blank et al, 2002).

Ability to capture the benefits of water either directly or indirectly may greatly improve welfare and income of the households within the basin. Many poor people around the lake use poor quality water that negatively affects their health and welfare. Investing in more reliable, higher quality, and more conveniently located domestic water or more reliable irrigation can quickly and significantly improve the lives of the poor (Soussan, 2004).

The poor are disproportionately affected by the high variability in the availability of water, as they are the most vulnerable to water related hazards such floods, droughts and pollution because of where they live (e.g. slums and hillsides), their limited access to appropriate technology, and other factors. Thompson et al (2001) found that 'unimproved water sources' (such as pans and springs) tend to be highly seasonal, leaving households prone to water shortages during certain times of the year. Vulnerability can undermine efforts to break the poverty trap and push even the not so poor into destitution by destroying their livelihood through shocks (Soussan, 2004). Hazards including floods and drought can be a formidable source of vulnerability to the poor as they destroy crops, property and life. Better water management can reduce vulnerability of rural production systems through ameliorating the impact of uneven rainfall distribution (e.g. through better water storage) and providing protection against hazards (e.g. through flood protection or pollution control) and can also indirectly provide more secure livelihoods.

But the contribution of water resources to sustainable livelihoods depends on how it is accessed and managed which may be influenced by the laws and policies. Degradation of natural resources that adversely affects livelihoods not only results from improper use of resources but from poor policies as well. Within the basin, agriculture has been given prominence over other forms of land use to the extent that areas that have been traditionally used by pastoralists are being subdivided and taken over by the farming communities (Mwangi, 2003). Pastoral areas have been converted to wheat growing zones in both Kenya and Tanzania. These lands were formerly held communally and ensured the survival of pastoral groups in water deficit areas.

Women are the main managers of many water resources; face the burdens of fetching water for use in the home and of coping when there is not enough water for domestic needs. Empowering them is critical to achieving more focused and effective water management that will benefit many other aspects of life. Women typically develop and maintain rural water supplies as an integral part of their agricultural and domestic management responsibilities. Valuing water as a commodity to be put to productive use tends to minimize the interests of women in water resources management because most financially productive uses of water which can be quantified are in irrigation, livestock and industry -all areas which provide cash output and are mainly managed by men (Maganga, 2002; Torori et al., 1996). Other important water uses including washing children, clothes and health benefits are not 'valued' and difficult to quantify in financial terms. Providing water at a fee might limit women's usage since they generally have less access to cash than men. Privatization and valuing of water as a commodity and selling to whoever can afford may disadvantage women and other marginalized groups further.

Customary land and water management systems

Natural resources in Africa have long been managed under traditional governance systems many of which still function at the local level. The indigenous resource management systems reflected the way communities organized their lives within the constraints of the environment in which they lived. Decision-making institutions focused on utilizing and managing environmental resources based on the knowledge of the community, and on achieving and maintaining social harmony (Kilahama, 1994). Customary systems of resource management generally run on the principle of community interest rather than individual benefit, and can generally be described as 'pro-poor', providing safety-nets for those without secure access to resources. However, there are significant gender-biases and differentiation according to age amongst most customary systems (UDSM et al, 2004).

Water management was usually the responsibility of local institutions with a number of other social and NRM functions. Indeed, land use and water management were often seen as two sides of the same coin. Land and water rights, to a large degree, were treated in indigenous systems as inherently connected. For example, in the Usangu

Plains, customary water rights were attained through the inheritance or renting of irrigated land (van Koppen and Sokile, 2004).

Customary water management systems

It has been noted that customary water regimes have generally been less comprehensively studied than customary land tenure systems (Hodgson, 2004). In recent years, much has been done to better understand the historical and current significance of customary water management systems in Tanzania, for example (see e.g. Maganga, 2002, Sokile and van Koppen, 2004, Huggins, 2003). However, this has been restricted to a few communities in specific geographical areas. There is need for more research, not least because in many cases, local custom has altered and become infused with elements of statutory law, resulting in locally-specific results.

Most indigenous systems of water management in the basin were based on the concept that water for certain, limited uses was a free, open-access resource, while access for other uses was regulated and controlled by specific groups (whether chiefs, elders, clan leaders, or household heads). It is possible to generalize that, amidst the great variation found in water governance systems, the amount of control increases in proportion to the degree of labour invested in the water source (Huggins, 2003). Customary systems of water management were by no means static. Regulations and technologies altered over time, and innovations were introduced as a result of cross-cultural exchange between communities as well as experimentation within single communities. It is often possible to trace the historical patterns of dissemination of water technologies as they spread from community to community. At the risk of generalising, it is possible to say that ownership of water sources was usually invested in the local community rather than the household. The nature of the community unit varied, and might include the clan rather than the village, for instance: this is the case amongst many pastoralist groups. Water was rarely 'owned' exclusively even by these groups however: access by others was often allowed, subject to permission being sought and reciprocal arrangements sometimes being made. There was therefore a link between land tenure and water rights, but this was based on community territories rather than individual land 'ownership'.

Customary land tenure systems

Within the Lake Victoria Basin, much of the land that was held either communally by local communities or in trust by government is increasingly being subdivided and registered as private property with individual titles. This has the effect of weakening the communal systems since they are legally subordinate to the written law (Torori et al., 1996; Doyo, 2003). The Kenyan portion of LVB includes protected state forests, large commercial tea estates, small holder farming areas, irrigated rice and sugarcane farms with property rights to agricultural land being very clear-all under private ownership with registered title deeds. For Tanzania, major land uses identified within the basin include extensive agriculture, extensive and mobile livestock production and, multiple use wetlands with customary rights being more prevalent (Swallow et al., 2001b). In Uganda, most agricultural land within the basin is held under customary systems, with patrilineal rules of inheritance (Place and Otsuka, 2000).

Most communities within the Lake Victoria basin are patriarchal and therefore family property (e.g. land) is inherited along such lines. This system of resource acquisition has impoverished women who despite catering for family needs do not have full rights over such property. Traditional institutions involved in natural resource management do not have balanced representation as men tend to dominate in most committees. Decisions emanating from such institutions may not be sensitive enough to women. Men also dominate decisions concerning investment, use and conservation of natural resources. Women have the traditional obligation of securing the family's food supply while men concentrate in income generating activities. Even though men and women may have equal chances to access common resources (e.g. land and water), women have very little control over their use and benefits accruing from the resources (Ong'or et al., 2001). Strict gender-specific division of labour in which specific roles are declared men's only while others are women's only is common among many communities. Where access to water is contingent on property rights in land, women may find it difficult accessing water for commercial but not domestic uses.

Among those communities where women have been inheriting land from their parents like the Baganda (Nyangabyaki, 2002), the problem remains as to how they can assert exclusive rights to such lands. Portions of

lands given to daughters can only be registered in their maiden names even when she is married. Clan elders support the idea to ensure the land does not pass to the clan of the man who marries their daughter (through co-ownership) or land being inherited by children of another clan while women support it to ensure that their husbands do not claim it (ibid).

Despite the declining influence of customary NRM systems, they still apply to some rural areas. Within the Nyando River basin, access to grazing materials may be allowed on private lands. After harvesting of annual crops for example, animals are found to be moving freely on such fields feeding on stalks left behind. At times, people restrict grazing because of degradation that may result and soil conservation structures present in their lands (Swallow et al, 2001a). Free ranging livestock have discouraged farmers from investing in private or public conservation structures, water pans or trees. In certain parts of Tanzania (Rufiji Basin for example), access to land and water for irrigation is still regulated according to customary arrangements where irrigation is carried out by gravity and simple canals constructed to divert water from their sources (Maganga, 2002). Here, villagers organize themselves into informal associations to construct irrigation systems in areas of erratic and unreliable rains with the construction becoming the exclusive property of those who participated though they need a permit for water use. Right to water for irrigation can be got either through the formal system where one applies to the relevant authorities or using the customary systems administered in various levels where customary law operates (local water committees, council of elders, village authorities etc).

Transformation of customary systems

Tenure security under indigenous system is weakening due to a number of factors including growing population pressure, a growing economy that is increasing the demand of outsiders and entrepreneurs for land, improper adjudication and a private land market. Introduction of private ownership upsets the social taboos that regulate communal natural resource management in the rural areas.

A good proportion of young people are moving out to urban areas looking for formal employment. This impacts negatively on the customary NRM systems since it is this group that is supposed to enforce decisions made by elders in a community. Due to increasing population, rural poverty and opportunities for income generation in towns, migration is becoming more common with people of different backgrounds settling together-(for example in irrigation schemes, markets and towns). This heterogeneity is weakening the influence of customary systems since it can only apply to people with some sort of relationship (usually clan or ethnic) that shares some common belief and practices (Huggins, 2003). Also, alternative systems have been put in place by the state, such as village councils in Tanzania, or the chief system in Kenya, which have competed with customary institutions for influence. Where traditional institutional arrangements have broken down, common property systems have been transformed into open access systems creating the false impression that the two systems are inherently similar (Akech, 2001).

The rapid population growth in urban areas partly due to migration from rural areas by those in search of employment is putting pressure on the infrastructure that were laid down immediately after independence to cater for a few people and coupled with poor management of some urban systems, the low income areas find it increasingly difficult to access water.

Communities in the LVB have been severely affected by HIV/AIDS and are having an increasing number of households headed by widows and orphaned children. Cultural practices such as “wife inheritance” have been blamed for the high prevalence of HIV/AIDS among certain ethnic groups. This impact negatively on the regions economic development in terms of human resource waste due to deaths and monies used in disease management. Women widowed due to HIV/AIDS sometimes lose rights to land as in where they are expected to marry husbands’ relatives but fail to do so (Loevinsohn and Gillespie, 2003). Many customary tenure systems provide little independent security of tenure to women on death of their husbands, with land often falling back to the husbands’ lineage (Drimie, 2002). This aggravates hardship and dislocation faced by women due to the many AIDS related deaths. Orphaned children also suffer because safety nets that existed in form of absorption by members of the extended family are breaking down due to the huge burden imposed by this disease. HIV/AIDS also destroys social capital through erosion of the knowledge base of society and weakening production sectors. It

decimates the fragile asset base of the poor when resources are used in managing diseases (Drimie, 2002). Disruption of the dynamics of traditional social security mechanisms and forced disposal of productive assets to pay for medical care and funerals leaves affected members in a precarious situation as ownership or access to rural land is central to many African families well being. In Tanzania for example, Rugalema (1999) found that HIV related illnesses affects time allocation, puts pressure on children to work, divert household cash and leads to disposal of productive assets like land.

Pastoralism though recognized as a viable land-use system in the arid and semi arid areas is being given very low importance by governments, development agencies and research institutions (Barrow, 1996). Many pastoral people e.g. the Maasai evolved sound ecological strategies and practices to enable them live in harmony with their environments. In all the three E.African countries, many of these enlightened indigenous knowledge systems and the associated institutional arrangements are in danger of breaking down as a result of "misguided" modern interventions. The trend has been to replace pastoralism with other lifestyles, not to improve and make the system more sustainable. A clear case in example is provided by the introduction of Ranching and Re-settlement Schemes in Kajiado district by the Kenya Government (Mwangi, 2003; Krugmann, undated). Such subdivisions created farm boundaries that excluded others from water sources (Mwangi, 2003). This has resulted in serious environmental degradation around watering points and new challenges to the pastoral groups. Pastoral property rights systems supported mobility across large areas with their land generally held communally with no one person having absolute rights to property (Kameri-Mbote, 2002). The traditional ways of pastoral grazing are therefore being subjected to more and more changes, leading to new problems. In Tanzania, allocation of rangelands to conservation bodies that do not incorporate the needs of pastoralists in their activities have denied them access to water and grazing areas (Kihacha, 2002).

Customary tenure rights within the basin are evolving toward stronger, more alienable individual rights as population pressure on land increases, technologies change and agriculture becomes more commercialized (Bruce et al, 1994). Freehold land is widely distributed on the Kenyan side of the Lake Victoria Basin. Despite the individualization of land ownership within the area, access to large water bodies (streams, rivers and lakes) is usually guaranteed. It is only the small water bodies like springs that can be found completely enclosed within a private land that access could be a problem. In areas where land is predominantly private, development of rural water supplies may lead to misunderstandings. In Kisii District (Kenya) where land tenure system is mostly private and characterized by high population density, land owners fear locating of public water pumps or pipes near or across their land holdings as this may give the government an opportunity to claim their land citing a public interest (Torori et al., 1996). Property owners on the other hand fear that allowing construction of public facilities (e.g. hand pumps) on private land will encourage encroachment on their property by outsiders seeking to use the facilities.

More than 50% of the lake basin population does not have access to piped water (WHO and UNICEF, 2004) hence depend on natural sources like springs, streams and rivers. Such sources should therefore be protected from any form of degradation. Unfortunately, urban centres along the shores of the lake throw their industrial and domestic waste into the lake and other water bodies. Government departments that are supposed to control pollution or degradation of water resources are still not decentralized in their operations, lack finance and human resources to effectively carry out their mandates.

Post-independence approaches to land reform and settlement differed among the three countries. Villagisation that took place in Tanzania in 1970s resulted in the formation of cooperative (ujamaa) settlements which were characterized by resettlement of Tanzania's scattered rural population into planned and permanent villages (Mascarenhas and Veit, 1994). The process involved significant changes in land-use rights for the purposes of redistributing land for infrastructure, agriculture and habitation with some groups losing their traditional land-some in more fertile places and some near homesteads. Resettlement also meant that some people could not reach their farmlands easily like in cases where they are ten kilometers away. In certain areas like Njombe, accessing land is a problem because much of the good land taken over by the government for ujamaa farms in the past cannot be

accessed by villagers unless they pay rent for a plot of land (Kihacha, 2002). The Village land Act and the Land Act 1999 recognizes customary land rights with certificates issued to protect customary property ownership.

Despite the nationalization of all land in Uganda in 1975, different tenure regimes are still common (Place and Otsuka, 2000). The most common are the customary tenure systems based on patrilineal rules of inheritance. Mailo land tenure system where the land belongs to the kingdom with individuals getting rights from allocation by the King is also common. Kenya's formalized land rights in many areas soon after independence. As a result, property rights to agricultural land are generally quite clear with most agricultural land being privately owned with clear title deeds (Swallow et al., 2001a). The extensive formal land registration carried out in Kenya has not improved land access or productivity (Bruce, 1994) due to interference with traditional system of ownership and production and speculation by absentee landlords. Moreover, many customary aspects cannot be simply 'legislated away'.

Liberalization of the market where governments no longer fixes both agricultural and livestock products prices has also created suffering and conflicts within households and between different groups due to lack of reliable and just market. Men have been forced to leave the cash crops they use to grow like cotton for food crops like sweet potatoes and other legumes that they sell to get some ready cash. This is denying women the control they have had over food crops and also the income they used to get from men.

Whereas traditional systems were communal in nature, introduction of private ownership has broken down the social bonds that regulated resource use and conservation. For the poor or the landless, individualization and registration of land as private property may mean losing access to necessary resources like water, grazing areas and firewood. Contrary to the belief that individual land title improves security of tenure and production, Akech (2001) found that individual tenure had not significantly improved agricultural production in Kenya where land had been subdivided and registered under individual titles. Moreover indigenous systems had the advantage of being flexible allowing various forms of land borrowing and leasing arrangements that accommodate needs of the landless.

National statutory systems of resource management

In all three countries, statutory systems were imposed by the colonial authorities. In most cases, the intention was to provide tenure security for settler communities, and for land- and- water uses which were economically and politically significant for that community. The resource management systems were completely 'top-down' in nature, centralized, and based on a 'command-and-control' ethos. Often – as in the case of Kenya, for example – laws were made to retroactively legalize situations which already prevailed, and the result was an opportunistic and inherently skewed policy and legal context (Kameri-Mbote, 2003)

Land management

Statutory laws may become a major source of livelihood uncertainty to the poor (Meinzen-Dick and Pradhan, 2002). Land registration considered by many people to enhance security against disputes is associated with complications and costs in the registration process and therefore discourages people from registering. Such costs include direct application fees and the transactions costs of time and travel involved in the application process. In Uganda, the 1975 land reform law that prevents people who did not previously register their land from obtaining freehold is a constraint while in Kenya, Bruce et al.(1994) found that titling by state tend to favour prospective investors because their claims to land lack legitimacy under indigenous systems while pastoralists and other seasonal users of resources are stripped of resource rights through cadastral survey and titling by elites and dominant ethnic groups.

Attempts to promote investment for wealth creation have often involved land being used as an incentive for potential investors. Local people have been dispossessed of their land and relocated elsewhere to give room for the investors. In Tanzania, villagers have been relocated wherever mineral reserves are discovered or to give room for industrial development without adequate consultation and compensation. Mostly such investment does not always benefit local people and may sometimes result in serious conflict.

Where registration of land and titling do take place, policy makers need to realize the danger of cutting off rights of household members other than the owners, and consider ways of preserving those rights as inherent flaws in the application of property rights to natural resources create serious threats to both sustainability and rural poverty alleviation (Shilling and Osha, 2003). Individualization has led to land concentration and increased marginalization and landlessness as people in positions of economic and political power take advantage of the less powerful (Bruce et al., 1994).

Land in Tanzania is categorized as either village, general or reserved land. On general land, allocations will be made under granted right of occupancy. In this the ultimate authority is the Commissioner for Lands. He is to be advised by Land Allocations Committee composed of officials from the Land Ministry appointed by the Minister. Village land is land that falls under the jurisdiction of existing registered villages while the rest would fall under general land. Village lands are to be managed by village councils under the supervision of the Commissioner. The Village Councils are ultimately accountable to the Commissioner thus by- passing both the village assemblies as well as elected local authorities. The commissioner has powers to take away the management of village lands form village councils under certain circumstances. In short, to all intents and purposes, the administration of land at the village level is top-down under the direct control of the Commissioner by-passing all elected organs at local level.

The policy of villagisation resulted in forced resettlement of millions of rural dwellers in over 8000 villages in Tanzania. In practice this meant a radical disruption of the land tenure system. Yet villagisation was not conceived or implemented as a programme of land reform. According to Shivji (1977), the havoc created by villagisation in the land tenure system was fully appreciated only in the 1980s when, as a result of liberalisation, former customary owners in villages began filing hundreds of lawsuits threatening to evict new settlers and thus reversing villagisation. This was one of the major reasons behind the appointment of the Presidential Commission to Inquire into Land Matters in 1991. The legislation which resulted offers some protection to customary land rights. Longstanding occupation or use of land has been recognised and is to be secured by the law. This is envisaged under section 3(1) of the Land Act, 1999 which protects people who have acquired land and are using the land without apparent lawful title to its use and occupation. The Land Acts also provide security of land tenure through a Certificate of Customary Right of Occupancy whereby a person who has a certificate under customary rights of occupancy is entitled to own land indefinitely.

Water management

The three countries under discussion here have all subscribed to many of the fundamental principles underlying the Integrated Water Resources Management (IWRM) paradigm. IWRM seeks to address in an integrated, coordinated and balanced way, the needs of upstream and downstream users, current and future beneficiaries, different water uses (such as environmental, agricultural, pastoral and industrial uses), supply and demand factors, social and economic benefits, and other aspects of water management (see e.g. McGranahan and Satterthwaite, 2004; and Maganga, 2002) IWRM is based on the Dublin Principles, of which subsidiarity and participation of water users in management are important elements. The Principles agreed at the International Conference on Water and Environment, held in Dublin in 1992, are as follows:

- Freshwater is a finite and vulnerable resource, essential to sustain life, development, and the environment.
- Water development and management should be based on a participatory approach, involving users, planners, and policy makers at all levels.
- Women play a central part in the provision, management and safeguarding of water.
- Water has an economic value in all its competing uses and should be recognized as an economic good.

The use of the hydrological basin and catchment units for planning purposes, rather than administrative units, and improved coordination between different sectors and government departments are significant.

While IWRM is undoubtedly the current hegemonic paradigm in global water management, it is not without its critics. In order to problematized such a dominant concept, it is first important to identify the nature of the phenomena itself. As with any paradigm, IWRM is a product of a discourse, or an exchange of information and

ideas between various actors. Information becomes validated and seen as 'authoritative' through processes of repetition and refinement which take place within networks of influential actors, such as scholars, scientists, policy-makers and donors. Seminars, conferences, and websites form importance nodes between networks, as Escobar (1998) notes in the case of the 'biodiversity' discourse. The funding which allows publication, research, and discussion of the ideas is very important in driving or shaping the process. It is useful to note a few significant aspects the process by which an idea becomes hegemonic. First, although the documents and data used to build the concept may make reference to the local level, actors at the village level are completely excluded from the process. In the case of water management, much of the discussion has until recently been based on 'hard science', to the exclusion of the 'soft sciences', such as social or legal anthropology (Swatuk, undated). Secondly, although the IWRM paradigm is often portrayed as a neutral, 'rational' and 'scientifically-based' concept, it is inherently political – as it determines the processes by which important resources are distributed – and those who are involved in IWRM bring both conscious and unconscious ideologies to bear on the exercise (Swatuk, undated). Thirdly, the development of a dominant discourse is rooted in temporally and geographically specific events. For example, the "assumption that water scarcity is a matter of physical, not economic, scarcity" (UDSM et al, 2004) was influenced, in the 1990s, by the frequency of drought events in Eastern and Southern Africa (Swatuk, undated).

For example, IWRM is heavily influenced by narratives of water scarcity, particularly at national and global levels, which has led to an emphasis on increased efficiency of water use and demand management. While water scarcity is a reality, in many areas inadequate water access results from poverty (itself a product of political, institutional or economic factor) rather than scarcity, and often the poor remain unable to access safe water even where water is plentiful (McGranahan and Satterthwaite, 2004). In some cases, efficiency and institutional self-sufficiency have become management priorities to the detriment of other issues which may better represent the needs of most local people, and in particular the poor. This is the case in Zimbabwe for example, where new institutions "emphasize resource management and generation of revenues, not the water-related development projects of greater interest to poor communal and customary area farmers" (Derman et al, 2002) Across East Africa, in contrast to parts of Southern Africa (particularly South Africa) and the West, most major river basin flows remain 'open', with some water available for allocation, rather than 'closed' due to abstraction of all available water (other than that base flow necessary to support environmental functions).

While the design of different IWRM institutional structures have similarities from country to country, the implementation of the system of course differs greatly. One important decision at the start of the process is whether the concept should be piloted before the national-level legal and institutional structure is put in place. This is an important political question, especially in areas experiencing high levels of inequality between stakeholders. According to Manzungu (2004) the 'progressive' approach taking in South Africa, where basin institutions are established progressively over time and the legal framework is established later, at a pace set by the stakeholders involved, risks the entrenchment of powerful interests in the process. In Zimbabwe, by contrast, the legal framework was put in place and then the formation of WUA's followed. In Tanzania, the 'progressive' route has been followed. While the power relations between stakeholders may not be as blatantly skewed as in South Africa – where white-owned farms and industries largely control water allocation at the expense of local smallholders – this approach does risk the dominance of some stakeholders. For example, the prominent role of the state electricity utility, TANESCO, in funding and supporting certain activities within the IWRM and basin-management context in Tanzania has been perceived negatively by some actors.

As for irrigation, the capacity of the government to manage large scale irrigation schemes has collapsed and farmers are taking over such responsibilities informally (Blank et al., 2002). In the past, the state owned the land and cultivators became lessees with temporary occupation licenses which recognized only the alottee and his/her spouse, and allowed the state to evict them. The state regulated the kind of transactions that may be conducted, crop planting timetables and marketing of crops. Land tenure was very insecure and a major disincentive for any investment by the cultivators. In Mwea Irrigation scheme Kenya, for example, the National Irrigation Board which used to run irrigation schemes did not manage to carry out its role effectively leading to misunderstandings between Irrigation Board Management and farmers. At some point, the board couldn't control the crops grown and illegal water use (Kabutha and Mutero, 2002). Finally the Board had to pull out and leave the management to

farmers cooperative. Unfortunately, farmer's cooperatives currently do not have the human and financial resources needed to run the scheme.

Though holders of private property have the right to determine the use of their property and dispose of it, the state has the right to establish easements on private land, which limits the right of landowners. Creation of easements involves taking from owners some of the rights to use their land in public interest as is the case with zoning or other land use regulations (Torori et al., 1996). Easements provide access to water resources which would otherwise be prevented by private land ownership. This is particularly important in rural areas in order to provide access to surface water for livestock and domestic purposes for those who are not riparian owners. Easement is also essential for the development of public water supply systems which require piping water across large distances (e.g. from source to market centres or schools). Easements are therefore important because they disaggregate the bundle of rights associated with land ownership into distinct functions including, the right to pass over private land (Torori et al., 1996).

Governments have too much power and rights over water in terms of ownership/ trusteeship and the regulatory functions hence other stakeholders are often not adequately involved in the decision making process more so due to the centralized approach usually adopted when dealing with water issues. This may create conflicts over water resources as some of the decisions taken may not take cognizance of different but important needs, resources and management systems found in different areas. Even though individuals do not own water, there is need for some compensatory measure to be put in place for those owning the land where water sources are found.

Men still dominate the decision making process. Women need to be more involved in the planning, operation and management of water and sanitation programs. If they get reliable, safe portable water supply, they will be able to re-channel their time, energy and labour into more income generating endeavors and social activities. But as much as water interventions should be gender- sensitive, it should not be seen as women's problem but rather everybody's concern and therefore men should also contribute time, labour and cash towards such activities more so if such interventions are to be sustained and have significant impact.

In Kenya, the Ministry responsible for water has been the principal agency responsible for the management, development, operation and maintenance of water supplies, sewage disposal and pollution control. The Water Service Regulatory Board (WSWB) under this ministry is the top organ for water management decisions and issues licenses for water use. Immediately below it are the seven Water Service Boards namely Nairobi, Central, Coastal, Rift Valley, Lake Victoria North, Lake Victoria South and the Northern.

Some applications are made to the Water Catchment Boards while some are made to the district water boards depending on whether it is going to have an inter-basin transfer or not. The Water Catchment Boards approve water permit applications from within their catchments; formulate recommendation on water use and conservation and are supposed to monitor and enforce water use regulations in the catchment area. Though functional, catchment boards lack resources, political support and legal power to have their decisions implemented. District Water Boards on the other hand follow the administrative boundaries and have stronger affiliation with the provincial administration (Huggins, 2003).

Tanzania is characterized by a pluralistic legal system where land and water resources are regulated by different pieces of legislation and institutions including statutory law and customary laws of the 120 plus ethnic groups among others (Maganga, 2002). In cases of conflicts over natural resources, authorities tend to refer to state laws which do not necessarily protect the interests of the poor and other marginalized groups.

Five levels of water management recognized in the 1995 Water Policy include the National, Basin, River Catchment/ Sub-Catchment, District and Livelihoods/Water User Association Level which are a mixture of hydrological and administrative units (Huggins, 2003). The 'ten–cell' group or ten-house unit is the lowest level of governance in Tanzania whose leader is 'co-opted' in the village council. Village councils elected from village assembly are vested with the legal authority and political power to initiate and manage development activities and

have the responsibility of running their small water supply systems while running of larger systems remain the responsibility of regional/national authorities (Maganga et al., 2001). It was hoped that the village system would provide a viable institutional basis for locally based management of natural resources but poor definition of responsibilities and development goals and attempts by some councils to take control of development projects for their own benefit makes them unpopular (Huggins, 2003). As for the Village councils they may not be impartial due to their close linkage with local politics and therefore should be replaced with users association because not all villagers use a given water resource (Huggins, 2003).

For a long time, Uganda has had no clear policy on water. Instead there have been legislations scattered in different sectors, limited in scope and aimed at management and distribution of urban waters (Ntambirweki and Dribidu, 1999).The Water Statute (1995) is one of the major pieces of legislation dealing with water in Uganda. The right to investigate, control, protect and manage water in Uganda for any use is vested in the government and exercised by the Minister or Director of water development. It is an offense to allow or waste, misuse or excessively consume water. The Minister is authorized to prescribe time; manner and places from which water may be extracted for use or in times of shortage/anticipated shortage regulate water to be used for particular purposes. Some government departments have many responsibilities but without the necessary resources to undertake such responsibilities. UNEP/UNDP (1999) found that the water policy committee charged with the responsibility of advising the minister not to be operational due to financial problems even though it could have gone a long way in assisting the government to come up with good policies.

Non governmental organizations are also involved in water supply and sanitation, some concentrate on water supply and sanitation as core activities while others see this as complementary to their main activities such as health and agriculture. At times, they are more effective than government due to their small size, flexibility and cost effectiveness in operations reflected in their ability and willingness to experiment with new technologies. Some also have grass root links with communities. A weakness common to many NGOs is that at times they do not stay long enough to evaluate the performance of projects they initiate. Agreements reached with private land owners concerning the siting of wells and water tanks may at times be disregarded after the sponsors pull out with some land owners excluding other people from using such ‘communal’ property. Some of the technologies introduced by NGOs to help the poor may be inaccessible to them due to the high costs involved.

A number of regional organizations formed by the three governments with the assistance of development partners have been instrumental in the managing the Lake’s resources and surrounding areas. The Lake Victoria Fisheries Organization and Lake Victoria Environmental Management Program are some of the regional bodies with mandates over shared natural resources. Though they can assist in coordinating the use and management of the basin’s resources, the limitations such regional bodies face include the fact they can only make policy recommendations but not implement since only national governments are mandated to do so. But with current moves towards a unified East African community, such regional bodies need to be strengthened to help in coordination of regional efforts in managing shared resources.

Performance of statutory systems

For a long time, legislation governing natural resource use in east Africa has been sectoral and uncoordinated. Such laws formulated during the colonial period have weaknesses because they were aimed at resource exploitation rather than resource conservation. Currently efforts are being made to revise most of the policies and legislation to reflect the current situation. The Environmental management and coordination Acts are being used by the three countries to coordinate and promote sustainable management of the environment. Committees comprising heads of various departments and representing different groups have been formed from the National to lower governance levels. This may help in coming up with relevant management systems that takes into consideration the prevailing local conditions

Systematic land registration exercises are usually followed by widespread failures to register transfers and successions leaving the accuracy of registry records in doubt. Also most smallholders continue to consult family or relatives before selling or mortgaging their land contrary to expectation that registration will allow them to carry out such transactions independently. This is because some of the important issues are not given adequate attention. Some people may not be aware of the formal legal provisions while some might find it costly in terms of time and money especially where courts and legal service providers tend to be concentrated in urban areas. Systematic titling and registration may only be appropriate where land has become valuable, is the subject of intense competition and disputes and where customary tenure is failing to cope with the conflicts or land is being distributed by the state in connection with a project involving resettlement (Bruce et al., 1994). For the government departments concerned with land registration, refusal to register land transactions, successions and transfers, resulting in double dealings and changing of minds compounds the problem as they cannot settle all the cases. Land control boards at lower level of governance charged with regulating land transfers and mortgages are ineffective, give economic growth priority over equity and can be easily manipulated by powerful people.

Success of private property regimes depends on the availability of an extensive legal and governmental infrastructure; on whether property owners or claimants to use rights can afford the costly legal system; and on whether there are mechanisms to recognize public goods and enforce community interests (Shilling and Osha, 2003). These conditions are rarely realized by the rural poor in developing countries. Registration of land for individuals especially for the poor can be exceedingly burdensome, if even possible. In areas with weak institutions, rights are not enforced and individuals are left without legal recourse even where properties can be assigned to individuals.

Knowledge of rights and information about the way government functions is lacking in rural areas making it hard for rural population to put pressure for change in systems that discriminates against them both in the allocation of resources and in pricing policy of their produce. In all the three countries, a large section of the population is not adequately informed about such issues as water rights-what they are entitled to, when permits are needed, procedure involved in applying for such rights, water user fee and their responsibilities. In Tanzania, lack of an effective mechanism for disseminating information on water rights applications and decisions contributes to resentment and suspicion as some of the rural communities have very low literacy levels (Huggins, 2003). As publication of water rights application in local newspapers may not be sufficient for the people to follow such regulations, summaries of the various water Acts and other major decisions should be produced in Swahili and other local languages for easier understanding and to raise awareness as widely as possibly (Huggins, 2002). Swallow et al, (2001a) found government support and enforcement of existing legislation against improper natural resource use being weak in western Kenya just like other parts of the basin.

Ministries in charge of water affairs have been highly centralized and therefore not able to fully involve local communities in planning, monitoring and management of water resources yet they cannot carry out all these functions satisfactorily. There are cases where water abstractions permits issued have exceeded the water available within a basin due to lack of up to date information. Water bailiffs, officers of the water boards responsible for monitoring and enforcing water use permits have been manipulated in the past by applicants to influence the outcome of their application by inviting and paying for their visits during periods of high flows. Ideally, inspections should be done during dry periods and results compared with long term averages before a decision may be reached. But considering the limited resources allocated to the ministry together with the lack of up to date information on all water sources, this has been difficult to follow.

The sectoral nature of water management has not helped matters either. It has been found out that giving responsibility of conserving water resources to so many institutions is not effective and creates procedural difficulties and tendency of failing to take action hoping the other will.

Irrigation schemes have byelaws governing water use (e.g. water distribution regimes) and management issues which are hardly enforced. Water theft remains common among farmers having neighboring plots breaching walls of the schemes to water their crops out of turn and not paying any fee (Gikonyo, 2003; Huggins, 2002). Difficulty

in enforcing these bylaws can partly be attributed to the lenient fine or penalties and lack of resources by those supposed to enforce such regulations (e.g. the irrigation unit). Until 2002, fines for water related offences in Kenya hardly exceeded US$14 (Mr. Nyaoro-Registrar of Water Rights; pers.comm). Also rules governing membership of management committees are not often followed with some individuals serving for too long thereby compromising rules and regulations (Huggins, 2002). Changing irrigation technology where people are relying more on small pumping and water-lifting devices owned and operated by individuals to irrigate their land has also created a new challenge to governments in the region as policing such people becomes difficult (Blank et al., 2002).

Customary land and water rights in water resources management

Due to the many challenges being faced in the water sector, new strategies for managing water resources have been initiated. Included is the greater involvement of private sector and water users in management of water resources. These approaches are expected to improve the management and delivery of services by bringing together the different stakeholders and mobilizing the necessary resources which governments lack.

Rural communities are being encouraged to form water user associations (WUA) to help in addressing their water needs. Such associations are often more able to mobilize labour and other resources needed to improve water body management through establishing and enforcing rules of access and duties of the users. They have been born partly out of the need to complement government efforts in water supply, increase user's participation in water resources management and to establish dialogue between water users due to increasing scarcity. Their involvement in water management is expected to improve access and fair distribution of water among the different users and help in the conservation of catchment areas. This approach is considered useful alternatives to the poorly functioning centralized approach to water resource management that has contributed to undermining sustainable community practices and traditional knowledge on water management (World Bank, 2004).

Attempts to involve users in water management have been viewed differently by various groups. While some see it as a reaction by governments to pressure from development partners to hand over the responsibilities they cannot afford to take care of, others view it as the only way through which authority may be devolved and users empowered to participate in the management of resources. It is feared that creating new institutions including smallholder irrigation scheme user associations that emphasize resource management and revenue generation and not water-related development will neither broaden access to the new institutions nor address equity in water distribution. They may instead disadvantage the poor when they distort customary institutions (Derman et al, 2002; Van Koppen et al., 2004). In Tanzania which has a long history of irrigation, formalization of water rights created a large number of illegal users that the government found hard to deal with (Maganga et al, 2003)

Results from involvement of users associations in water management are mixed. In certain areas, they have provided mechanism for allocating water to different users (as water rights are usually given to organizations and companies) and solving conflicts that arise from the competing uses while in other areas, they have encouraged excessive extraction of water by organized groups especially where members pay for the water as they try to get the maximum from their water rights. It is therefore important that adequate measures are put in place to ensure that WUA help in promoting equitable water distribution among the different groups. Given adequate local leadership and commitment, some communities are able to rise above the constraints of poverty and provide viable services as alliances can help disadvantaged groups have a stronger negotiating position (Meinzen-Dick and Pradhan, 2002).

As much as formal natural resource-based associations may provide a significant step towards improved management systems, they are not necessarily equitable or representative unless positive steps are taken to make them so. Public access points or rights should be provided to those who do not own riparian land where such association exists to avoid excluding local rural population from accessing water. Public interest (both present and future) must be taken into consideration and this can only be possible if government retains ownership of water body itself otherwise such exclusion may be passed over to future generations.

Even though privatization of water services has focused more on drinking water, access to water for agricultural production is equally important considering that it is the main source of livelihood for majority of the basins

population. The greatest impact as far as poverty reduction is concerned could be felt through addressing the problems facing this sector. The changes being instituted in the water sector though well intended may come at a cost to certain income or livelihood groups in society unless appropriate measures are put in place to protect the very poor and marginalized groups. Rural areas in east Africa have generally been left behind in terms of water infrastructure coverage. Thomson et al. (2001) found that despite a decrease in water supply coverage from 83 to 80 percent in urban areas between the year 1990 and 2000, it was still much higher compared to rural areas whose coverage increased from 36 to 40% between the same years. This underscores the need to address causes of poverty and greater disparity between urban and rural areas even as new water management approaches are being put in place. For certain communities, access to water for irrigation or watering animals may be important. Their concern will therefore be on how the new management systems may improve access to unimproved water sources and not necessarily drinking water.

In certain areas, it has been found that inadequate water access results from political, institutional or economic factors and leads to water deprivation even where it is plentiful (McGranahan and Satterthwaite, 2004). Under such circumstances there may be little to do with efficiency which is one of the major arguments being advanced for involvement of the private sector in water resources management. Where expansion of the water supply infrastructure is key to improving water access for example, tenure problems that may have hindered extension of public utilities will still remain even with the involvement of the private institutions. Debate or arguments over private sector involvement should focus widely on the socio-economic issues as well.

Apart from encouraging the formation of water user associations, there is need to ensure that users are not only adequately represented but also effectively participate in decision making. Devolved governance system is supposed to provide such opportunity but experience from Uganda shows that users are still left out when it comes to making important decisions. Privatization of water services has been largely discussed at the national level despite the presence of devolved governance structure.

Change in management of water supply and distribution is needed but the government must retain some measure of public investment, state planning and regulation as complete private ownership of water resources is neither likely nor desirable due to equity and strategic national development considerations. Because of the overwhelming public interest in water, popular participation in decision-making is necessary. Reservations about adopting demand-driven principles wholesale are partly because the approach tends to be biased towards urban dwellers.

Conclusions

- Currently, land tenure issues are not adequately addressed in water legislation and policies in the three countries
- Customary land and water rights remain the most significant forms of rights in most parts of the basin. However, they are not addressed through legal or policy frameworks
- Changing irrigation technology involving the use of small pumps is creating additional challenge in policing of water resources
- Reforms in the water sector should focus on productive uses of water as well
- Information collection and sharing should be improved for better decision making
- Regional institutions need to play a more active role in the management of shared resources

Areas for further research include:

- Connections between Village Councils and Water User Associations in Tanzania: are those Village Councils that are involved in land use planning at the local level, also involved in the allocation and management of water rights? If so, what does this mean for the relationship between land and water rights regimes?
- Performance of Water User Associations. How can they be made more effective in safeguarding water rights of the poor?

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