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Barbara van Koppen, Barbara Nompumelelo Tapela and
Everisto Mapedza


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van Koppen, B.; Tapela, B. N.; Mapedza, E. 2018. *Joint ventures in the Flag Boshielo Irrigation Scheme, South Africa: a history of smallholders, states and business.* Colombo, Sri Lanka: International Water Management Institute (IWMI). 43p. (IWMI Research Report 171). doi: 10.5337/2018.202

/ joint ventures / irrigation schemes / smallholders / farmers / agribusiness / farming systems / agricultural policy / small scale systems / irrigated farming / land tenure / land ownership / resettlement / gender / public-private cooperation / contract farming / water resources development / food security / infrastructure / labour / state intervention / crop production / cotton / policy making / accountability / South Africa /

ISSN 1026-0862
ISBN 978-92-9090-862-3



*Front cover photograph shows* a farmer in the Ikageng women's garden, Strydkraal, Flag Boshielo irrigation scheme, South Africa (*photo:* Pinnie Sithole*).*

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# Acknowledgements

The authors gratefully acknowledge the support of the Department of Agriculture, Forestry and Fisheries (DAFF), Government of South Africa, for this study. They also appreciate that the CGIAR Challenge Program on Water and Food (CPWF), which has been integrated into the CGIAR Research Program on Water, Land and Ecosystems (WLE), enabled the implementation of four case studies in the Flag Boshielo irrigation scheme. Tushaar Shah (Senior Fellow, International Water Management Institute [IWMI]), Fraser Sugden (Senior Lecturer in Human Geography, University of Birmingham, UK [formerly Senior Researcher, IWMI]), Alex Bolding (Assistant Professor, Water Resources Management, Wageningen University and Research Center, the Netherlands) and Ian Makin (Interim Deputy Director General [Research for Development], IWMI) are also thanked for their excellent comments on earlier drafts of this report. Any omissions or errors remain the responsibility of the authors.

## Project

This research was commissioned as part of the Programmatic Collaboration *Revitalization of smallholder irrigation in South Africa* between the Department of Agriculture, Forestry and Fisheries (DAFF), South Africa, and the International Water Management Institute (IWMI).

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This research was carried out as part of the CGIAR Research Program on Water, Land and Ecosystems (WLE) and supported by CGIAR Fund Donors (http://www.cgiar.org/about-us/ourfunders/).

# Contents

# Summary

In the global debates on the modes of farming, including irrigated farming, that are viable for the majority of rural people, three models prevail: (i) smallholder family farming; (ii) farming led by agribusiness' capital, technologies, and forward and backward linkages in an estate mode; and (iii) agribusiness-led farming in an out-grower mode.

In South Africa, these three and more modes of irrigated agriculture have been implemented. In the colonial era, in most of the country, the state supported a white-dominated estate mode of farming based on wage labor. Smallholder family farming remained confined to black people in the former homelands. Smallholder irrigation schemes in the former homelands were out-grower schemes, managed by the colluding apartheid state, white agribusiness and irrigation industry. Since independence in 1994, the search for viable modes of farming and irrigation is high on the policy agenda. This is part of the envisaged transition of the state into a tripartite constellation of citizens, state and service providers that delivers accountable, outcome-based services.

Smallholder irrigation schemes in former homelands face particular challenges in this transition. One of the piloted solutions is a blend of the estate and out-grower mode of farming: the joint venture. Smallholders pool their plots and hand over the land for management by a strategic partner from the agribusiness with capital for inputs, technologies, and linkages to input and output markets. The government ensures the construction of irrigation infrastructure. However, the results of this option were mixed.

As a contribution to the search for viable modes of smallholder irrigated farming, this report analyzes the events and outcomes of smallholder irrigation schemes in former homelands where joint ventures were piloted. The method used is an in-depth historical case study (or 'biography') applied to the Flag Boshielo irrigation scheme in Limpopo Province. Situated on the riparian strips along the Olifants River, the overall scheme consists of a row of 13 smallholder sub-schemes (or 'farms') of about 100 hectares (ha) each on the right bank and one smallholder sub-scheme on the left bank. Six joint ventures have been implemented since 2001; three, which had started in 2009, had discontinued by 2012.

The report starts by tracing the early dispossession and later resettlement of black smallholders under the gendered apartheid policies of forced removals, divide and rule to break resistance, food security, and white agribusiness and irrigation development. In these out-grower arrangements, smallholders were food secure, but not more than laborers on their own fields, while subsidized parastatal development corporations managed inputs, production, irrigation, storage and sale of the produce.

When the apartheid structures were dismantled in the new dispensation, the irrigation schemes partly or fully collapsed. In the Flag Boshielo irrigation scheme, some of the smallholders tried to continue irrigating, organize loan facilities, and gain access to input and output markets. Two tribal authorities leased their land to white commercial farmers. In two other sub-schemes, the cotton industry tried out-grower arrangements, but this failed. One joint venture was piloted. The new government designed a national participatory, inclusive Revitalization of Smallholder Irrigation Schemes (RESIS) program. However, in Limpopo Province, this was brusquely replaced by RESIS Recharge, in which a joint venture became the exclusive option. This was hailed as progressive, economically viable, business-like farming. In the Flag Boshielo irrigation scheme, five sub-schemes accepted, all with the same strategic partner as the pilot farm; the other rejected.

In the tripartite constellation, the government financed the design and installation of a new method of high-tech sprinkler systems ('floppies'), as promoted by the continuing irrigation industry. The strategic partner contractually committed to share half of the net profits with the smallholder cooperative, transfer business skills and to create employment – in this area with high

unemployment rates. Attracted by quick money, smallholders organized in cooperatives, pooled the land to fit the centralized irrigation and other mechanization, and handed it over to the strategic partner. They waited as 'armchair farmers' until the money would come or not. In seasons in which the strategic partner announced that there were net losses, smallholders' grievances came out most strongly. The main complaint was the lack of transparency, especially about the total income gained. Moreover, skills were hardly transferred and new employment was limited in this capital-intensive farming system. The contract had no enforcement clauses and gave no power to smallholders, neither vis-à-vis the government nor vis-à-vis the strategic partner. The latter referred the smallholders to the government and left with his capital, technologies and market connections when conflicts escalated.

Out of the six, three joint ventures continued. Two chose another strategic partner. In the third, land conflicts among the smallholders, and between the smallholders and the state temporarily halted production. The other three joint ventures broke down in this way. Here, smallholders bore the brunt of the costly pilot. They had forfeited other production opportunities; they had lost production during the years of new irrigation infrastructure construction; the fertility of their soils was reduced as a result of a quick-win production strategy; and vandalism and theft of the equipment were rife, aggravated by unclear ownership of the pooled land without the former individual tenure.

These experiences immediately led to new provincial and national irrigation policies that emphasize inclusive, participatory irrigation development for all categories of farmers. Instead of focusing on irrigation infrastructure alone, the wide range of production factors of inputs, training and marketing are addressed. Joint ventures remain as one of the options, on condition that smallholders have a strong say in bilateral decision making with a strategic partner. The government enables and monitors such joint ventures.

The report concludes with recommendations on how to further operationalize these policies. For joint ventures, recommendations include a robust bilateral contract between the strategic partner and smallholders with clear goals and enforcement of employment generation, production and marketing skills transfer and contacts, risk management and internal governance. Support to exchange among peers is also recommended. Further, smallholders in joint ventures and other public smallholder irrigation schemes would benefit from stronger land tenure arrangements backed by the government. Government support is also key to diversify irrigation technologies for women and men smallholders. Lastly, further comparison of different joint ventures and between joint ventures, smallholder schemes, and the continuing spontaneous initiatives in the Flag Boshielo irrigation scheme and elsewhere, will shed more light on viable modes of irrigated farming that achieve job creation, food security, poverty alleviation and skills development.

# *Joint Ventures in the Flag Boshielo Irrigation Scheme, South Africa: A History of Smallholders, States and Business*

*Barbara van Koppen, Barbara Nompumelelo Tapela and Everisto Mapedza*

## Introduction

### Rationale

#### *Farm Size and Mode of Farming*

For over a century, debates about the relation between farm size, mode of farming and land productivity have shaped agrarian policies, programs and research across the world. Until the 2000s, the pendulum tended to swing towards small-scale family farming. An inverse relationship between farm size and land productivity was widely found in Asia (Berry and Cline 1979). Millions of smallholder families cultivating 1 hectare (ha) or less intensified production for food and income. Their productivity depended on access to production factors, in particular fertilizers and irrigation, and access to rewarding output markets. Family members had more incentives to produce than wage laborers on larger farms. Larger farms were only more productive per unit of land when certain mechanization, such as tractors, started enabling economies of scale. Accordingly, agricultural policies in countries such as China and India primarily supported smallholders. In China, where land distribution became fairly egalitarian, this smallholder policy led to massive poverty alleviation and broad-based economic growth.

Anecdotal evidence in sub-Saharan Africa, including South Africa, also confirms equal or higher land productivity in smaller farms. For example, the review of land tenure systems in Zimbabwe conducted by Rukuni Commission (1994) highlighted the fact that economies of scale do not seem to apply in agriculture. In the Nwanedzi river sub-catchment in Limpopo Province, South Africa, a comparative study of land productivity among diverse producers found no real difference in land productivity between micro-farmers and the large-scale commercial mango and cattle producers (Boche and Anjuère 2015). Again, land productivity depended on skills, labor relations, and access to inputs and markets, and not on the farm size per se.

However, since the financial and energy crisis of the late 2000s in particular, the pendulum of the discourse in agrarian low- and middle-income countries is swinging towards large-scale farming by agribusiness with wage laborers or smallholders. This discourse justified the surge in foreign and national investors prospecting land and, through governments, purchasing large tracks of African soils and related water and mineral resources, which is also dubbed 'land grabbing' (Cotula et al. 2009; Hall 2011; Borras and Franco 2012; Anseeuw 2015).

The claimed benefits of agribusiness include the following three sets (Hall et al. 2015) – (i) agribusiness would bring the indispensable financial capital to invest. In this neoliberal era, in which the undersourced governments lack the capital to invest and kick-start broad-based agricultural development, the corporate sector promised to fill the gap; (ii) agribusiness would introduce new technologies and skills for mechanization and related economies of scale for higher land and labor productivity. The promise was that these skills and technologies would be transferred to local smallholders; and (iii) large-scale agribusiness would open up new

backward linkages to national and foreign input and agrarian technology providers, and forward linkages to global markets. Large volumes of produce of standard quality would better satisfy demanding consumer markets. This is especially the case in Africa's rural areas, where agricultural productivity stagnated while populations kept growing alongside strong urbanization, and the promises of capital mobilization, technological innovation, and new forward and backward linkages through large-scale agribusiness were appealing. Indeed, this promise that national and foreign direct "...investments in large-scale commercial agriculture would result in technology transfer – which benefits small farmers, provides much-needed food for local markets, creates decent employment for the youth, earns foreign exchange and forms the basis of industrialization – has proven irresistible" (Hall et al. 2015).

Agribusiness-led farming covers a multitude of configurations between agribusiness, government and smallholders or local wage laborers or both. Bernier and Meinzen-Dick (2015) listed the activities in these configurations: authorization, planning, financing, irrigation system construction/ replacement, operation and maintenance, on-farm construction and operation, technical advice, production, processing, marketing, and risks and benefits assumed.

One distinction in these configurations is based on land tenure arrangements. At the one end of a continuum is the estate mode, in which agribusiness holds the land titles and manages the farm, while local people become laborers on the land of their ancestors. In South Africa, the colonial powers introduced this mode of farming in the former white Republic of South Africa (RSA), covering 87% of the country's territory, where it relegated Africans to tenants and wage laborers. Small-scale agriculture in the remaining 13% of former homelands continued primarily to serve the reproduction of the labor force (Bundy 1988).

However, in both South Africa and other African countries, land appropriation has met with strong opposition. In South Africa, land redistribution and land restitution became important policy goals of the independent government after 1994. Elsewhere in Africa, land purchase and the estate mode of farming are also increasingly contested (Borras and Franco 2012; Hall et al. 2015).

At the other end of the continuum is contract farming with smallholder out-growers, who keep their land and manage production. Contracts with the agribusiness are about input provision, extension and purchase of produce. This was the mode of farming in the irrigation schemes in the homelands during the apartheid era in South Africa. In Southern Africa, nowadays, out-grower arrangements are common in sugar production, in which smallholders have plots in large-scale irrigation schemes. Agribusiness can also contract dispersed smallholders, which happens in cotton or tobacco cultivation. However, for all other crops, the policy focus on smallholder agriculture, local inputs and market development remains strong.

In-between the estate and out-grower mode is the joint venture. This mode was piloted in post-1994 South Africa on large-scale farms that were redistributed and restituted to groups of smallholders under land reform. In these joint ventures, land and labor were provided by smallholders, while so-called 'strategic partners' managed the, often mechanized, cultivation process, inputs and marketing. However, these joint ventures often discontinued (Hall et al. 2003; Lahiff et al. 2012). Joint ventures have also been piloted in the smallholder irrigation schemes in South Africa's post-1994 former homelands, and are the focus of this report. These joint ventures replaced former out-grower arrangements, which had collapsed with the dismantling of the apartheid structures in the new dispensation. The results in the former homelands were also mixed.

With these experiences and critiques, the South African government increasingly emphasized diversity in smallholder farming styles. For example, the Presidency and the Department of Agriculture, Forestry and Fisheries (DAFF) distinguish four typologies, each requiring different producer development support: (i) subsistence farmers mainly depending on homestead gardening; (ii) smallholders in 'loose' value chains (for example, selling on local markets); (iii) smallholders in 'tight' value chains (such as out-growers in sugar, cotton or barley); and (iv)

independent commercial smallholders (Khulisa Management Services 2016).

The policy search for feasible modes of farming in different contexts is supported by further analysis, and comparison within and between the different farm styles on viable, sustainable arrangements for all parties involved. Irrigation is an important factor in shaping the above-mentioned farm modalities, but this has so far received limited attention. The research presented in this report contributes to these debates by providing an in-depth analysis of the Flag Boshielo irrigation scheme, Limpopo Province, South Africa. Irrigation on the riparian strips of the Olifants River, since pre-colonial times, evolved into the large black resettlement scheme in the former homeland of Lebowa, with out-grower arrangements until 1994. Six sub-schemes (or 'farms') became joint ventures from 2001 onwards.

### *Smallholder Irrigation Policy in South Africa*

The post-1994 interactions between South African smallholders and agribusiness are rooted in a long history. The estate mode of large-scale commercial farming in the former white RSA received a century-long, proactive support by the colonial state. Strong support to irrigation resulted in 1,550,000 ha of large-scale irrigated land (DAFF 2015).

In the former homelands, the apartheid state also initiated irrigation schemes. Currently, some 300 schemes can irrigate an estimated total of 50,000 ha, which is 3% of the country's total irrigated area (DAFF 2015). These schemes were operated by the government, or a parastatal, and smallholder out-growers. The dismantling of the apartheid structures in 1994 without immediate alternative structures led to the partial or full collapse of many of these irrigation schemes. By 2010, about 206 schemes were still operational, but 90 schemes (a third of the total of about 300) had stopped irrigating (van Averbeke 2011). On two-thirds of the schemes that were still operational, on average, less than two-thirds of the farm area was cultivated (Denison and Manona 2007).

From the 2000s onwards, the South African government started to revitalize the ailing smallholder irrigation sector in the former homelands, budgeting a total amount of USD 108,688,000[1] over 5 years (2005-2009) (Shaker 2005; Maepa et al. 2014). Limpopo Province, the focus of this report, has the largest areas of former homelands and the country's highest share of smallholder irrigation schemes. Initially, the focus was on participatory approaches targeted at smallholder families. However, in 2004, the focus shifted towards joint ventures; 10 joint ventures were formed in Limpopo Province. Smallholders were expected to benefit from the same assumed threefold advantages of agribusiness. Strategic partners from the large-scale irrigation sector came forward bringing their own capital for inputs (bearing risks), sophisticated implements and technological skills, and their links to input markets and to large-scale farmers' national and export crop production and distribution systems. Smallholders and the government were to provide the rest, including new irrigation infrastructure. Net profits were to be shared between smallholders and the strategic partner.

However, the results of the joint ventures were disappointing (Tapela 2009, 2012, 2016a, 2016b; Denison and Tapela 2009; Nowata 2014). Less than a decade later, five joint ventures had entirely collapsed, land is barren and irrigation equipment is vandalized. One scheme stopped temporarily because of land tenure issues within the community and between the community and the government. By 2017, the other four schemes continued in somewhat different constellations, either being highly dependent on government support or ridden by conflicts within the community and with the strategic partner (Tapela 2009; van Koppen et al. 2017) (see Table 1).

[1] A conversion rate of USD 1 = ZAR 10 is applied throughout the report.

TABLE 1. Operational status of joint ventures in Limpopo Province in 2015.

| Irrigation scheme | Number | Functioning in 2015 |
|---|---|---|
| Mariveni (citrus), Phetwane (in Flag Boshielo) | 2 | Functioning; high government support |
| Makuleke, Strydkraal (in Flag Boshielo) | 2 | Functioning; with conflicts |
| Elandskraal (in Flag Boshielo) | 1 | Not operational; land tenure conflicts |
| Tswelopele, Homu, and in Flag Boshielo: Mogalatsane, Kolekotela and Setlaboswana | 5 | Not operational after conflicts with strategic partner |

The South African government analyzed the failures in both joint ventures and smallholder irrigation schemes, and proposed a different approach. In 2012, immediately after the formal expiry of the first round of joint venture contracts, the draft business plan for revitalization of irrigation schemes by DAFF[2] summarized the lessons learned (DAFF 2012). These details were confirmed in the national Irrigation Strategy of 2015 (DAFF 2015). This strategy evaluated joint ventures in the broader light of food security, poverty alleviation, job creation and skills development as the outcome-based performance framework of the National Development Plan 2030 (National Planning Commission 2010). Accordingly, for any irrigation support, the national Irrigation Strategy emphasizes the importance of the institutional configuration, and stipulates that irrigation interventions must:

- recognize diversity among smallholders;
- plan in a participatory manner with full respect for farmers' preferences;
- promote holistic interventions that consider all aspects (such as markets, finance, inputs, infrastructure, capacity and institution building, and crop production information); and
- avoid that projects primarily focus on infrastructure construction, by allocating two-thirds of the budget to the soft component of human capital development (farmer training, institution building, negotiation skills development, marketing support, mentoring, planning, etc.) and production input costs.

Further, specifically focusing on joint ventures, the Irrigation Strategy states that irrigation projects should:

- stop encouraging joint ventures with strategic partners from the top down, and only accept joint ventures for funding if farmers had contractually and factually been involved as decision makers;
- ensure that the strategic partner should transfer skills; and
- monitor the joint venture's contractual agreements and mediate in conflict resolution.

For implementation of this new, diversified strategy to revitalize irrigation schemes in former homelands, a fourfold increase in the budget was proposed in Limpopo Province. Costs went up to USD 20,000 per hectare. This is very high compared to, for example, the average costs of USD 8,233 per hectare for rehabilitation, as found in an analysis of 314 irrigation schemes in 50 African countries (Inocencio et al. 2007; Malik et al. 2014).

The present study seeks to support the cost-effective implementation of these goals with a focus on joint ventures.

## Goal, Questions and Method

The goal of the present study is to generate evidence about the collaborations between smallholders, the government, agribusiness and irrigation in the historical perspective of

[2] The name of the Department of Agriculture, Forestry and Fisheries has slightly changed since 1994. In this report, we use the name in 2017.

South Africa. This evidence can inform the operationalization of the national Irrigation Strategy of 2015 towards the creation of viable and sustainable joint ventures that contribute to goals of smallholder food security, poverty alleviation, job creation and skills development.

Research questions include:

What were the out-grower arrangements between smallholder irrigation, the state and agribusiness in former homelands, what was the impact, and what changed during and after the transition to the new dispensation after 1994?

How were the joint ventures designed to mobilize the three claimed advantages of agribusiness: capital mobilization, technology and skill transfer, and linking to input and output markets? How were they implemented?

What were smallholders' individual or organized actions and perspectives?

Why did some joint ventures break down while others continued? What were the implications for smallholders?

What lessons can be learned on the future cost-effective operationalization of the national Irrigation Strategy of 2015?

***Method***

The method used to answer these questions is the case study approach, or the 'biography of a scheme', focusing on the Flag Boshielo irrigation scheme. The overall scheme consists of a row of 13 smallholder sub-schemes along the Olifants River on the right bank and one on the left bank. It is one of the oldest irrigation schemes in the northern half of South Africa and has seen a variety of modes of farming since pre-colonial times. It includes six of the 10 joint ventures in Limpopo Province.

The research method is largely qualitative and historical. The study draws on a range of sources. Formal and grey literature, government studies and policy documents were reviewed, but appeared scarce; it is mostly oral history and tradition. From 1999 to 2017, the authors visited the scheme at least four times per year to interview farmers, local extension workers and local managers. In addition, Barbara Tapela conducted in-depth studies on Phetwane and did a rapid appraisal of selected communities in the entire scheme (Tapela 2009). She also conducted in-depth follow-up studies in 2016 in Phetwane and Elandskraal irrigation schemes (Tapela 2016a, 2016b). Everisto Mapedza studied Kolekotela, Mogalatsane and Setlaboswana irrigation schemes in further detail (Mapedza et al. 2016). Barbara van Koppen followed all the schemes, in general, and events in Strydkraal, in particular; MaTshepo Khumbane, grassroots activist, often accompanied her. Strydkraal was also studied by Kamara et al. (2002).

Focused interviews and a continuous policy dialogue were held with provincial and national policy makers and program managers. Various national policy dialogues were held and research presentations made, including a national workshop about joint ventures in 2009 (Denison and Tapela 2009).

## The Flag Boshielo Irrigation Scheme

The Flag Boshielo irrigation scheme in Sekhukhune District, Limpopo Province, is situated some 300 km northeast of Pretoria. The Olifants River provides year-round water to the left and right bank. In 1987, a large multipurpose dam, which releases these flows, was finalized. The potential command area is well over 2,000 ha. The scheme has a long history of changing relationships between the government, smallholders and agribusiness. This study focuses, in particular, on the row of 13 black smallholder sub-schemes (or 'farms') on the right bank, and one farm, Elandskraal, on the left bank, each with adjacent residential areas (see Figure 1).

For this study, the following parts are distinguished:

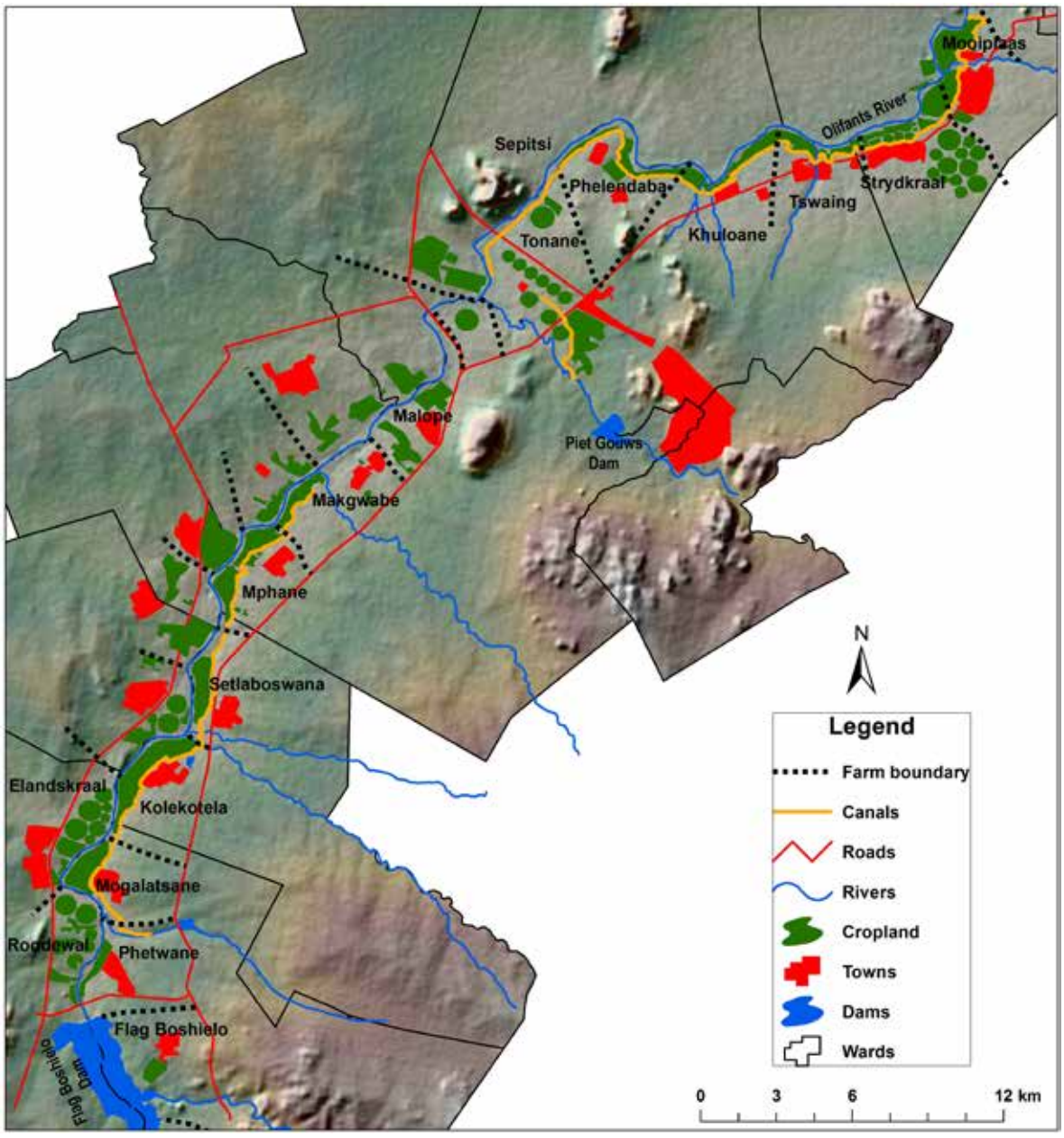
Upstream on the left bank:

Elandskraal, with the first joint venture in 2001, which temporarily stopped later (Tapela 2016a).

Along the right bank:

- The upstream part of four farms with three different chiefs, each with one joint venture: Phetwane (which continues) and Mogalatsane, Kolekotela, and Setlaboswana (which collapsed).
- The middle part of seven farms under one chief, without joint ventures: Mphane, Makgwabe, Malope, Veeplaas (Tonane), Phelendaba, Khuloane and Tswaing. However, Veeplaas (Tonane) has leased its land to a commercial farmer.
- The downstream part of Strydkraal and Mooiplaas, under different chiefs, with a continuing joint venture in a federation of schemes.

FIGURE 1. Irrigable cropland and residential areas of the Flag Boshielo irrigation scheme.




*Source:* Created by Luxon Nhamo, IWMI.

***Analytical Framework: The Accountability Triangle***

The national Irrigation Strategy (DAFF 2015) reflected the Presidency's National Development Plan 2030, which emphasizes people's participation and government's outcome-based performance to achieve food security, poverty alleviation, job creation and skills development (National Planning Commission 2010). The concept of a developmental state for service delivery aligns with the World Bank's concept of public service provision according to the 'accountability triangle' (World Bank 2011). Its basic premise is that more accountability to service receivers improves the service. This triangle maps the three sets of actors and their relationships in service delivery (Figure 2). In this study, they are: (i) citizens, (ii) the state, and (iii) service providers.

**Citizens**

In this case, they are class-, age- and gender-differentiated irrigating smallholders and other inhabitants of the Flag Boshielo irrigation scheme, within their social context of kinship, tribal and other authorities, and other forms of organization and leadership.

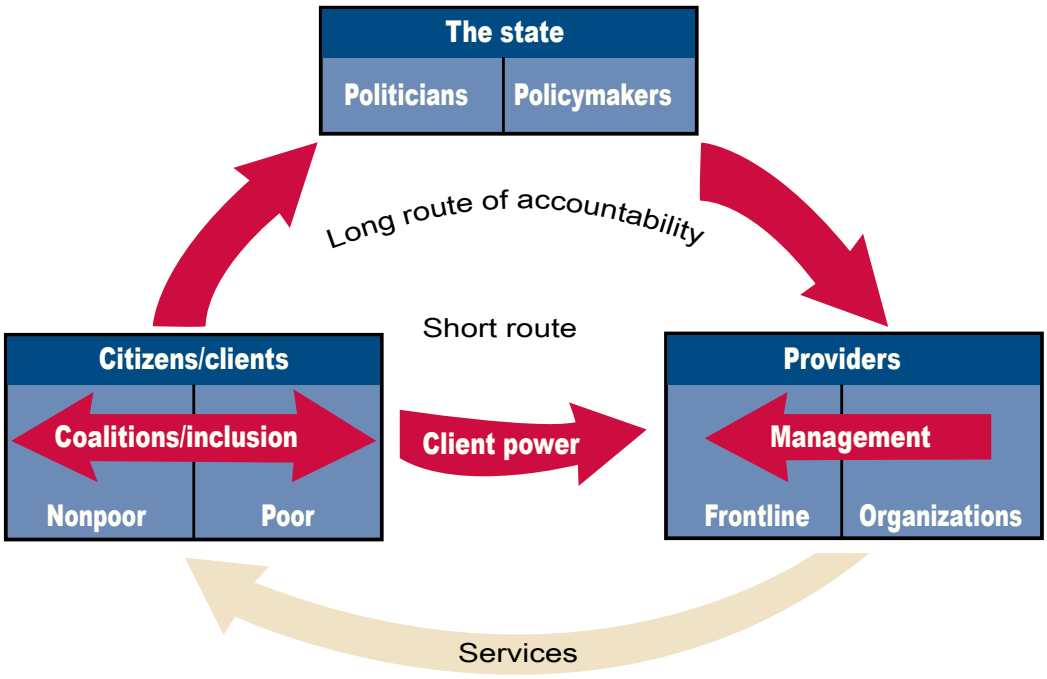
**The state of politicians and policy makers allocating public resources**

In this case, they are, subsequently, the apartheid government, which transitioned in the 1990s to a democratically elected government under presidents Nelson Mandela, Thabo Mbeki and Jacob Zuma (RSA 1996).

**Service providers are either state staff providing services through compacts or private service providers contracted by the government, or a combination of the two**

In this case, service providers are the pre-1994 parastatals and pre- and post-1994 government staff, and private consultants. The latter included the irrigation industry (irrigation equipment manufacturers, irrigation design consultancy firms, and contractors) and – in the case of joint

FIGURE 2. Triangle of service delivery, and key relationships of power and accountability.




*Source:* World Bank 2003.

ventures – the strategic partner with his capital, inputs, management and market linkages. Service providers are upward accountable to the state, either as their superiors or contractual clients.

The mutual relations in this triangle are defined as accountable, if: (i) there is a delegation of, or request for, an expected service; (ii) there are financial or other rewards for delivering that service; (iii) the service is actually delivered; and (iv) the ability exists to enforce the expectation, which supposes that (v) there is sufficient information about the service performance (World Bank 2011).

World Bank (2011) distinguished a long and a short route towards accountability, and hence better services. The base of the triangle in Figure 2 is the short route and the two top sides of the triangle represent the long route to accountability. Although it is underlined that there is no blueprint or panacea, experience across the world suggests that a combination of both routes is most effective.

The short route to accountability is directly between service providers and citizens. In this relationship, citizens' voice is manifest as client power. Client payments for services or other contributions hold service providers accountable. Choice among various service providers and co-production of services in participatory planning also strengthen clients' power.

The long route to accountability has two legs. First, citizens hold their politicians accountable in multi-party states such as South Africa primarily by elections at local, regional and national levels, and also by lobbying, protests and other forms of civil action. In this way, citizens delegate an expectation of service delivery, for which many pay taxes. Second, politicians liaise with the policy makers who allocate public resources that shape the services, and delegate the actual service delivery to government service providers (compacts) and private firms (contract).

This triangle allows unravelling of the relations and actions, and explains different outcomes between the government, the irrigation industry and the strategic partner, and their mutual accountabilities.

***Report Structure***

The report structure is chronological. In the next section, we discuss the pre-1994 history of the then 'Olifants-Sekhukhune irrigation scheme' of farmers' settlement and intervention by parastatals or the apartheid government. The section *Collapse and Responses* analyzes events during the 1990s when the government changed, and explains the collapse of the irrigation scheme and responses by women and men irrigators, other inhabitants, private consultants, the agribusiness (including informal lease arrangements between chiefs and private large-scale farmers) and the new government. While the government started with a *participatory* Revitalization of Smallholder Irrigation Schemes (RESIS), this became 'RESIS Recharge' with an exclusive focus on joint ventures. The section *Implementation of RESIS Recharge*' analyzes the implementation of RESIS Recharge, and identifies how and why some schemes broke down while others continued to irrigate and produce. Responses by those who suffered losses and other inhabitants of the scheme are also discussed. The report ends with lessons and recommendations for the government on how to enable and monitor a strong, short route to accountability between smallholders and the agribusiness, and how to support smallholders in the second leg of the long route to accountability on land tenure and water infrastructure, in order to achieve food security, poverty alleviation and employment generation in South Africa. The recommendations may, potentially, be applied elsewhere.

# Pre-1994: The Olifants/Sekhukhune Irrigation Scheme

## Land Appropriation and Resettlement

This prime riparian land along the Olifants River has been one of the earliest 'land and water grabs' by the Afrikaner Boers, who had left the Cape area in search of more land and access to sea harbors for trade through the northern part of South Africa. Before their arrival in the mid-1800s, the strip was occupied and farmed by the Pedi. The Boers gradually dispossessed the land and the British followed. As elsewhere in the colony, the settlers demarcated large farms and declared these lands under the British title deed system as their own, which was mainly for speculation purposes initially (Lahiff 1999). This 'lawful' encroachment was enforced by the British imperial army, in particular by defeating paramount chief Sekhukhune in 1879 (Delius 1984).

The 'farm' blocks date back to that era: surveyors carved out 14 blocks of land of an area between 50 and 250 ha (called 'farms'). Between 1871 and 1973, individuals with both Afrikaner and English names obtained title deeds. Through sale, inheritance and bankruptcy, all farms changed hands at least once and some as often as five times. Twelve out of 14 farms were transferred to mineral speculation companies. These companies separated the mineral rights, which they retained for themselves. The surface rights were further transferred. By the 1930s, all land (minus the mineral rights) was in private hands. Over time, the Pedi inhabitants of the area were subjugated as tenants or farm laborers on their ancestors' land (Lahiff 1999).

The title deeds also mentioned water levies for irrigation, which were paid to the Middelburg Irrigation Board. The latter was one of the first white Irrigation Boards. By declaring that this part of the Olifants River had to be regulated by the 1926 Water Court normal flow apportionment, the white settlers also 'lawfully' exerted their self-declared rights to the passing waters, dispossessing the Pedi from their prior customary water rights as well (Lahiff 1999). A river abstraction weir, abstraction pump house and earth canals were constructed in 1933.

The Pedi were then resettled on the farms. In 1936, the Native Trust and Land Act was passed. This made provision for the purchase of land in order to extend the so-called Native Reserves. The right bank of the Olifants River was slated for that purpose. The South African Native (later: Development) Trust bought many of the above-mentioned farms between 1938 and 1963. They settled Africans and formalized irrigation in line with the 'Irrigation' chapter (chapter 29) in the Tomlinson Report[3], which referred to: "vibrant irrigation by black people. Some had taken up irrigation on their own initiative and explicitly requested further irrigation support." The Tomlinson Report also highlighted how Pedi farmers in the nearby Nebo District had voluntarily contributed labor to construct 60 earthen dams in collaboration with the agricultural section of the Native Department, and 11,300 bags of wheat were produced (Houghton 1956). In the policy of the Tomlinson Report, the northeastern regions of the Transvaal Province (currently Limpopo and Mpumalanga provinces) were to get most of the 122 irrigation schemes in the Union of South Africa. Within this region, the Olifants River was particularly important: 36 schemes were along the Olifants River. After the apartheid regime had come to power in 1948, it promulgated the Bantu Authorities Act of 1951, the Promotion of Bantu Self-government Act of 1959, and Lebowa's declaration of internal self-government in 1972. The latter consolidated the appointment of a Lebowa government consisting of chiefs reporting to, and implementing orders and investments from, 'Pretoria', the capital of the country.

Initially, the resettlement of black farmers on the purchased Trust Land along the Olifants River met resistance. The Tomlinson Report noted that, initially, "the local population was very

[3] After its election in 1948, the apartheid government appointed a commission, chaired by Tomlinson, to study the economic viability of the 'reserves' (later homelands) and the required investments. Hardly any of the other proposed actions have been implemented.

unwilling to take up irrigation." However, by 1952, "472 plots had been allocated." Other farms were purchased later. A "maintenance rent" of 1.10 pounds per year was charged (Houghton 1956). Each household obtained a plot of usually 1.28 ha (1.5 morgen) plus a house 'with the same number' as the plot in the new settlements. After 1969, all plots of the Pedi were classified as state land, held on the basis of a Permission to Occupy (PTO) according to the Bantu Areas Land Regulations (Proclamation R188 of 1969). This drew its legal authority from the 1936 Native Trust and Land Act (Lahiff 1999) (See Annex for the pre-1994 policies and laws).

This settlement and irrigation development in the Olifants-Sekhukhune scheme served various political and food security goals of the apartheid government, including the following: consolidating the territorial segregation because the above-mentioned purchase of Trust Land rendered this stretch of the river as the boundary between Lebowa and the white RSA; pacifying forcefully removed chiefs and their followers by 'compensating' them with irrigated land; favoring many different smaller allied chiefs to break organized resistance, especially by Chief Sekhukhune and his followers, who were a stronghold of the upcoming African National Congress; pacifying male plot holders by giving them all resource rights and more power over their wives; pacifying all settlers in the scheme through food security (by the late 1980s, only 30% of the food consumed in the homelands was produced internally; the large majority of black people already depended on the purchase of food produced by white farmers); providing employment to white irrigation engineers and managers; and in the course of the years, ensuring full white control over mechanized technology, including irrigation infrastructure. There has never been any ambition to initiate 'economically viable' irrigation. The settlement on the farms at the right bank, from upstream to downstream, reflects these goals as follows.

The extent of forced removals to enforce territorial segregation, of contested land claims, scattered chieftaincies, and the resulting lack of effective farmers' organization up to this day, is reflected in the settlement history. The two most upstream farms – Hindoestan (later Phetwane) and Coetzeesdraai (later Mogalatsane) – were allocated to Frank Sikoane Matlala Maseremule. This chief, together with his followers from the Ba-Kone tribe, was first removed from Pietersburg, and settled in and around Jane Furse (in Sekhukhune land). He had no strong bonds with Chief Sekhukhune and was one of the first chiefs to accept Pretoria's offer of a position in the newly declared Lebowa homeland government. His son Mokgome M. Matlala became minister in the homeland department of home affairs, instilling strong tribal-based authority, which continues up to this day. These chiefs allocated the plots of the two farms in perpetuity to men. After 1994, a land claim for this farm was lodged by a community that resided in Leeuwfontein (near Marble Hall). Their grandparents were called 'petwane'. According to the claim, they had lost this land in 1958 for "reasons of ethnicity" to the people of Matlala (Lahiff 1999; Claassens 2001; Tapela 2009).

In 1962, the farm Krokodilheuvel (later Kolekotela) was occupied by members of the Mampana community. They previously lived on white farms scattered in Sekhukhune and were brought together on this farm (Lahiff 1999).

The next eight downstream farms, from Struisvogelkoppie (later Setlaboswana) to Haakdoringsdraai (Tswaing), are followers of Chief Masemola, the original resident chief in this area who reported to paramount Chief Sekhukhune. The eight Masemola farms are Struisvogelkoppie (later Setlaboswana; the only farm that became a joint venture later), Gaataan (Mphane), De Paarl (Makgwabe), Nooitgezien (Malope), Veeplaas (Tonane), Wonderboom (Phelendaba), Vlakplaas (Khuloane) and Haakdoorndraai (Tswaing). Family members had also been scattered on various white farms, but they were eventually consolidated. The central area, Veeplaas ('place of cattle', and later Tonane), only got irrigation infrastructure in 1983.

The two farms furthest downstream experienced the most troubling relocation of Chief Masha and his followers to Strydkraal, while prior inhabitants used the farm Mooiplaas.

In the 1950s, Chief Masha and his followers were forcefully removed from Kalkfontein, near Lydenburgh in current Mpumalanga. Pretoria gave Chief Masha and some of his followers these farms as a form of economic and moral compensation. Chief Masha obtained a relatively important position in the Lebowa government. He interacted actively with the Lebowa Department of Agriculture and white engineering firms, which gave him the reputation of an entrepreneurial and progressive chief. In 1987, the government gave a center pivot to 'the community' (a center pivot is a method of circle irrigation, in which equipment with sprinklers rotates around a pivot). However, as a community member narrated in an interview, "it appeared difficult for the community to manage, so Chief Masha took the management over." The chief, at his turn, leased the operation out to the first strategic partner in the Flag Boshielo irrigation scheme. This was a white farmer (Farmer B) from Marble Hall, which is the nearest white town situated some 40 km away. There was a direct contract between the two, which was to last up to 2007. Other community members in Strydkraal did not like Farmer B. As one mentioned in an interview, "He was shooting at our animals even if they were far, and without warning."

However, the Nchabeleng and Ga-Nkoane communities of Apel further downstream lived in the same area and cultivated the farm of Mooiplaas. They felt that Chief Masha and his people were forced upon them without consultation, and deprived them of part of their land in the irrigation scheme. This compounded increasing political contest between Nchabelengs' anti-apartheid movement and the Masha community. The struggle became violent and led to the abandonment of most of the Mooiplaas scheme.

Lastly, the most recent removals concerned the people settling on the Trust farm Elandskraal. This farm is on the left bank, opposite Mogalatsane (see Figure 1). These inhabitants were settled in the 1980s after removal from Moutse in the former Kwa'Ndbele homeland (Tapela 2009).

## Centralizing Water Infrastructure and Managerial Control

Government control over water for irrigated production and white irrigation professionals' state and parastatal employment and expertise increased. As elsewhere in South Africa's homeland irrigation, the water infrastructure was mostly flood irrigation until the 1970s. Also triggered by floods in the 1950s, the apartheid government started improving the water provision. In the 1960s, it finished the construction of the – still existing today – concrete canals, and the Makotswane, Lepellane, Nkadimene and Piet Gouws dams. The latter was also used to provide water for domestic use in Chief Masemola's village. Further, in the upstream farms, pumps were installed to lift water out of the river. In the middle of the scheme, near Veeplaas, a weir was constructed in the Olifants River to feed a gravity canal that conveys water to the fields of the downstream farms, which also still happens today.

Water allocation became better controlled as well. After the 1956 Water Act, the riparian stretches along the entire Olifants River became Government Water Control Areas. New Irrigation Districts were formed to control water abstraction. The most upstream stretch, including both farms of Chief Matlala, and farms on the left bank became part of the Olifants Irrigation District (proclaimed in 1968). Farms further downstream along the right bank of the Olifants River became the Sekhukhuneland Irrigation District, proclaimed in 1969. Interestingly, in 1980, an agreement about the water apportionment was arranged between the 'co-basin states' of the white RSA and the entire self-governing homeland of Lebowa. Acknowledging Lebowa's 'rightful claim to the water' of the river that crossed their area, a proportion of precisely 52.65% of water was allocated during critical months. However, since the allocation was a share, it was added that, because of water variability in the large upstream Loskop Dam, "the allocation to Lebowa and the other consumers downstream of the Loskop Dam also had to be determined from season to season' (Department of Water Affairs 1991a).

Again, in line with irrigation developments elsewhere in the country from 1980 onwards (van Averbeke et al. 2011), the apartheid government in Pretoria subsidized white development corporations and the white engineering firms to step up their efforts in the homelands in a next round of investments. They upgraded the schemes to more expensive, energy consuming and more centralized technologies. These were "excessively capital intensive, based on the most sophisticated modern technologies" (Laker 2004). There was a reason for this:

> "Since consultants always received a fee based on a percentage of the capital expenditure, it was to their advantage to plan the most capital expensive system. The South African government funded only capital expenditures and not running costs and it was thus easy to convince homeland governments to go for capital intensive projects, rather than those with higher running costs, e.g., labour intensive ones" (Laker 2004).

This was the start of the trend in which "design solutions appear to have been scaled down versions of first world technology rather than finding a solution that would work well for smallholder farmers" (Machethe et al. 2004).

As an extension worker remembered, with great zeal and efficiency, technologies were developed in the Olifants scheme. Within just 3 years, new equipment and electricity were installed by 1983. Pumping from the canals or river gave pressure to piped side-roll sprinklers and center pivots (which required centralized control). These upgrades also included the central grazing area of the Masemola community, Veeplaas, implicitly seeking to pacify Chief Sekhukhune as well. The Veeplaas farm became a sprinkler irrigation scheme with 28 plots of 2.5 ha (out of which five were allocated to women) and two plots of 10 ha (allocated to relatives of Chief Masemola) (Lahiff 1999). Thus, the total area on the right bank from upstream Hindustan (Phetwane) to downstream Mooiplaas became 1,873 ha. Piped sprinkler covered 71% of the irrigated area, center pivot covered 10% and 19% was under flood irrigation (Small and Stimie 1999).

In 1987, the Government of Lebowa completed the construction of a large dam just upstream of Phetwane and Elandskraal. This was called the Arabie Dam[4]. The name of the irrigation scheme also changed to Arabie scheme. A short-term purpose of the scheme was to provide water for domestic use for communities downstream and also for irrigation. Further, the available surface water from the Arabie Dam for irrigation was set at 2,767 ha. However, the medium-term consideration was to provide municipal water to the province's capital of Polokwane 100 km away; as well as water provision to mines further downstream in Limpopo and Mpumalanga provinces and in the adjacent North-West Province in the western direction (Department of Water Affairs 1991b). Moreover, the dam allowed for better regulated downstream dry-season flows and flood mitigation (nevertheless, severe floods in the 2000s still caused major damage to the irrigation schemes). The new dam inundated 1,288 ha. An estimated 200 people have been displaced without compensation. Some of them raised this issue and lodged a land claim in 2012, when the plans for nature conservation for tourism were discussed (Tapela 2009).

## State-subsidized Out-grower Arrangements

The management of input provision, marketing facilities and water technologies such as pumps and sprinklers was centralized. This was provided either by irrigation engineers contracted by the government as parastatals or employed as government staff. Between 1983 and 1988, the greater part of the scheme was managed by the Agriculture Management Services (AMS) on behalf of the Lebowa government. The remainder

[4] While some authors (e.g., Department of Water Affairs 1991b) refer to this dam as the Mokgoma Matlala (M.M. Matlala) Dam, others give that name to the Piet Gouws Dam.

was managed by the Lebowa Department of Agriculture and Environmental Conservation itself. From 1989 to 1992, another company already in existence, the Lebowa Agricultural Corporation (LAC), took over from AMS. In 1996, with the consolidation of the nine new provinces in the new South Africa that had gained independence in 1994, the greater part of the scheme came under the management of the Agricultural and Rural Development Corporation (ARDC). This was a merger of various development corporations in three former homelands in the north (Matlala and Shaker 2003). ARDC, receiving USD 7 million per year from the treasury, employed a staff of 1,200 and had a salary bill alone of USD 2.2 million. It cultivated and provided services for 120,000 ha of government land (Shah et al. 2002). Service costs were paid by government subsidies and by service charges to farmers.

In 1993, the ownership of the irrigated plots was transferred from the South Africa Native Trust to the Government of Lebowa, with the exception of two schemes that were bought by the Masemola Tribe and two farms that remained with the South African Development Trust (Lahiff 1999).

The centralized managers were white and they employed black staff. The Arabie scheme had five extension workers. One of them recalled in the interview: “I was always there as the black man with the white man, to mediate and explain. For example, black cultivators were numbers. Sometimes people who had worked hard and had harvested well, got less income. I was then the one to check, so I found out that the numbers had been mixed up.”

The central management dictated from the top down: the crop to be sown, which was alternately wheat and maize, sometimes cotton, but hardly ever high-value vegetables, although farmers were quite interested (Maloa and Nkosi 1993); dates of ploughing and other operations; provision of paid mechanized ploughing services; fertilizers and chemicals to be used; day and hours when the sprinkler pipes had to be moved; days for harvesting and central collection of the produce; and payment days. The management insisted on collecting all produce and discouraged any local trade (though it still occurred). They brought the harvest to the Oos Transvaal Kooperasie – East Transvaal Cooperative (OTK) or Nord Transvaal Kooperasie – North Transvaal Cooperative (NTK), which calculated the income. Costs for cultivation were subtracted from the total income gained to pay the net incomes. Indeed, farmers were no more than laborers on their own plots, bearing the risks of this high-input, expensive and high-risk form of farming (Shah et al. 2002). A farmer compared his situation before with the later dependency on central AMS managers and high production costs to be paid at harvest: “Though we produced little before they came, we owed nobody” (Maloa and Nkosi 1993).

## Gendered Divide and Rule

Apartheid policies of territorial segregation and ultra-exploited migrant labor were strongly gendered. Irrigation policies added an ironic twist. By the 1960s, the Pedi agrarian economy was specialized along gender lines, which created mutual dependency (Monnich 1967). Few activities such as gathering were carried out by everybody. Warfare, hunting, cattle, sheep and goats (but not pigs and fowls) were men’s domain. It included the herding, milking, slaughtering and washing of milking utensils. It was often a taboo for women to engage in this domain. Men were also responsible for keeping the cattle out of the crop fields.

Women, on the other hand, were responsible for domestic chores, including fetching of water for domestic use and wood. Other water-dependent activities, such as brewing of beer and cleaning and repairing huts and courtyards, were also women’s domain. Men were responsible for building and thatching of houses, while women made the floors, walls and the decorations. Pottery was often a woman’s task. Gender patterns for reeds work varied. Men did woodwork, and work in hides and leather.

Crop cultivation was women’s domain, with the use of the iron hoe. Women decided on the cultivation of crops such as sorghum, millets, pumpkins, watermelons, calabashes, beans, yams and types of tobacco. There was no taboo

for men to participate in cultivation. Men shared responsibility in land clearing, in particular. Girls assisted their mothers, and both boys and girls assisted in bird scaring. This was a burdensome task for sorghum and millet, but was not needed for maize. The cultivation of vegetable gardens could be carried out by men or women or both. Rights over land were with the husband's kin. The mother-in-law allocated land to their sons' wives. The importance of the mother-in-law is illustrated by the name of the 'moon which bursts', coinciding with October's spring time. This moon was called "the strict mother-in-law," who kept her daughters-in-law occupied with agricultural activities from the ploughing season until the end of the harvest. Sizes of farms depended mostly upon the capability to cultivate. Among the Pedi, this was 2 to 6 acres (0.81 to 2.43 ha) (Monnich 1967).

The apartheid government distorted this gendered mode of production and separated families to serve the white minority economy. Under the notorious betterment programs in the homelands, men's livestock was massively culled (Bundy 1988). This contributed to men's labor migration at extremely low individual wages and their living in harsh temporary hostels. Women's crop production became the unpaid mainstay for the reproduction of the labor force: raising children, and taking care of the sick and returning pensioners.

Paradoxically, the apartheid irrigation developers introduced the European notion of the nuclear family, solely engaged in irrigated farming, with the male household head as the 'natural', sole household member entitled to land, technologies and other productive resources, including the fruits of their wives' labor. Thus, the Tomlinson Commission recommended a size of 1 or 1.5 morgen (1.28 ha) because:

> "Out of the various farming and settlement systems, irrigated farming is undoubtedly the enterprise for which the Bantu has proven that they are able, under white management and leadership, to make an economic living out of full-time farming and to use the land economically for food production. Unlike rainfed agriculture, the man does not avoid activities here – the man and his whole family are active on the plots" (Houghton 1956).

The Tomlinson Commission explained that a size of 1.5 morgen would allow a nuclear family to cultivate full time. As studies from the Olifants River scheme had shown, a gross income of 110 pounds could be derived from 1.5 morgen (1.28 ha). This was seen as enough income for a reasonable livelihood – according to white perceptions of Bantu standards of 'viability'. While these 1.28 ha plots were allocated to men as 'heads of households', only smaller gardens of one sixteenth of the size of irrigation plots were to be given to 'widows' (Houghton 1956).

The Commission also gave strict instructions stating that all those who got plots should give up other farming and work full time on the irrigation plots. Plot holders were not allowed to leave their homes for more than 14 days without written permission from the (white) scheme manager. Also, no other families were allowed in the dwellings of the irrigating households without permission from the manager (Houghton 1956).

These new relative privileges for men over their wives served a further goal, as also echoed in magazines such as the 'Bantu'. Commenting on how native men often went for migrant labor, while women continued cultivation, they stated that irrigation was the best way to raise men's interest in cultivation, so that they would stop migrating (The Bantu 1970). Thus, men were co-opted to join elite irrigation at the expense of women by further reinforcing men's resource rights and powers over the labor of their wives. Thus, in the same way in which irrigation technologies became 'scaled down versions of first world technologies' (Machethe et al. 2004), the white managers continued the divide and rule by scaling down white family norms with men as household heads solely entitled to new irrigation land and other resources *and* new powers over the fruits of the labor of their female kin.

In reality, the 'widows' supposed to receive at best one sixteenth of men's plots may well have

included married women. Even stronger, by 1994, the majority of irrigating cultivators in the Olifants River scheme and all other government-supported smallholder irrigation schemes in the Olifants Basin were – and still are – women. Percentages vary from 70 to 90% or more (Van Koppen 2002). In the Olifants irrigation scheme, between 20 and 40% of the official PTOs were even in women's names by 1999, although the law prescribed that only men could obtain PTOs. This reflected women's continued role in cultivation and their land inheritance after the death of their husbands. In Veeplaas, the proportion of women was 40%. Their (female) Chief Masemola explained in an interview how conflicts tend to arise when men claim part of the harvest on the basis of land claims without contributing to the work. Her late father considered that unfair. Moreover, women came to cash the cheques from the marketing cooperatives. It was often confusing when cheques in their husbands' names were cashed (van Koppen and de Lange 1999). Expectedly, in the Pedi culture, women were generally more productive than men, and even more if they held the plot in their names. This is what Kamara et al. (2002) found in the mid and late 1990s, the last cropping seasons before the apartheid state structures were dismantled.

## Food Security and Local Water Development

Last but not least, irrigation brought food security. By the early 1990s, women and men plot holders in the irrigated farms of the Arabie/Olifants River irrigation scheme were generally content with food for household consumption, especially maize, and for income from surplus sales of wheat or sometimes cotton. Strictly organized and appreciating the benefits, they effectively arranged communal works such as canal maintenance or the moving of the sprinkler pipes when the big bell was rung. However, these satisfied subjects of satisfied chiefs were a tiny minority of the Lebowa homeland.

Although the irrigation canals were designed for irrigation only, they served many other purposes as well, also for the growing number of inhabitants without plots. People used the water in the canals, dams, river and wetlands for cropping, horticulture, domestic use, livestock, fisheries, brick making and other uses. The few boreholes installed by the government in some residential areas were often insufficient to meet even domestic needs. Homestead wells and boreholes also served livestock and gardening. Irrigated gardens were set up, both formally by the government and various nongovernmental organizations (NGOs) and informally by women's groups and individuals tapping water from the canals or river. The small communal garden plots were mainly or exclusively in women's names. For example, the gardens set up by the Rural Women's Association in Apel served some 300 women on 30 ha (Pardeller et al. 1999). With expanding populations and the collapse of most irrigation activities, these informal water uses increased.

In sum, the three sets of actors in the accountability triangle collaborated. Irrigators in the Flag Boshielo irrigation scheme were a relatively privileged minority compared to the rapidly expanding number of other inhabitants of the area. They produced and were food secure. However, men and certainly women smallholders were no more than laborers on their state-owned plots. They had hardly any power vis-à-vis the apartheid government and the parastatal or government service providers that gained employment. The latter controlled all cultivation from the top down and with increasingly mechanized technologies: access to inputs, water and markets. The state achieved its goals of territorial segregation by compensating forcefully removed chiefs with some political prestige, and their male followers with land rights at the expense of their female kin and prior inhabitants.

## Collapse and Responses

### 1990s: Collapse

The dismantling of the apartheid state exposed smallholder irrigators' strong dependency on that government with far-reaching consequences. Already from 1989 onwards, the apartheid government's investments to finance the white-dominated irrigation management agencies began to dwindle. Government budgets reduced by more than 40% (Maloa and Nkosi 1993). By 1993, the incoming government started to see the (white) publicly funded agencies as expensive and inefficient (Maloa and Nkosi 1993). Once the new African National Congress (ANC) government came to power, the political will to keep funding these 'apartheid structures' was even less. The new government decided to drastically reduce the funding of the ARDC, from USD 7 to 2 million (Matlala and Shaker 2003).

Hence, from the winter wheat crop of 1996 onwards, farmers had to take over all production costs, starting with the payment of electricity bills. However, capital for the purchase of inputs was lacking, and it appeared impossible for the isolated farmers to organize in groups to arrange such collective action from scratch. Some traditional leaders tried to keep filling that void, but with less support from the ANC government than from the apartheid government. Still awaiting the demarcation of local government boundaries by 2000, the interim Transitional Local Councils hardly had any power. Moreover, tribal authorities contested these entirely new local government structures. The division of the entire irrigation scheme over four new municipalities was yet another obstacle to scheme-wide organization[5].

A downward spiral kicked in. Pumps broke down and were not repaired. Canals were not cleared anymore. Lack of income from one crop prohibited the purchase of the costly inputs for the next crop. By 1999, only 30% of the scheme was cultivated (Small and Stimie 1999). The bad news on the ground was accompanied by a strong recourse to a neoliberal discourse of 'standing on one's own feet' and own payment for all inputs, which would soon include water. One farmer commented: "It is okay for us to stand on our own feet, but this has been too sudden."

Various responses emerged side by side. As elaborated below, some plot holders, especially women, continued irrigated cultivation. Other inhabitants expanded informal irrigation. Agribusiness arranged private deals with tribal authorities and also engaged with some farmers. All others immediately lost out, and the most marginalized, especially elder women plot holders, lost the most.

### Responses by Plot Holders and Inhabitants

Where possible, plot holders tried hard to take irrigated cultivation forward on their own. This happened mainly with the non-mechanized gravity irrigation. In the Phelendaba (Wonderboom) farm, for example, interviewers learned that individual farmers or small groups, mainly women but often led by men, tried their best to establish direct relationships with the Land Bank for loans (but they were too small to be considered) and direct contacts with the cooperatives for sale (which failed).

Along the canals, women, in particular, started or continued informal gardens, whether the existing or self-made offtakes were seen as illegal or not. Saving groups also emerged, especially among food plot holders with small farm sizes of 0.12 ha (Machethe et al. 2004).

Some younger men tried to form a union, defending the resource rights of their illiterate mothers and fathers. However, they were ignored. The National African Farmers' Union failed to engage. There was some discussion about the

[5] The boundaries of the new municipalities largely follow those of the chieftaincies. Elandskraal and Phetwane are in Greater Marble Hall/Elias Motsoaledi municipality; Mogalatsane farm is in Ephraim Mogale; the farms from Kolekotela to Tswaing in Makhudu Thamaga, and Strydkraal and Mooiplaas in Fetakgomo local municipality. They all fall within the Greater Sekhukhune District Municipality.

option of transferring ownership of both land and irrigation equipment, for example, initiated by the two larger farmers in the Veeplaas farm and some other farmers. Community Property Associations could have been formed to that end. This was the institutional form that was proposed for land reform elsewhere in South Africa. These associations could have been aligned to the formation of multi-tier Water User Associations (WUAs). However, this option was not pursued further, partly because of the risk that chiefs would dominate the process (van Koppen and de Lange 1999).

The only continuity was in Strydkraal, where Chief Masha and Farmer B continued operating the center pivot and cultivating cotton.

## Agribusiness: Cotton out-grower Schemes

Agribusiness stepped in. In two farms, agribusiness attempted cotton out-grower arrangements with all plot holders: in the Veeplaas and Phetwane farms. Both efforts failed. Highly mechanized cotton cultivation is high risk: inputs are costly, so profitability mainly depends on very high production. Any glitch in the production process would lead to net losses (Shah et al. 2002; Tapela 2009).

The first initiative was undertaken by LONRHO in Veeplaas in 1998 and 1999. However, interviewees complained about logistic delays in the provision of inputs and fertilizers, which rendered the production for most farmers, except the most diligent ones, too low to accrue any net benefits. As risks bearers, farmers wanted to return to the cultivation of maize for their food security. LONRHO left, also because of low profitability and internal strategic changes.

While the central buildings in Veeplaas were taken over from the ARDC by members of the Masemola chieftaincy, the land and the irrigation equipment remained idle. Farmer B, who already operated the center pivot with Chief Masha in Strydkraal, stepped into that void. He asked Chief Masemola to lease the land to him. Without much transparency within the tribal council, she agreed. Plot holders were said to have received some USD 20-30 per plot as rent, a very low value for this prime land and free infrastructure (from interviews with an extension worker). Since then, Farmer B has been cultivating various crops. The Provincial Department of Agriculture protested against these private arrangements about state land and equipment, and started a court case against Farmer B which was never concluded (interview with provincial official).

The other case was in Phetwane and supported by the Limpopo Department of Agriculture and Rural Development (LDARD)[6]: cotton growing with the Nordelike Sentrale Katoen (NSK) (North Central Cotton). The LDARD rehabilitated the scheme in 2002. Plot holders became out-growers for NSK in 2003 and 2004, with a profit sharing arrangement. However, as in Veeplaas, NSK was late in delivering fertilizers, so planting dates were delayed. Moreover, the dam provisioning water ran dry, while wages were high. This contributed to severe losses for most in spite of hard work. Pensions had to be used to pay laborers. They also forfeited their maize as a food security buffer. Farmers were deeply disappointed (Tapela 2009, 2016b).

## Early 2000s: Government's Revitalization of Smallholder Irrigation Schemes

The piloting of out-grower arrangements with NSK in Phetwane was one of the government's efforts across the province by the LDARD to design a participatory strategy to re-establish irrigation (Shaker 2005). From 1998 onwards, participatory planning to revitalize irrigation with self-chosen crops was piloted in three irrigation schemes, followed by a first and second phase of a Land Care project. By 2004, it had extended to 28 irrigation schemes, including farms in the Flag Boshielo irrigation scheme. Although the political

[6] The initial name was Northern Province Department of Agriculture, Land and Environment. This changed to Limpopo Department of Agriculture, and later into Limpopo Department of Agriculture and Rural Development, which is the name used in this report.

context of South Africa with its dismantled state and transformation to a newly configured state was unique, some references were made to 'irrigation management transfer'. This placed this policy change in the global trend of the time of irrigation management transfer and participatory irrigation management. However, the name soon became 'Revitalization of Smallholder Irrigation Schemes' (RESIS).

As mentioned, RESIS envisaged spending a total amount of USD 108,688,000 over 5 years (2005-2009). During this period, the plan was to revitalize 126 schemes, including the Flag Boshielo irrigation scheme. The total area envisaged was about 19,730 ha and directly involved 12,432 farmers[7]. The replacement value of the infrastructure was estimated at USD 400 million; this infrastructure was "mostly dilapidated, moribund and non-productive" (Shaker 2005). RESIS aimed at rebuilding and socially uplifting a profitable agribusiness through a "comprehensive programme to structure, train and capacitate smallholder farmers to run their scheme profitably and sustainably" (DAFF 2015). An integrated and participatory process-oriented approach was adopted, with extensive investments in human capital, besides investing in the upgrading of infrastructure. RESIS envisaged a flexible response to a wider range of community priorities, including homestead food production. It considered multiple uses of water, livestock and scheme interrelationships, and dryland crop production (Denison and Manona 2011).

RESIS paid less attention to land tenure issues and ownership of the infrastructure. Machethe et al. (2004) also commented that RESIS paid limited attention to the much needed reform of the input, mechanization, extension and marketing support structures. The same authors also found that "access to information about appropriate technology remains a major problem."

However, by the end of 2004, the new leadership of the LDARD radically abandoned this approach, changing the name to 'RESIS Recharge'. As discussed next, this built on another initiative by agribusiness in Elandskraal. In RESIS Recharge, the government took control of land and water technologies and transferred all production out of farmers' hands to a strategic partner, while leaving farmers with substantive risks. Thus, RESIS Recharge became an engineering centered reconstruction of dilapidated infrastructure, focusing on investments in bulk water supply and in-field irrigation infrastructure (Denison and Manona 2007). It introduced a new configuration of the triangle of the government, farmers and service providers, in which the strategic partner obtained a confusing role of service provider or agribusiness or both.

## Mid-2000s: RESIS Recharge

### *Elandskraal*

RESIS Recharge was inspired by another initiative: the Elandskraal Balima Irrigation Scheme (EBIS) Trust. Elandskraal lies on the left bank of the Olifants River opposite Mogalatsane (see Figure 1). It is a Trust Land farm, in which a total of 223 smallholders lease land from the LDARD and form the umbrella Elandskraal Balemi Irrigation Scheme Cooperative. From 2000 onwards, the national Department of Public Works, in collaboration with the LDARD, and in partnership with the 'Elandskraal Community Production Center', upgraded 150 ha with center pivots (Sigcau 2002). President Mbeki visited the scheme in 2001 in the long route to accountability.

Already in 2001, some of the Elandskraal farmers had initiated a joint venture with a large-scale farmer who traded as a private company,

[7] The Department of Agriculture also protected the well-defined water rights of the smallholders in the ever-growing competition over water. In this case, various mines, organized in the Lebalelo WUA, wanted to take water out of the Olifants River downstream of the irrigation farms to pipe the water to mines. The WUA asked the Department of Agriculture and the Department of Water to lease the water rights of the smallholders for 5 years. The mines also committed to raise the Arabie Dam by 5 m at their own cost by 2006. This would ensure more water for mining in the wide surroundings. In return for the five-year lease, the mines committed to finance an irrigation canal directly from the dam to the fields downstream. Implementation of the canal by consultants was mediocre and it has never been used. None of the farmers were included in these negotiations (interview with provincial official).

AWC (Tapela 2009). In 2005, 18 farmers with 5 to 10 ha plots organized themselves as the Elandskraal Balemi Irrigation Scheme Trust (EBIS-Trust) on the 150 ha of irrigable land, and signed a bilateral contract with this strategic partner. In this contract, the strategic partner committed to use his skills for mechanized irrigated production and to use his access to capital, input suppliers and marketing channels for the entire cultivation and marketing process. He would decide about the production process in consultation with the cooperative. The contract also committed him to build the commercial and technical capacity of the farmers. In return, he would receive 70% of the net income in the first year, 60% in the second year and 50% in later years, leaving the remaining amount, or the risk of losses, with the cooperative. The contract was silent on how the remainder of the harvest should be allocated (Tapela 2009).

In the contract, farmers, on the other hand, committed to consolidate their plots into one pooled farm as required for the centralized center pivots, and to vacate the land to the strategic partner. They also agreed to organize into a collective and manage all intra-group matters. The contract further stipulated the obligation to provide any labor, as far as that was still needed in this capital-intensive and labor-saving mode of production. The duration of this contract between AWC and the EBIS-Trust was 10 years (Tapela 2009). This was essentially a bilateral sharecropping arrangement between plot holders and cultivator, with specific mutually agreed conditions, in a clear and effective short route to accountability. The government's role was limited to the prior investments in the irrigation equipment. Its role in the accountability triangle was enabling only, although the government maintained the power of leasing out the Trust land[8]. The joint venture faced major community-level organizational issues, including land issues within the community and between community members and outsiders. Later, land issues led to a temporary stop, in which task teams were formed that were seen as legitimate by all parties involved, to solve (Tapela 2016a).

### *The Contract in RESIS Recharge*

The new leadership of LDARD decided to do away with the participatory design of RESIS immediately and replace this by RESIS Recharge as the exclusive option for other schemes in Flag Boshielo irrigation scheme and elsewhere. Most schemes were to be managed by the same strategic partner as in Elandskraal: AWC.

Bringing agribusiness on board seemed to fill the gap that was left when the pre-1994 managerial structures were dismantled. It resonated well with a strong discourse in South Africa and elsewhere at the time about the above-mentioned advantages of agribusiness. In the past, substantive state subsidies were needed for the agricultural management parastatals, and companies that handled all forward and backward linkages, managed production with the out-growers, absorbed the government's production risks and somewhat cushioned farmers' risks, for example, through lenient credit arrangements. In RESIS Recharge, all cultivation was outsourced to the one single skilled large-scale farmer, AWC. He had good contacts in the input and produce markets of South Africa's agribusiness; he owned sophisticated labor-saving technologies; and had capital to pay for inputs without needing a loan.

However, as analyzed by Tapela (2009), there were essential differences between the largely bilateral contract of mutual accountability between the strategic partner and the Elandskraal farmers, on the one hand, and the tripartite contract between the LDARD, the strategic partner and the farmers' cooperatives in the subsequent joint ventures, on the other hand, as explained below.

The farmer cooperatives had to give up their land and existing water infrastructure, but had no other role than waiting for their share, which was set at 50%, of the net profits that the strategic partner was contractually obliged to give. There was no further accountability to them, for

[8] Later, these land leases became fraught with capture and conflicts. These became the main reason why the Elandskraal joint venture also halted (Tapela 2016a).

example, on how the net profits were calculated. The contract also committed that the farmers would provide unskilled labor at the request of the strategic partner. Thus, contractually, smallholders could only sit and wait for money as "armchair farmers" or "glorified laborers" (Tapela 2009).

The only other commitment by the strategic partner vis-à-vis the farmers was that he should train them in the areas of finance, quality control, marketing and management, and operational, technical and business operations. This ignores agronomic training about crop varieties or crop water requirements, and misses any sustainable new access to input and capital suppliers, and output markets. So, the farmers would be trained as business clerks instead of competitive producers. Anyhow, the contract remained silent about 'how' and about any monitoring of compliance, let alone dealing with non-compliance. Thus, contractually, the strategic partner could 'get away' without capacity building and transfer of skills or technologies. Even better for the strategic partner, he could always refer any complaints of the cooperative to the LDARD.

In the RESIS Recharge contracts, the LDARD included itself on behalf of the smallholder cooperative. In the contract, the address of the cooperative was the address of LDARD. However, there is no downward accountability stipulated. Even though the contract mentions 'a board' of all three parties, the cooperative had nowhere to go in case of conflicts with one of the other parties, or with both.

Remarkably, the contract was silent about the role of the LDARD in land and water rights, and infrastructure provision. Formally, land in irrigation schemes is state land. In this case, the LDARD silently endorsed the contractual obligation of the farmer cooperative to hand over land to the strategic partner. More significantly, the government installed expensive new irrigation infrastructure, but this was not mentioned in the contract. This infrastructure was an internal arrangement within the government. Within the government, accountability is upward from the provincial department leadership to state officials and treasury. The ability to plan for lots of funds and visibly spend can even be seen as well performing[9]. The issue of outcomes can be relegated to the future (such outcome-based service delivery was strongly emphasized in the later National Development Plan 2030)[10].

In this space, the former state – white irrigation industry constellation – was revitalized into a more racially mixed one. LDARD unilaterally decided to rehabilitate all joint ventures with an expensive and new 'floppy' technology. This consisted of elevated pipes stretched out over the entire field with many turning sprinklers ('floppies'). A single provider in Nelspruit had just started to promote this. The monopoly position of this provider implied that there was no need to tender among a range of competing irrigation equipment manufacturers, as would have been the case for the common center pivots. The consultancy firm that had worked in the Flag Boshielo irrigation scheme during the apartheid era was commissioned to create the irrigation designs.

Significantly, the strategic partner was initially not keen to work with this experimental technology. After several years of gaining experience with floppies, both the strategic partner and the LDARD reverted to center pivots in the most recent joint venture in Strydkraal. However, when the joint ventures started, AWC was "one of the three persons in South Africa who knows how to operate a floppy system" (Sithole 2011). Nevertheless, in spite of this reluctance, the deal was sufficiently attractive for the strategic partner: free provision of land and irrigation infrastructure that allowed full, centralized control over its operation – as floppies do, plus half of the net profits, without any accountability to anyone on how those profits were calculated.

[9] An example of reporting on performance to parliament that entirely focuses on spending patterns rather than outcomes is on the parliamentary monitoring group's website (https://pmg.org.za/committee-meeting/8720/ - accessed May 15, 2017).

[10] This report focuses on the structural issues of the government's accountable service delivery, but, expectedly, rumours of corruption abounded in RESIS Recharge and other infrastructure work in the Flag Boshielo irrigation scheme. Allegations were that money for canals never led to even a single crop. Budgets for repair and maintenance quadrupled overnight. In 2009, Limpopo's Standing Committee on Public Accounts (Scopa) wanted the province's agriculture head charged with fraud and corruption (Makana 2009). Yet, he reappeared in the Africa Davos Debates of 2010 (https://www.youtube.com/watch?v=3r0wcooR5-I).

In line with the intense national debates about Black Economic Empowerment at the time[11], the agribusiness and irrigation business also became more racially mixed on the ground. The LDARD's extension worker at Elandskraal started trading under the name of Temong, and soon became both the Black Economic Empowerment partner of AWC and the co-owner of the Nelspruit manufacturing company of floppy systems[12]. The new partnerships of the Black Economic Empowerment partner may have strengthened the case for the leadership to mobilize funding at higher government levels. However, it made the technology choice and joint venture even less transparent for the Elandskraal and other farmers. As perceived by the Elandskraal farmers, just by his mere presence, the extension worker garnered financial benefits. Many smallholders were to raise this as a major grievance (Tapela 2009).

In order to further strengthen the case towards skeptics within and outside the government, a public discourse was created of fast progress and effective delivery: RESIS Recharge was glorified as a 'commercial' and 'business-like' approach that was suggested to finally lead to 'economic viability' of self-financed profitable farming, which would all be transferred to smallholders. Floppy systems were hailed as the symbol of South Africa's homegrown, sophisticated, commercial expertise on water-efficient and highly productive mechanized agricultural technology (various interviews). In this publicity campaign, farming for household food security, let alone constitutional rights to water or food, were ridiculed, and became an immediate criterion for disqualification and exclusion as backward and prohibiting progress (Tapela 2009; various interviews).

So, the 'contractual' arrangements in RESIS Recharge promised quick, uncontested profits for the floppy manufacturing industry and uncontested performance for the official. It gave freedom to the strategic partner to access prime land and operate costly new water infrastructure, without accountability to farmers except for sharing the net profits (without transparency how that was calculated) and providing training. Moreover, under RESIS Recharge, the strategic partner and farmers shared the gains but also the risk of losses. This shifted the production risks from the government to the strategic partner (who was willing to take this) *and also to smallholders.*

The risks for the smallholders were indeed high. By being obliged to hand over land with infrastructure, they forfeited alternative livelihood opportunities with the land and water. They already lost these opportunities from the start of the construction phase onwards. Construction could take up to 6 years. Each year, they shared the risks of crop failure and net income losses with the strategic partner. Farmers also bore the risks of the largely untested technology of floppy systems, as decided upon by others. Smallholders' land became an experimentation field, but without insurance in case of failure.

The contract was short, just 3 years. There was no exit strategy except that the strategic partner would hand over all shares to the cooperative or 'anyone appointed by the LDARD. The contract had no provision for depreciation and re-capitalization after the life cycle of infrastructure of some 10-15 years. This all provided little incentive to the strategic partner to consider sustainability.

In sum, from the very beginning, the contract in RESIS Recharge about the tripartite relationships between the state, agribusiness as assumed service provider and farmers gave all space for the government, irrigation industry and strategic partner to do as they saw fit, as long as the strategic partner shared net profits (however calculated) and provided some business training. There was no contractual power for the main short- and long-term risk takers: the farmers. They became even more dependent on the government and agribusiness than before in the hope of getting money for free. This recipe for failure unfolded as explained below.

[11] This was also the time when the names of the dam and scheme changed to 'Flag Boshielo' irrigation scheme, and the Afrikaner names of the farms became African.

[12] For the extension worker's establishment of another, partly overlapping, irrigation group in Elandskraal, and the court case on serious land conflicts, see Tapela (2009, 2016a).

## Implementation of RESIS Recharge

### Plot Holders' Organization and Construction

After these top-down decisions, LDARD contacted smallholders in the Boshielo irrigation scheme and provided them with the option to revitalize their irrigation sub-schemes with floppy systems. None of the communities were eager to consolidate all plots and give it up for years of construction of an unknown irrigation system. However, LDARD's approach was 'either this or nothing'. For example, farmers in De Paarl expressed serious doubts and their preference for food crops, but 'didn't hear from LDARD thereafter'. In Phetwane, farmers were especially reticent because of the recent negative experiences of cotton farming (Tapela 2009). In the end, there was agreement that LDARD continued with the four upstream farms (Phetwane, Mogalatsane, Kolekotela and Setlaboswana) and with one downstream (Strydkraal).

In the organization of the plot holders into a cooperative, younger men actively came forward even if they did not have plots, as they were attracted by the 'money' to be gained. Moreover, as an elderly woman commented, young men know English and may have knowledge of computers. The influence of tribal authorities in the cooperative's committee varied. While Chief Matlala had a certain voice in Phetwane, Chief Masemola's influence in Setlaboswana was less pronounced. Chief Masha's influence in Strydkraal was initially strong, but increasingly contested, as elaborated further below.

The composition of members of the cooperatives seemed quite inclusive and gender balanced, although no in-depth research is available on this issue. This relatively equal or dominant membership by women seemed well aligned to earlier *de facto* plot ownership, irrespective of PTOs, and reflected women's domination in cultivation and men's relative absence due to out-migration. Dividends were generally proportionate to plot size. If two people shared a plot, they also had to share dividends. In Kolekotela, the new floppy system did not cover all plots. While some cooperatives excluded those plot holders, others included them in the new cooperative. Yet, this land consolidation and organization came at a high price. Many smallholders kept regretting, as some respondents mentioned: "Before, we had our own plots; they were indicated with pegs. But now, we cannot even access our own plot." Moreover, during the vacation of the land and construction phase between 2005 and 2008, 2009 or later, all informal irrigation gardens along the canals, especially by elderly women, were removed without any form of compensation.

In Strydkraal, a range of initiatives took place. In 2008, a small joint venture got a floppy system that covered 20 ha. This was located in the part of the former irrigation scheme that could not be irrigated anymore with the pumps, because of major flood damage in 2002. This had 18 members. Reinforcing the glory of modern, large-scale technology, AWC even "used to come with a plane to spray chemicals" on the 20 ha floppy scheme, as commented by community members.

In addition, 13 ha were equipped, out of which AWC cultivated 8 ha, and provided water for free to a 5-ha vegetable garden of a women's group, Ikageng, with 10 members. In 2012, LDARD finalized a new joint venture with AWC by transforming former dryland into 257 ha of new center pivots, with an extension to include the center pivot that had been operated previously by Farmer B (whose 1997 contract had ended). The 263 members of this new cooperative, mostly women, included all earlier plot holders of the Strydkraal irrigation scheme and also some from the earlier Mooiplaas irrigation scheme. For this large, new scheme, called 'Mooiplaas', the strategic partner pumps water out of the gravity canal, which is fed by the weir in the Olifants River, into a high reservoir. He also maintains the canal up to that site. On yet another site, three center pivots were installed with 33 members. An apex cooperative, Likamamos, was formed. This includes the 20 ha floppy system, the 5 ha

women's garden, and the new large and smaller center pivot schemes. With strong support from the chief, the female leader of the women's garden and a man became the leaders of this apex cooperative.

## Production in RESIS Recharge

Table 2 provides an overview of the joint ventures: name, area (size of the farm), number of cooperative members, crops, and technology/ irrigated cropping seasons (LDARD; Tapela 2009; Sithole 2011; Barbara van Koppen field notes).

## Collapse and Troubled Continuity

### *Disappointing Dividends*

In the first years, in particular, dividends for the cooperative members were in the order of USD 200-800 per cropping season. However, in later years, dividends tended to reduce. In the case of potatoes, this was possibly due to declining soil fertility. However, in each farm, there were already seasons with net losses, as announced by AWC, so the community did not receive anything. This hit hard. AWC's proposition to even put the losses on the cooperatives' next year's accounts

TABLE 2. Characteristics of joint ventures in the Flag Boshielo irrigation scheme as in 2017 (i.e., 'to date').

| Name (former name) | Area (ha) | Number of cooperative members (female [%]) | Crops | Years of functioning |
|---|---|---|---|---|
| Elandskraal Balemi Irrigation Scheme Trust[a] | 197<br>150 for EBIS Trust | 12 | Maize, cotton, wheat, vegetables | Center pivots 2005-2016 |
| Phetwane (Hindustan) | 52 | 56 (70%) | Potatoes, maize | Floppies 2009- to date |
| Mogalatsane (Coetzeesdraai) | 133 | 98 | Potatoes, maize | Floppies 2009-2012 |
| Kolekotela (Krokodilheuwel) | 243 (220 floppy) | 202 (48%) | Potatoes, maize | Floppies 2009-2011 |
| Setlaboswana (Vogelstruiskoppie) | 114 | 96 (49%) | Potatoes, maize | Floppies 2009-2011 |
| Strydkraal and Mooiplaas | Until the end of the 1990s - 338 ha<br>2008 - to date: floppies 20 ha<br>2008 - to date: sprinkler 13 ha (with 5 ha for Ikageng women's garden and 8 ha by AWC)<br>2012 - to date: 15 center pivots on 300 ha | Floppy: 18 Ikageng, garden: 10 women<br>15 center pivots: 296 (mostly women) | Vegetables maize, wheat | Floppies, center pivorts 2008 - to date |

*Sources:* LDARD; Tapela 2009; Sithole 2011; Barbara van Koppen field notes.

*Notes:*

[a] See Tapela (2009) for the Kgotlelo Balemi Irrigation Cooperative established in 2008 with Temong.

was totally unacceptable. LDARD also refused to chip in. Government officials emphasized that such variability is inevitable in commercial farming and that 'communities should understand this'. Conflicts about various issues arose, especially in the years with losses.

As a result, by 2012, all four upstream farms had stopped working with AWC, two of them before expiry of the three-year contract. Only one scheme, Phetwane, is still operational with another strategic partner and still requires major government subsidies. The other three farms have been abandoned, fell into disrepair and got vandalized. They now depend on the next rounds of public support for repair. In the floppy systems in Mogalatsane, the LDARD started rehabilitation of the schemes once again. In 2014, AWC also stopped the joint venture on the brand new 276 ha scheme in Strydkraal.

### *The Contentious Issues*

Among the conflicts that particularly escalated in years of claimed net losses, the single most important issue was the lack of transparency about the strategic partner's business. The farm enterprise, its expenditure and income, as well as other farm operations lacked any transparency to the cooperatives. When cooperative smallholders tried to search for clarity about the income gained from the sale or other farm budget items, they only managed to talk to AWC's farm managers as the middlemen who were regularly on site. These middlemen (and AWC himself) typically referred to the LDARD for any questions. However, the LDARD failed to provide clarity on AWC's farm budgets either, probably because they did not know.

Another allegation was that AWC had hardly given any training at all to community members – neither active on-the-job training nor any formal training. In the four upstream farms, two persons of each farm were trained as pump operators; one of them, fascinated by the high technology, stated how he could 'switch the pump on and off at a distance from his mobile'. Two others were trained in health and safety issues. One person was trained in operating the floppy irrigation system (Tapela 2009). In Strydkraal, a respondent stated how AWC called people for training. Five people went, but it then appeared that 'a person needed to have knowledge of maths and physics' to be selected for the training. Four people were sent back for that reason and then the last one also went back.

The other promised benefit of the joint venture was paid employment. Job opportunities were in high demand and the cooperatives diligently registered for the work provided and the payment. Security guards and the pump operator got full-time jobs. However, jobs had been limited as most operations were mechanized. In Mogalatsane, for example, planting provided 2 days of work to 100 persons, while harvesting provided 2 days of labor to 60 people. The wage was USD 5 per day, so below the minimum wage.

The conflicts had different implications in the five joint ventures on the right bank of the Olifants River scheme.

### *Phetwane*

In Phetwane, women farmers complained that AWC 'even came in the night to put chemicals, so that the community did not know what he did'. After two winter seasons of cultivating potatoes from 2009-2011, they felt that 'enough is enough'. AWC decided to stop the contract and the Phetwane smallholders continued on their own, while LDARD still paid for some (but insufficient) fertilizer, other inputs, the electricity bill, tractor services and infrastructure repairs. The income from local sales was very low: just enough to pay the laborers. Lack of transparency on accounting issues continued to divide the committees. Regular election of new committees failed to bring real solutions. Only in 2015 did production increase again with a new, self-selected strategic partner and continued support from LDARD (Tapela 2016a). President Zuma visited this 'success story' in 2013.

### *The Collapsed Joint Ventures*

Internal tensions emerged in Mogalatsane. The committee's news that AWC had announced there were losses was met with considerable suspicion among members that money had disappeared

in the pockets of the committee members. New committees were elected, but with continued lack of information from AWC nothing changed (Mapedza et al. 2016).

In Setlaboswana, there was suspicion among several young men about AWC's claims of losses, in spite of – as they stated – the 'truck loads of potatoes that left the field'. This was the reason why these young men travelled to the potato buyer to check. In 2010, they even opened a court case with the paid support of a lawyer from Pretoria to defend their case. However, given the contract, their chances of winning the case were slim, while litigation costs were very high. Debates on how to handle this conflict split the cooperative (Mapedza et al. 2016).

Thus, with growing internal tensions, these cooperatives bore the brunt of the losses and the lack of transparency about the 'big cake'. However, even the 'crumbs of the cake' caused conflicts. For example, AWC suggested that the remnants of the potato harvest were free for picking by any villager, while the cooperatives tended to see those benefits as the reward of cooperative members only.

The losses for the three discontinued cooperatives were not confined to these disappointing short-term gains. The long-term losses were forfeited alternative uses of the barren land and water, including the former informal uses of the canals and reduced soil fertility. Moreover, vandalism and theft of copper cables and transformers became rife as soon as the cooperatives had decided to discontinue with AWC. The pooling of land into one scheme, in which 'people didn't know their land anymore', as mentioned above, further disempowered communities to regain control.

The smallholders lost considerably more than the other two partners in the triangle, who kept their jobs (government) or did good business and expanded their expertise without longer-term risks (agribusiness). The commercial irrigation manufacturers and designers sold expensive equipment with a view to gaining as much profit as possible; they piloted innovative floppy equipment without risks; ensured that any future breakdown of the floppies would warrant the company's expertise and products for repair and rehabilitation; and they further carved out a niche in the competitive market of irrigation equipment manufacturers.

The gains for the strategic partner were the main 'catch 22' of the RESIS Recharge joint ventures. Both the strategic partner and the cooperatives shared a similar goal of quick wins for profit. Dividends were the main and highly appreciated benefits for the cooperatives. AWC also went for quick wins and dividends in his trade-offs between either spending his scarce time on capital-intensive production and sale for maximum profits or spending time on training of business clerks, as stipulated in the contract. He had no incentive at all to go beyond the contract and take time to answer questions about - already complex - farm budgets, let alone proactively inform or even train smallholders in finances. Similarly, there was no incentive at all for the strategic partner to reduce the sophisticated mechanization in order to employ more wage laborers with the likely logistic issues or else the labor conflicts; to facilitate new relationships of trust between the smallholder cooperatives and his own input providers and outlet channels, which he had built during a lifetime at high transaction costs and which were historically rooted in the white agribusiness that had been forged over a century to outcompete black producers and subjugate them to consumers and wage laborers. Lastly, the strategic partner bore no risks of long-term resource degradation and other externalities. So, his cultivation of potatoes during several subsequent seasons served quick wins but reduced fertility. As an irrigation consultant commented, no commercial farmer would do that on their own land. Thus, a strategic partner is not *a priori* a service provider.

Paradoxically, the government got squeezed in the tripartite relationship. An extension worker stated how he had tried to facilitate more communication between the smallholders and the strategic partner, but some smallholders misinterpreted his genuine attempts and were suspicious that he 'did not want smallholders to progress'. This rendered the extension worker hesitant to try again.

***Strydkraal***

In Strydkraal, the lack of transparency took another turn. Learning from earlier experiences of the chief's contract with Farmer B and the smaller floppy schemes in Strydkraal, and experiences in the other four joint ventures, Chief Masha and the apex cooperative leadership negotiated more transparency from AWC. The leadership of the apex cooperative assertively claimed to keep accounts of the inputs, number of trucks leaving the fields and income gained. They also insisted on jointly deciding about the crop. Unlike the upstream cooperatives, the Strydkraal cooperative resisted the cultivation of potatoes because of the soil depletion and the risk of plant disease when potatoes are grown in consecutive seasons.

However, in the eyes of some members, all this information failed to be sufficiently communicated to them. This escalated when there were no profits. Chief Masha had already been 'under siege of his subjects' in the land restitution claim to the land in Kalkfontein from which the community had been forcefully removed in the 1950s. In that claim, some of his 'subjects' challenged the chieftaincy's power and claimed an equal status in the Community Property Association that was given the land for exploitation. The same contest spilled over to the apex cooperative. Younger male members lodged a strong case to both the apex leadership *and* the LDARD to provide full transparency about investments made in Strydkraal. During the same time, the house of the woman cooperative leader was burned. Probably being more vulnerable as a woman, she left to live elsewhere. When AWC decided to leave Strydkraal, the young male members negotiated with the same Farmer B to return as a strategic partner to Strydkraal for the new large scheme. Women, the majority of members of the new 'Mooiplaas' scheme, avoided being drawn into this conflict, bearing the brunt of intra-community conflict in this village as well (Barbara van Koppen, field notes).

LDARD's strict focus on joint ventures implied that all other irrigated farms that had collapsed remained without support. The situation was the same for the many other inhabitants in the Flag Boshielo area, for which the original RESIS program had also envisaged support. Some cooperative members and, in particular, those who had been excluded altogether found other land and water to be used for production. This was partly in response to the collapse of the irrigation schemes, but also due to dwindling employment opportunities or to the still untapped profit-making investment opportunities of the fertile land and water. For most micro- and small-scale farmers, production was a basic survival need. Some examples are explained below.

## Informal Water Development

In the farms that had been rejected as candidates for joint ventures, individual farmers started to use the abandoned infrastructure as needed. Thus, farmers 'redesigned' the canal from the Piet Gouws Dam through punctures leading water through long furrows to individuals' fields, some of which were as large as 5 ha (Tapela 2009). In Mooiplaas, a wealthier relative of Chief Masha living in Johannesburg started to invest in an area adjacent to the river that is prone to damage from flooding. Such lands are generally seen as too risky by the LDARD to be used for full-fledged development.

Poor men and women also took up artisanal fisheries with very small nets in the river and dam to meet basic livelihood needs. However, government officials chased them for fishing without a license.

The various water sources and a variety of technologies, including diversions from rivers or canals, small mechanized pumps, rainwater harvesting and wetland uses, also provided water for livestock, brick making and small-scale enterprises, especially at homesteads. Water supplies to homesteads played a major role. It had been a central focus in the vibrant community initiatives during the 1990s when the country moved to liberation. In the Flag Boshielo area, development forums of 63 villages had spontaneously organized to compile an inventory of existing water points and their status. They

proposed to provide for 50 liters per capita per day. They offered their insights and readiness to assist with the construction of pipes to the Lepelle Northern Water Board. This Board had started constructing a treatment plant just below the Flag Boshielo Dam with the intention of providing drinking water to downstream villages. However, the Lepelle Northern Water Board rejected this support (MaTshepo Khumbane, grassroots activist, pers. comm. March 25, 2004).

Twenty years later, the Board provided piped water to part of the Olifants River scheme only. As studied in the four upstream villages (Tapela 2009), the water supply was also used for homestead cultivation, in addition to using it for drinking and other domestic purposes. This improved food security for many more households in the village, including households that had no plot in the scheme. Over time, that proportion had grown, for example, to 75% of all households in Phetwane and 38% in Kolekotela. They had also lost access to the informal gardens along the canals.

However, the Lepelle Northern Water Board charged significant payments. Allegedly, this was only for any water quantities above the 6,000 liters per household per day, the cut-off point in South Africa's Free Basic Water Policy. In all four villages, the average consumption was less than 6,000 liters per household per day, but water users were still charged for this 'free' basic water (Tapela 2009). Water bills were sometimes extraordinarily high. Villagers generally realized that non-payment of this water will be unsustainable in the long term. Even households (with household connections and meters) that failed to pay bills in the short term refrained from using much water, fearing high water bills at a later stage. Some other households had installed illegal connections without a meter, partly because of the delays. Where possible, households continued using water from communal boreholes of the apartheid era. For the poorest households who had no connection at all, these boreholes were the only source of water. Households that even lacked access to a borehole asked neighbors for permission to use their water supplies, or they went to the river and canals (Tapela 2009).

In downstream Strydkraal, an area not served by the Lepelle Northern Water Board, the municipality failed to provide any water either from pre-1994 or post-1994 boreholes, reservoirs or piped gravity schemes. The reservoir appeared to be too small to provide water to the rapidly expanding population. In the absence of adequate state support, private water vendors with donkey carts or cars took up the task of supplying water. They sold a 200 liter drum of water for USD 2 or USD 3. Some women used and reused this very expensive water to irrigate the vegetables and trees in their homesteads. So, in Strydkraal, state-subsidized, high-tech floppy systems abundantly irrigated over 300 ha of crops, while women paid very high prices for water or carried dirty water with buckets and wheelbarrows from nearby gravity canals, or even worse from the distant, crocodile-infested Olifants River.

In Strydkraal, MaTshepo Khumbane, founding member of the Water for Food Movement, bridged this gap bottom up. Through mind mobilization workshops for all, including the poorest 'nobodies', she encouraged participants to design plans for their own homesteads as the space where women, in particular, can start exerting control over their lives. She trained them in the harvesting of runoff and roof water in underground tanks. Together with weather charting and soil fertility measures, she encouraged the use and reuse of this water for vegetable cultivation or small-scale enterprises for home consumption and sale. With the escalating conflicts in the Strydkraal cooperative, women reverted back to this option (Barbara van Koppen, field notes).

On the basis of the foregoing analysis of events within and outside the joint ventures, we now turn to the lessons learned in the national Irrigation Strategy and provide recommendations on how to further operationalize the proposed activities in the accountability triangle between the state, service providers and farmers.

# Discussion, Conclusions and Recommendations

## Policy Framework

The foregoing findings about joint ventures in the Flag Boshielo irrigation scheme corroborate the current government's policies, as mentioned in the *Introduction*. This holds for the general agricultural policies that emphasize diversity and differentiate between different typologies of smallholders (subsistence and homestead-based production; smallholders in 'loose' and 'tight' value chains; and independent commercial smallholders). The findings also corroborate the importance of the national Irrigation Strategy, in general (participatory planning with full respect for farmers' preferences and holistic interventions that consider all aspects, avoiding that projects primarily focus on infrastructure construction). Specifically, the present analysis supports that the option of joint ventures with its three potential advantages remains, but explicitly as only one of the options and with specific additional conditions (stop encouraging joint ventures with strategic partners from the top down, and only accept joint ventures for funding if farmers were contractually and factually involved as decision makers; ensure that the strategic partner transfers skills; and monitor the joint venture's contractual agreements and mediate in conflict resolution). The findings suggest that these conditions can be further specified as explained below.

## Enabling and Monitoring the Short Route to Accountability

The importance of a strong, short route to accountability (farmers' decision making in a bilateral contract with the strategic partner) was confirmed. The three continuing joint ventures started with a self-chosen strategic partner and bilateral contract (Elandskraal) or moved to that (Phetwane and Strydkraal). Smallholders' option to choose among strategic partners enhances their bargaining position.

The choice can also be widened to other modes of farming. Out-grower arrangements, as in the short period of cotton cultivation, could be revived with better mutual compliance and risk management. Another arrangement in the Flag Boshielo irrigation scheme is the leasing of land to a farm manager for a fixed amount, as done by the tribal authorities in Strydkraal to Farmer B from 1997 to 2007, and in Veeplaas to Farmer B since 2001. However, in Veeplaas, the lease amounts paid were low. Comparison with a market value would empower them.

Experience in the Flag Boshielo irrigation scheme showed the negative impacts of the weak contents and limited monitoring of the contract in RESIS Recharge. Hence, in addition to the sharing arrangements of inputs, production process and benefits in the contract, it is recommended that more attention is given to the following:

- Governance structures that ensure full transparency and an equal, if not a majority, say for smallholders.
- Feasible enforcement arrangements, as well as equitable conflict resolution procedures, in which the government may assume a fallback role.
- A further specification of which and whose skills are to be improved, how and when. This would go beyond business clerks and include: transfer of skilled farm labor and farm management, and effective smallholder access to agribusiness input and marketing networks.
- Options for more employment generation, instead of full-blown mechanization.
- Ways to deal with externalities and longer-term risks. The government can play the public function of absorbing risks and providing insurance against shocks and averse events.
- Exit strategies.

Within the smallholders' cooperative or other organizations, there should be clear intra-group membership obligations and rights, and accountable leadership procedures.

Further, it is recommended to further support regional and national exchange among smallholders, and between smallholders, strategic partners and agribusiness to compare and learn about model contracts and experiences, as in the policy dialogue in 2009. Exchange even just within the Flag Boshielo irrigation scheme would overcome the scheme's decades-old divisions along tribal lines and the post-2000 division of the scheme over four municipalities.

Under these conditions, smallholders can produce and develop their capacities while strategic partners can bring their three advantages: capital for inputs, technological skills, and forward and backward linkages. New public loan facilities for smallholders would further reduce smallholders' dependency on the agribusiness' capital.

In addition to enabling and monitoring a robust and transparent short route to accountability, the government maintains important mandates about land and water, both within and outside joint ventures. These government mandates are part of the second leg of the long route to accountability, in which policy makers shape the government's service delivery interventions on the ground. The events in the Flag Boshielo irrigation scheme and elsewhere suggest the recommendations explained below.

## Shaping the Second Leg of the Long Route to Accountability

### *Land Tenure*

The government is the custodian of land in former homelands and often the formal owner of irrigated land, whether in the sharecropping arrangements of joint ventures, out-growers, lease arrangements or in smallholder schemes. Smallholders may not even be aware of the value of their land and can lose out, especially when they are in immediate dire need for cash. Improved tenure security, which will also increase the land value, can considerably strengthen smallholders' bargaining position vis-à-vis outside partners.

Moreover, land tenure is key for intra-group relations. It is often a bone of intra-community contention, as in Elandskraal, where it halted production, or in Strydkraal, where the traditional tribal power over land was strongly contested and led to intra-village tensions. In smallholder schemes, lease markets already exist widely. Formalization of these can further strengthen both tenure security and production, also in heterogeneous schemes (Manona et al. 2010; van Averbeke et al. 2011). For any land tenure, including irrigation schemes, the government is the duty bearer of women's constitutional land rights. Tenure security for young women and men is likely to support their engagement in production (Manona et al. 2010). Hence, the government's proactive tenure reform in smallholder irrigation is recommended.

### *Irrigation Infrastructure*

In the joint ventures of the Flag Boshielo irrigation scheme, the government took the responsibility for installing new irrigation equipment, obtained from the irrigation industry. This was the most expensive component of the revitalization of irrigation schemes, and a main attraction for the strategic partner. The continuation of the irrigation industry's preference for large-scale, centrally controlled technology warranted the pooling of the individual plots of the pre-1994 out-grower arrangements into the one, centrally managed scheme of the joint venture. The type of irrigation infrastructure also appeared to strongly influence the performance of smallholders' irrigation elsewhere. A study of South Africa's 206 irrigation schemes (van Averbeke et al. 2011) showed that the percentages of functionality were highest for gravity-fed canals, which have the lowest operation costs and can be most easily controlled by many small farmers: 81%. In contrast, only 70% of pumped surface irrigation schemes, 65% of overhead irrigation and 56% percent of micro-irrigation schemes were still operational.

Farmers' self-financed initiatives are often carried out individually or by small groups, e.g., river diversions, small pumps, wetland use or rainwater harvesting.

Therefore, it is the government's function and niche to move beyond the current irrigation industry's large-scale technologies. This entails the development and provision of a wider range of small-scale technologies at better prices, with more training, aftercare and repair opportunities for both women and men. Rural electrification at affordable prices will further boost smallholders' adoption of irrigation infrastructure. Collaboration with the water supply utilities can cost-effectively augment the volumes of subsidized water supplies for homestead-based cultivation.

For participatory infrastructure rehabilitation or new construction in joint ventures and smallholder schemes alike, smallholders' choice should include the range of design elements: the siting of the technology, own contributions, future arrangements for operation and maintenance, responsibilities for longer-term replacement of infrastructure, and strategies for long-term rehabilitation and replacement, or exit. Participatory design is a necessary condition to break the build-neglect-rebuild syndrome of top-down defined and supply-driven 'technological fixes'.

## In Sum

This 'biography of the Flag Boshielo irrigation scheme' highlighted the rise and fall of a range of configurations between states (with very different goals and constituencies), corporate service providers (the largely continuing large-scale irrigation industry and large-scale farming business) and inhabitants of the scheme. Much of the once-productive land still remains idle. Joint ventures are one of the options; the range of options is wider and includes land leasing, out-grower arrangements, and smallholder-managed production and sale, including proactive support for existing – and currently atomistic – informal arrangements and management. Research to assess, in more detail, smallholder irrigators' preferences, and to compare costs and benefits of the range of past and potential configurations is recommended to further inform policies in South Africa and elsewhere.

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Water, Land and Ecosystems

ISSN: 1026-0862
ISBN: 978-92-9090-862-3