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Towards an Analytical Framework for Assessing Property Rights to Natural Resources: A Case Study in the Communal Areas of Zimbabwe

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Abstract

A taxonomy for describing property rights to natural resources is described and applied in a Zimbabwean case study. The taxonomy allows: tenures to be systematically compared and contrasted; incentives for natural resource management to be identified; and the evolution of tenure to natural resources to be assessed. In the case study, we find: key differences between tenure types, all termed "communal"; a wide range of tenure arrangements that transcend concepts of "tree" and "land tenure"; information suggesting that the promotion of tree planting may work on some tenure types, but is likely to fail on others; and that the evolution of indigenous tenure to natural resources seems to have been somewhat immune from external changes in institutional systems. Prospects for further theoretical and empirical advances are discussed within the context of the property rights framework presented.

Key words: Incentives, Natural Resources, Property Rights Framework/Taxonomy, Tenure, Zimbabwe.

1. Introduction

The evolution of property right systems and their effects on household management of natural resources has been widely studied in the economics and sociological literature. The role of the state in codifying and protecting land rights is regarded in many discussions as important for providing the necessary conditions for efficient resource use. Property rights are thought to affect the expansion of the market system, production and distribution of output, and affect incentives to efficiently manage resources. Unclear or insecure rights are thought to inhibit exchange, erode incentives to invest in activities that increase long term productivity of resources, and affect the amount of output produced in the economy. Economic theory predicts that individuals can be expected to preserve their own long-term best interest through efficient management decisions, particularly if they know that they are the custodians of the resources involved for the long-term, and that perhaps these resources will be passed to his/ her descendants in the future. Many empirical studies link the absence of well-defined property rights to rapid loss of vegetation cover, overgrazing, and soil erosion.

Existing literature on communal tenures in Zimbabwe attributes widespread resource degradation to the collapse of property rights systems in the communal areas (Bruce et al, 1993; Scoones and Matose, 1993; Nhira

and Fortmann, 1993), partly as a result of government intervention and partly as a result of increased rural population. Since the 1980s, the rural population has been growing rapidly resulting in an increased demand for land. With many communal areas experiencing severe land shortages, there has been a marked rural migration to relatively less populated areas in search of land. In areas that have experienced significant in-migration, conflicts between new settlers and the traditional resource management regimes of the original inhabits, and newcomers unfamiliarity with the local ecological conditions, have been blamed for contributing to resource degradation (Sithole and Bradley, 1995; Fortmann, 1993).

Although the critical role that may be played by the state in the creation and enforcement of property rights is widely recognized, some observers caution against ill-conceived or misinformed government intervention in land tenure issues. In some Sub-Saharan African countries where land is held under dualistic tenure systems (indigenous/ communal tenure and individual ownership), post-colonial law has tried to marginalise the influences of the institutions of indigenous tenures, in favour of state control or individual ownership (Cheater, 1990). For example, in Zimbabwe, the Communal Lands Act of 1982 withdrew the rights of traditional leaders (chiefs/headmen and kraalheads (*masabkuku*)) to allocate land. Instead, occupation of communal land became subject to the consent of the district council, represented at the village level by the Village Development Committee (VIDCO). This change upset centuries old traditional land and resource control institutions (Murphree and Cumming, 1991; Scoones and Matose, 1993). Due to a lack of resources and limited administrative capacity, the state has had difficulty developing effective resource management regimes in place of indigenous tenure systems.

Although there is widespread agreement on the importance of property rights in natural resource issues, in Zimbabwe and elsewhere, the ways in which these property rights have been perceived and described have varied widely. Previous studies that have sought to describe tenures in the communal areas of Zimbabwe and elsewhere have used such categories as “public”, “private” and “common property”, or “land tenure” and “tree tenure”.[1] Such differences in characterizations of property rights have lead to confusion regarding incentives associated with alternative tenure forms, and whether and how tenures have changed over time.

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[1] In this paper, the term “property rights” and “tenure” will be used interchangeably to refer to the vast variety of different combinations of conditions that may be placed on the use of resources by various social institutions.

In this paper, we describe tenures using a more generalized framework similar to that used in Haley and Luckert (1990)[2]. The framework describes tenures in terms of a number of categories of social conditions (each of which may be defined to varying degrees) which may enhance or restrict the value of a resource and affect the economic behaviour of households. We use this framework towards four ends. First we collect information within this framework that we use to describe and contrast four different types of tenures (homestead land, garden plots, agricultural land and indigenous woodlands) of Jinga village, in Mutambara Communal Area in eastern Zimbabwe. Second, we examine the incentives created by the existing tenure rules. Although the complexity of the multiple effects of tenure characteristics prevents us from explicitly predicting management behavior, we provide some insights on the potential to promote tree planting. Third, by using this framework, we investigate the claim that property rights in the communal areas have broken down resulting in the unregulated use of resources and resource degradation. Finally, we discuss how the framework may be used to facilitate tenure research in the face of theoretical and empirical barriers.

In the following section we briefly review how the existing literature describes land and natural resource tenures in general, and specifically, in the communal areas in Zimbabwe. We then proceed to identify a number of problems that such approaches have encountered with respect to the three issues outlined above. Section three presents the framework used in this study to collect information on tenures in the case study area. The study site and the survey methods used to collect the information reported here are described in section 4. Section 5 reports the findings of the study, while discussion and implication of the results of the study are contained in section 6. Section 7 concludes.

2. Current Approaches to Assessing Property Rights

Tenures have been defined and described in numerous ways, frequently varying according to the disciplinary background of the researcher and the issues which are being investigated. For example, tenures have been defined as a "bundle of rights" (e.g. Alchian and Demsetz 1973) or as "The rights and patterns of control over land" (Norton and Alwang 1993). While such definitions of tenure are quite general, within such concepts, tenures

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[2] Haley and Luckert (1990) apply their property rights characterization taxonomy to industrial forest tenures in Canada.

in Zimbabwe and elsewhere have been more specifically defined by categories such as “public”, “private” or “common property”. Furthermore, like in many other developing countries, land tenures in Zimbabwe have also sometimes been classified into two broad categories: “traditional”/ “indigenous tenures” and “modern tenures”. Indigenous tenures (synonymous with communal tenures) are based on traditions and customs of the people, and are enforced through group consensus. Statutory laws which govern “modern tenures” (synonymous with private ownership) have precedence over customary law (the body of laws governing traditional tenures). The presence of a dual legal system may create ambiguities and uncertainties, making it difficult to forecast the outcome of legal action when land rights are disputed (Johnson, 1972).

A number of problems have arisen as a result of such discrete concepts of tenure to natural resources. To begin with, researchers have frequently found that labels associated with types of tenures are too simple to fit the complexities of the many types of tenures found in reality. For example, the historical confusion over concepts of “common property” and “open access” were largely caused by the failure to recognize different degrees of exclusion between different types of tenures. “Communal tenure”, is widely defined as a case where land ownership is assigned to the corporate group, whilst individuals are assigned a limited set of use and transfer rights. However, communal tenures are complex, and the above distinctions do not recognise that whilst a household may have exclusive rights for cultivation of crops on agricultural land, indigenous trees growing on such land could be communal property. Likewise, the state or other levels of government (district councils) may have rights to the timber on communally owned or individually held land. This aspect of communal tenures is common and well documented and has lead to distinctions between “tree tenure” and “land tenure” (Bruce and Fortmann, 1988; Bruce et al, 1993; Nhira and Fortmann, 1993). However, while these tenure concepts allow for different sets of rules between different types of natural resources, they stop short of systematically identifying the varying degrees to which a great variety of social conditions are placed on the use of a number of natural resources.

Another problem relates to the lack of success in identifying links between natural resource tenures and the performance or behavior of villages, households, or individuals. With tenures being considered as discrete types, empirical studies have typically noted significant differences in management activities between tenure

types.[3] Such studies, while useful in some respects, have not provided policy makers with the guidance desired. With empirical work concentrating on significant differences in performance between categories of tenures, explanations as to why these results differ between tenure types have been largely conjectural. Problems arise because it is not clear how complex incentives created by tenures are influencing behavior or performance. Without information on the effects of specific attributes of tenure, policy has received little direction with respect to how tenures can be incrementally changed to change management incentives.

Finally, the lack of a flexible framework, capable of capturing the complexity of tenures has impeded investigations into tenure evolution. Restricted by discrete concepts of tenure, marginal changes of elements of tenures over time may not be discernible. In order to document whether and how tenures are changing, the relevant attributes of tenures must be identified and monitored.

The above problems indicate that a more generalized, robust approach is needed to investigate behavioral consequences of the great variety of tenure types that exist. Potential solutions to the above problems may be evident in the basic definitions of tenures, outlined above, which define tenures as property rights. The explicit recognition of land tenures as variations in property rights leads us to literature on property rights for guidance in defining concepts of tenures.

Like tenures, property rights have been defined in many ways.[4] However, common to most definitions is the assertion that property derives its value from two primary components: 1) some actual good or service , and 2) the social conditions which restrict or promote the use of a good or the provision of a service. It follows from the above definition of property rights, that there are as many kinds of property right structures as there are different combinations of social conditions which may be placed on the use of a good, or the provision of a service.

One means of depicting the broad range of property rights is along a spectrum, where the endpoints are, respectively, defined as private and public property. At the private end of the spectrum there are no social

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[3]Studies relating discrete types of tenure to management performance include examples from agriculture and forestry. With regards to forest resources, see for example Zhang (1996), Zhang and Pearse (1994a, 1994b), Deacon (1994), and Luckert and Haley (1990). With regards to agricultural production see for example, Anderson and Lueck (1992), Feder and Onchan (1987), Feder *et al*. (1988), and Place and Hazell (1993). A notable exception to this trend of investigating impacts of discrete types of tenures is a study by Place (1995) which has begun to isolate out effects of individual characteristics in an agroforestry context.

[4]For an example of some of these definitions, see Haley and Luckert (1990).

constraints and, accordingly, firms may do as they wish with their property. As one proceeds towards the public end of the spectrum, social conditions increase as property rights are increasingly transferred to public control. While neither extreme is likely, the purpose of the spectrum is to conceptualize varying mixes of private/public control.

The vast variety of social conditions that may accompany the use of a good or service may be categorized as characteristics of property rights. Each of these characteristics may be thought of as representing a variable in a property rights framework. Haley and Luckert (1990) building on the work of Scott and Johnson (1983) have identified a number of characteristics of forest tenures that are hypothesized to have predictable effects on the management behavior of tenure holders.

3. Characteristics of Tenures

The following characteristics may be thought of as a framework, or taxonomy, for classifying different types of tenures. Taxonomies represent models, or abstractions, that attempt to classify a complex world to facilitate better human understanding. Given that the world is inevitably more complex than the model, there are inevitably some aspects of problems that do not neatly fit into taxonomies. The following is no exception. Among other complications, the components of tenures are highly interrelated. Accordingly, it is difficult to discuss each characteristic in isolation. Nonetheless, the following characteristics have been identified in the literature as distinct concepts that may form the basis for categorizing tenures.

Comprehensiveness

Comprehensiveness refers to the number and types of resource attributes over which households have control. A given type of tenure does not always confer the right to use all resources in an allotment. For example, while households may possess rights to grow crops or trees in agricultural plots, they may be restricted from mining minerals.

Less than completely comprehensive property rights may adversely affect resource allocation. For example, the advantage of an integrated approach to management of resources afforded by completely comprehensive property rights which facilitate the supply of multiple products may be forgone (Haley and Luckert, 1990). However, given that many production activities are carried out by a specialised firm or household, it may

not be in society's interest to allocate comprehensive tenure to any one firm or household. For example, it may be prudent to assign to the farmer rights to utilise the surface of a given land area, while the rights to minerals may be assigned to a miner. On the other hand, mining may disrupt agricultural activities resulting in costs to farmers. In the presence of well-functioning markets, and if property rights are well defined, it is conceivable that farmers and miners will engage in negotiations which will result in an optimum resource management strategy, in terms of producing an efficient mix and quantity of outputs[5]. There are many instances described in the literature where market solutions are not always consistent with social goals[6], and quite often government regulation is the chosen alternative. In such instances policy-makers may decide on how comprehensive to make tenures by weighing the benefits of integrated management relative to the benefits of specialised resource management.

Exclusiveness

Exclusiveness refers to the ability of a tenure holder to prevent other parties form freely enjoying the benefits of a resource (otherwise open access prevails). Individuals or households may have the right to exclude others from enjoying the benefits of certain resources. For example, individual rights may be held to fruits from planted trees located in agricultural land, garden plots or homestead land, while rights to other resources may be held commonly by a finite and identifiable group of households, such as rights to a grazing commons. Exclusivity creates incentives to seek highest-valued use for resources by allowing those who bear the costs of managing and protecting resources to capture the benefits generated by the resources (Pejovich, 1990). Lack of exclusivity erodes incentives for investment since there is no guarantee of capturing the returns. A classic example is Hardin's (1968) herder, who increases his/ her herd in a grazing commons and appropriates all the benefits from selling more animals but does not incur the full cost of overgrazing (the cost is spread across all joint owners of the commons). It has been thought for a long time that when property rights to a valuable resource are not well-defined the resource will be inefficiently managed (Scott, 1955; Gordon, 1954).

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[5] This insight can be gleaned from Coase's theorem (Coase, 1960) concerning external economies, with a long list of caveats such as transactions costs, that can preclude or distort Coasian negotiations.

[6] For example, a market based mechanism would fail to supply socially optimum levels of non-marketed environmental services such as watershed protection produced by forests.

Sometimes it may be efficient not to assign exclusive rights for the use of certain resources. For example, when a resource is abundant relative to the demand, the costs of assigning exclusive rights may not be justified by the potential benefits of individualised property rights. Sometimes underlying economic factors may require communal exploitation of resources. Dasgupta and Maler (1993) note that resources characterised by low density and low predictability are often exploited communally (e.g. pastures and water in arid areas). The absence of individual exclusiveness may also serve as a risk-sharing strategy, allowing access to resources for those desperately in need of making a livelihood. Falconer and Arnold (1989) report an increased reliance by households on common pool resources in times of economic stress.

Use Designation

Use designation limits activities that tenure holders can carry out on a given type of tenure. For example, under some tenure arrangements a household may have rights to grow agricultural crops, but may not convert the land to woodlands. Likewise tenure rules that allow a household to collect poles on a given area may not necessarily entitle the household to grow trees in the specified area. Use designation lowers the value of the asset (in terms of utility generated by the asset), due to reduced demand for the asset by potential buyers (Demsetz, 1964; Johnson, 1972). The stricter the use restrictions, the lower the value of the asset.

Frequently, use designation is used to mitigate negative externalities of using resources in certain ways to ensure the continued supply of indivisible or non-market products. For example, the supply of indigenous woodlands may be maintained by use designations that prevent conversion into individualised agricultural parcels.

Duration

In most cases, tenures specify the period over which property rights can be exercised. For example, under “private ownership”, a perpetual duration is usually implied. In contrast, leases of agricultural land can be for one or more seasons. The duration of tenure will have an impact on household investment decisions. When the duration specified is short, and renewal of the tenure is not possible or uncertain, investments which would otherwise have a positive net present value but require time horizons longer than the specified duration of the tenure before returns are realised will not be undertaken. However, in some circumstances leaving the duration of

tenures unspecified serves important social functions, for example, Fortmann (1996) points out that such a strategy is a way to allow continued bargaining which is a way of establishing important social networks[7]

Allotment Type

Allotment type refers to whether the tenure specifies an area over which a household possesses rights, or whether the tenure specifies volumes of natural resources which may be collected by the household. For example, households may collect construction poles or quantities of wild fruits for personal use from any location within the village's indigenous woodlands. On the other hand, property rights may be assigned to a specific area, as is frequently the case for agricultural land and garden plots.

An allotment which allows households to harvest limited amounts of a spatially spread resource may not be conducive for managing resources for the long term. In such cases, households are likely to choose harvesting strategies that involve high-grading (selection of highly desirable trees) with little attention paid to other species and the long term productivity of the land, since households do not have an assurance of capturing returns in the future. However, an area-based tenure may create incentives for households to acquire site specific knowledge which might be used to enhance the value of the resource.

Size

The size of a tenure refers to the spatial or volume specification of the tenure. This dimension of tenures may greatly affect the economic behaviour of households. With restricted size (spatial), production can only be increased by intensifying the use of certain factors of production, for example, labour. Those households wishing to use forms of capital, such as tractors and combine harvesters, may not find it feasible to operate in a small-sized niche.

When tenures are transferable and divisible, the observed tenure sizes in equilibrium may reflect the point where economies of scale are realised. When market processes are not operational and the alternative mechanisms

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[7] Some anthropologists and sociologists have argued that traditional tenures should not be evaluated on their ability to facilitate increases in pecuniary wealth, because quite often such tenures produce important forms of non-pecuniary wealth (for example wealth redistribution, risk-sharing, etc.). However, Johnson (1972) argues that its possible to realign tenures to facilitate wealth increase and still provide the desirable social functions of traditional tenures.

for determining tenure sizes are employed, policy-makers often have to consider whether the size is sufficiently big to sustain the livelihood of a household. A related consideration is equity. Policy makers may willingly sacrifice economies of scale in a bid to ensure that every household has at least some agricultural land, no matter how small. Such considerations may become important in cases of high demand for land and limited supply, as is the case in many communal areas of Zimbabwe.

Transferability

Transferability refers to the ability of a resource owner to sell, bequeath, or gift an asset (including the benefits generated by the asset) to others at mutually agreed upon terms (Ault and Rutman, 1979; Pejovich, 1990). Asset or resource transfer can take the form of a sale or lease , for example, sale or lease of agricultural land or the sale of forest products. Asset transferability can range from a complete transfer (e.g. land or fruit sales) to short term leases of agricultural land with or without the approval of the community. The degree of transferability may vary with the nature of the resource in question. For example, while households may collect wild fruits for subsistence use and for gifts, quantities may not be collected for sale. Alternatively, households may only be allowed to lease agricultural land if the parties involved in the exchange of rights are from the same village.

Transferability allows resources to move to their most productive use and enables tenure holders to capture the wealth held in land and other land-based assets in several ways (sale, lease, etc.). Accordingly, restrictions on transferability reduce the value of assets/ resources. When transactions are limited, say to members of the same village, this reduces the effective market in which asset owners can operate, and the returns that can be had from exchanges are lowered. Restrictions on land sales increase the supply price of loanable funds for those whose collateral is land, and the collateral value of land may tend to zero if land sales are absolutely prohibited.

Sometimes society may willingly choose to forego the benefits of unencumbered transferability in preference of other benefits that arise from restricting transferability. The most commonly cited benefits of restricting the transferability of tenures concern land allocation and distribution issues, for example, the need to

avoid concentration of land and other resources, to avoid the creation of landlordism[8], and to avoid large proportions of land going to outsiders/ foreigners. It has been argued that concentrated ownership of the land base or control by outsiders/ foreigners may affect the ability of locals to earn a livelihood thus adversely affecting local quality of life (Fortmann, 1996), and sometimes may lead to social and political instability. For example, the concentrated ownership patterns and increasing population levels in Zimbabwe has sparked illegal settlement of state lands by landless people.

Fees

Fees may be payable by households growing and/ or harvesting agricultural crops or forest products. For example, persons who wish to collect and sell fuelwood may be required to purchase a permit. Fees may be paid in cash or in-kind (e.g. a proportion of the harvested agricultural or forest product). The payment of fees, and other conditions for use of resources that may be imposed on tenure holders are cost increasing, and thus reduce the amount of benefits that can be captured by the tenure holders. However, charging fees to resource users provides a mechanism for society to capture resource rents.

Operational Requirements

Society may require that resource users adhere to certain regulations during the use of an asset, for resource management, and in their harvesting practices. Such restrictions may be designed to ensure that management and harvesting practises are consistent with society's goals. For example, households may be required to destroy cotton stubble by a given date, for purposes of disease control.

Operational requirements limit right holders' flexibility to make decisions, thus affecting their ability to enhance the value of the resources. However, sometimes social and private goals diverge, and operational requirements/ stipulations provide a way to ensure that tenure holders pursue socially acceptable goals.

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[8] The classic argument against landlordism is that landlords charge too high rents. Johnson (1972) argues that the high rents charged by landlords reflect high costs for transactions between tenants and landlords as a results of tenure rules that restrict transferability of property rights.

Operational Control

The process of defining property rights is not complete if there does not exist mechanisms for enforcing the conditions of tenures (Bromley, 1991). Operational controls are the mechanisms for enforcing the conditions of tenures. Such mechanisms may involve policing by appointees selected by villagers, and a system of penalties against those who break the rules. Operational controls provide incentives for households to abide by the operational stipulations. If there is a high chance that those who break tenure rules will be caught and fined, households are likely to abide by the tenure rules. However, if there is no enforcement mechanism, or when monitoring is inadequate (or imperfect) there may be incentives for some households to break tenure rules in order to maximise their individual benefits while ignoring the negative impact of their actions on other households.

Operational controls impose costs on both the resource users and society. Society may have to devote time and resources for policing and enforcing the terms of tenure agreements. On the other hand, tenure holders may have to allocate some of their resources and time for keeping records of their activities and to produce reports for the regulatory authority. The existence of strong social ties, as is the case in many traditional societies, may produce conditions conducive for self-enforcing contracts helping to lower monitoring and enforcement costs.

Security

Security refers to the tenure holder's perception of the dynamics of property rights. As such, security is defined by the perception of a tenure holder concerning his/ her ability to capture benefits generated by the resource in the future, and whether changes in tenure will occur which increase or decrease the benefits which may be derived. This element of property is dependent on the socio-political environment in which the property rights are granted. High incidences of land disputes and past cases of usurpation by the government (without adequate compensation) can lead to high perceived property rights insecurity. Also, for those whose collateral option is land, insecurity may increase the supply price of loanable funds, which may lead to a reduction in investment (Feder and Onchan, 1987). Alternatively, there is the potential for a positive relationship between insecurity and investment, as households may invest in land developments in attempting to strengthen their property right claims (Kundhlande, 1997).

An often suggested way to reduce insecurity of property rights is by issuing title to land. However, differential access to information about land titling programs may lead to a transfer of wealth and land to some groups whilst depriving others of their customary access (Platteau, 1996). The negative impacts of insecurity on investment incentives may also be mitigated by provisions for compensation.[9]

4. Study Site and Survey Methods

The rights of households to land and natural resources in communal areas of Zimbabwe were examined using the above framework and the example of Jinga village in eastern Zimbabwe (Manicaland province). Jinga village is in Mutambara Communal Lands in Chimanimani district. According to the soil and rainfall classification of Zimbabwe, Jinga village lies in Natural Region 5[10]. The soils are shallow loamy sands and sandy loams derived from granite parent material. The average rainfall is 527 mm, barely sufficient to support rain-fed cultivation of drought tolerant crops like sorghum and millets (Campbell et al., 1997). The farmers in this area also keep cattle and goats which are grazed in the indigenous woodlands and the arable areas during the dry season. The vegetation in the area is predominantly mopane woodland (*Colophosperum mopane* with *Commiphora* and *Acacia* spp). Baobab (*Adansonia digitata*), which is generally found in mopane woodlands is also widespread.

Most households in Jinga village hold rights to four types of tenure - homestead land, agricultural land, garden plots and indigenous woodlands. Homestead land is the area where the household builds its houses and sometimes have "home fields". The garden plots may be located in the homestead area, close to river banks or boreholes. Gardens are important for vegetable production. Availability of a reliable water supply may allow households to produce a variety of vegetables all year. Every household in the village possesses agricultural land for food crop production. All households may have access to indigenous woodlands from which they may collect forest products or pasture livestock.

Four questionnaires were designed, one for each of the four tenure types. The four versions of the questionnaire were administered to three key informants that were chosen to represent the institutions involved in

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[9] For a review of issues associated with compensation, see Innes (1995).

[10] Zimbabwe is divided into 5 agro-climatic regions based on rainfall and agricultural potential. Natural Region 5 is the most arid of the 5 agro-climatic regions.

land allocation in Jinga village since independence (1980). This allows us to obtain information, from the perspective of the representatives of these institutions, on the effects, if any, of the transfer of legal authority to allocate land from traditional institutions to VIDCOs. The interviewees were the kraalhead (*sabhuku*), an aide (lieutenant) to the *sabhuku*, and a member of the VIDCO. The respondents were asked to describe the tenure conditions applying for each tenure type according to the framework described above. To investigate the dynamics of tenures, respondents were also asked to describe any differences in tenure rules before and after independence (1980), and any changes they anticipated to take place in the future (in the next 15 years). The survey was translated and administered in July of 1994 by one of the authors (Kundhlande) who is fluent in Shona, the local language.

5. Results

The responses received from the interviewees were similar in most cases. Thus, in reporting our results we only mention particular respondents when there are specific differences in responses.

Comprehensiveness and Exclusiveness

The number of resources and resource attributes that tenure holders have rights to varies between tenure types. Households may grow crops or trees (planted or natural) on agricultural land, garden plots and homestead land. On these tenure types, the household makes the decisions concerning planting, protection and harvesting. Benefits from crop production and from planted trees go to the household that controls the land. However, tree resources from indigenous trees may be used by any household. During the cropping season households may exclude other villagers from collecting fruits from indigenous trees if such access may result in crop damage. In such cases permission has to be sought to be able to collect fruit and other tree-based products. There was one minor inconsistency reported between the three interviews, in that the *sabhuku's* aide reported that everyone may enjoy benefits from all trees, planted or natural, on agricultural land, but that households have the right to exclude others from benefiting from trees located on the homestead or in the garden.

Crop stubble left in the fields normally becomes available for communal grazing unless the field is fenced using more permanent material like barbed wire, in which case the field remains closed off. However, if the

household decides to exclude others from its crop stubble, it will not be allowed access to crop stubble in other farmers' fields.

Households may pasture livestock in indigenous woodlands, collect any amount of fuelwood, poles, thatch grass, fruits and other wild foods for personal use. A permit is required (obtainable from the district council) for the sale of fuelwood and for harvesting commercial timber, but the rules are not clear with respect to the sale of poles, fruits, an other wild foods collected from indigenous woodlands. Baobab fruit is collected and sold at roadside markets, and in some cases, is trucked to markets to urban centers. Within the village, some households hire their neighbors to collect poles for a fee. Hunting for small game (rabbit, hare etc.) and birds in the indigenous woodlands provides an important protein supplement for many household in the communal lands, but it is illegal to hunt big game. Communal grazing areas and indigenous woodlands for different villages often overlap, making it difficult to exclude anybody from using the resources. Thus households from outside the village may collect tree-based products from indigenous woodlands just as households from Jinga may collect forest products from other villages' woodlands.

Any household may draw water from naturally occurring sources on all tenure types unless significant improvements have been made. For example, water sources like wells and constructed reservoirs are privately controlled. If there are minerals occurring on individually or communally held land, households may not exploit these resources without a special permit from the ministry of mines.

Use designation

Natural resources may be used for a number of different purposes, depending on the tenure conditions. In theory, agricultural fields, gardens and homesteads are to be located in low lying areas, while uplands are reserved for indigenous woodlands and grazing areas. However, as space runs out in the areas designated for homesteads, encroachment of indigenous woodlands is the only way by which new households (immigrants and newly married sons of the village) can be provided with land on which to build and cultivate. The *sabhuku's* consent must be sought before a new settlement is established.

Households may grow crops or trees (planted and natural) on their agricultural land, garden plots and homestead. However, planting trees on one's agricultural land would likely attract an investigation by the *sabhuku*.

Since agricultural land is normally allocated for growing crops for subsistence, a household which converts all its agricultural land to woodland is viewed as having no need for the land in the first place. According to village customs, land is allocated to households on the basis of subsistence requirements.

Most of the tree species used for afforestation and reforestation in Zimbabwe (mostly eucalyptus species) are not suited for the arid conditions of Jinga village. Thus, agricultural land is more likely to convert to woodland through natural regeneration of indigenous tree species. This is generally considered a sign of abandonment of the land parcel in which case the land reverts to the communal pool and becomes available for reallocation by the *sabhuku*[11]. On the other hand, a household may plant trees on its entire garden plot or homestead land[12].

Duration

Rights to indigenous woodlands are held by the village in perpetuity, while rights to agricultural land, garden plots, and homestead land are held as long as the household, or heir of the household, remains a resident in the village and continues to use its lands. When the household leaves the village its agricultural land reverts to the village's common land and becomes available for reallocation by the *sabhuku*. Primary rights to land are normally given to the head of the household and family members derive their rights through the primary rights holder.

Allotment type and Size of Tenures

Individual households are granted rights over a specified area for agricultural land, homesteads or garden plots. The average cultivated area for a household is about five (5) hectares, while garden size ranges between 0.25 hectares and 0.5 hectares.[13] Households may collect forest products as well as graze livestock over the entire

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[11] In the 1960s and early 1970s, the colonial administration coerced communal lands farmers into adopting modern farming techniques whereby the practice of leaving trees in fields was discouraged. This discouragement continued under VIDCOs when they were assigned the function of land allocation in the early 1980s. At present, many organisations working with communal farmers promote the conservation and other benefits (manure from leaf litter and shade etc.) of trees left standing in the field.

[12] Studies of tree planting behaviour of communal lands households indicate that fruit trees are generally preferred (Price, 1994; Watson, 1994).

[13] The size of cultivated areas is limited by the availability of good land, and by a lack of draft power and labor necessary to work the land. Garden sizes are limited by the availability of land with irrigation potential given local technology and infrastructure.

woodlands area belonging to the village. There are no quantity limits are imposed for the amount of forest products collected for personal use or for sale (provided the household holds a permit in the case of fuelwood sales).

Transferability

Household rights to agricultural land, garden plots, homestead land and indigenous woodlands may not be sold to other households. Agricultural land (and in some cases garden plots) may be leased as long as all parties involved are from the same village. Typically lease agreements involve a one time payment in return for the use of land over one or more growing seasons. The *sabhuku* reported that past incidents of land disputes concerning leasing of agricultural land has prompted village authorities to discourage the practice.

Agricultural land, garden plots and the homestead may be partitioned and allocated to any member of the family without necessarily seeking approval of the village authorities. However, it is customary to inform the *sabhuku* of such matters. On the other hand, gifting away of land rights to outsiders requires consent of the family and the approval of the village authorities. Although rights are assigned to a primary holder, usually the male head of the household, upon death of the primary rights holder, all the rights can be inherited by his heirs (male or female). Either a successor may be chosen and takes over the entire estate (including land) of the deceased rights holder (normally with responsibility for other family members) or the estate is parcelled out to each surviving member of his family.

Households are allowed to sell most tree-based products growing on their plot except t*sikiri* (*Trichilia emetica*) which is considered sacred[14] and must have its use mediated by the village's religious leaders.

Fee Payment

If any member of the village wishes to sell fuelwood collected from indigenous woodlands, they pay a fee to the rural district council in order to obtain a permit. Otherwise no payments are required from households for collection of fuelwood or other forest products from indigenous woodlands for personal use, and for use of

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[14] The cult of the ancestor is very much a factor in Jinga village and is deeply rooted in the land of the lineage. It is believed that ancestors continually intervene in present day human affairs. For example, it is believed that ancestors influence the fertility of the soil, rainfall and during droughts they make certain fruits (e.g. t*sikiri*) available allowing villagers to ward off starvation.

agricultural land, garden plots, and homestead land, or the sale of crops and tree-based products grown on these tenures.

Operational requirements

Some operational requirements apply for harvesting, management and protection of both forest products and agricultural crops. There are various regulations and taboos specifically meant to regulate the use of the community's resources. Such regulations typically apply to hunting, the collection of certain fruits, the use of certain pools of water, tree cutting, and the way various agricultural operations are carried out. For instance, with respect to performing agricultural tasks, the first Thursday of every month is considered sacred (*chisi*) in Jinga, and no agricultural work may be performed during *chisi*. It is believed that the village's ancestors ("owners of the land") bless the village's agricultural fields on *chisi*. Performing any agricultural tasks on *chisi* is thought to interfere with the ancestors. Harvesting of sorghum and millets (the major grain crops in Jinga village) may only commence after "thanksgiving" ceremonies (to thank the ancestors for the harvest) conducted by village's religious leaders and elders. With respect to hunting, the killing of certain animal species, for example the pangolin and python, is prohibited.

There are rules relating to the harvesting of tree- and forest-based products. For example, only dry wood may be harvested for firewood, and individuals may only cut those trees they intend to use. With respect to fruit collection, lopping tree branches in order to collect fruits is prohibited. Only the fruit may be picked from the tree without damaging the tree itself.

Some rules apply for the management of both crops and tree-based products, for example, households may not use any poisonous substance to protect crops and fruits against wild animals and birds. For example, poisoned bait for baboons is prohibited. Not only is it illegal (in statutory law), but it is also believed that sometimes the village's guardian spirits reside in wild animals.

In Jinga every village resident has the right to pasture livestock on village pastures, but residents must follow regulations restricting where they can graze their animals at different times of the year. During the cropping season, livestock have to be pastured in the uplands to avoid crop damage that may be caused by stray animals if they are pastured close to the fields. Someone has to look after the cattle, goats and sheep, and livestock must be

penned at night. After the harvest, livestock are allowed to graze on crop stubble left in the fields. During this season, it is not necessary to have somebody watching the livestock, and livestock do not necessarily have to be penned at night.

Operational Control

The regulations and taboos that help control resource use are generally respected because they come from ancestors, and misfortune befalls anyone (including his or her family, and sometimes the whole community) who breaks the rules. Failure to observe such rules is considered a serious offence, as such sacrilege may invite the wrath of the ancestors on the entire village. The ancestors' punishment for the village may be by way of a bad harvest in the future, crop pest invasions, etc. The prospect of inviting bad fortunes to the whole village because of one's bad behavior produces effective collective pressures on individuals to conform to regulations. The people in Jinga have also devised other mechanisms for enforcing resource use rules. The *sabhuku's* lieutenants and other appointed representatives monitor compliance with the rules governing management, harvesting and protection of crops and tree based products. Other resource users (residents of the village) may also report any offenders to the village authorities (*sabhuku's* lieutenants, *sabhuku* and members of the VIDCO). Sometimes a warning to first time offenders suffices depending on the gravity of the offence[15], but a fine of one chicken delivered to the *sabhuku* may also be levied. For repeatedly breaking the rules or when a major offence has been committed, the offender may be asked to brew beer which is drunk by members of the village during rituals involving pouring of the libation over the land to appease the spirits[16]. There is very little reliance on external authority to enforce resource use regulations. The few exceptions include the case of rules against streambank cultivation which are enforced by government officials (the Department of Natural Resources), and against hunting of big game which are enforced by the Department of National Parks and Wildlife with the assistance of the state police.

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[15] Cutting down a fruit tree would be considered a less serious offense, while failure to observe *chisi* is regarded as a major offense.

[16] This penalty is considered appropriate because breaking major rules regarding use of land and resources is thought to invite the wrath of the village's guardian spirits on all in the village.

Security

Although all respondents acknowledge the existence of the indigenous land tenure institutions and the VIDCO system, respondents reported that in practice there were no significant changes in tenure rules between the pre- and post-independence periods. Neither did the respondents think significant purposeful changes to tenures were likely to take place in the future (15 years from today). However, all respondents expressed the view that with increasing land shortages as the population grew, households will likely move towards more private control of land and natural resources.

6. Discussion of the Results

Despite the use of the term “communal areas”, to describe a tenure situation in Zimbabwe, it is apparent that there is a large range of exclusivity associated with various resources under these jurisdictions. Some resources, such as gathered wood products and grazing in woodlands, appear to be exploited as open access resources, where there are no clear boundaries for any one village’s indigenous woodlands and grazing areas. However, permits are required for collecting resources for commercial sale thereby providing some measures of exclusion. For other types of resources, such as agricultural products and in some cases trees, rights may be held exclusively by households.

Despite some misnomers associated with the title “communal areas”, many authors have recognised distinctions between “communal woodlands” and agricultural land holdings. However, using the above framework, key differences between, agricultural lands, garden plots and homestead lands, can be identified. Sizes of allocated agricultural lands tend to be larger than garden or homestead plots, and may be sub-let to other parties more often than the smaller parcels. Furthermore, use designations restrict the planting of forests on agricultural lands, while garden and homestead plots may be comprised solely of trees.

The above description also discloses that there is more than just tree tenure and land tenure. There is also, at a minimum, crops tenure, water tenure and mineral tenure. Indeed, if the social conditions relating to the many types of natural resources are accounted for using concepts of individual resource tenures, the general concept of land tenure has little left to describe, as rules are quite specific to each resource contained on, above, or under land.

The above results also show how incentives created by tenures may be extremely complex. The behavior of households is likely to be influenced by the specification of all characteristics described above, rather than just the concepts of exclusiveness and security that seem to dominate the literature. While it is beyond the scope of this paper to attempt to specifically identify a behavioral model, some immediate behavioral consequences of tenure structures in Jinga are evident. In particular, if tree planting is to be promoted, it is likely heavily dependent on the potential within garden plots and homestead plots, as the planting of trees on agricultural plots may be restricted.

Finally, the evolution of tenure seems to be fairly robust to outside influences in the case of Jinga village. Despite official transfer of authority in matters of land allocation from traditional leaders to VIDCOs, communal resources continue to be managed by indigenous institutions. In Jinga village, members of the newly-created institutions and traditional leaders have found ways to co-operate and produce a single line of authority for land allocation. Many rules regarding resource use relate to, and are sanctioned through, religious practises, and many people continue to hold land under this system. Therefore, it does not appear as though institutional weakening has lead to resource degradation.[17]

Despite the apparent stability of the institutional controls over resources, degradation seems to have nonetheless occurred. Campbell et al. (1997) report that resources availability in Jinga has decreased over time. Therefore, whereas the lack of institutional change may be interpreted as a secure tenure system, it may also be viewed as a tenure system that has failed to adopt to changes in social pressures. It may be that traditional institutions have not been able to adjust tenures to accommodate population growth, changing technology and fluctuating market conditions (Dasgupta, 1993; Dasgupta and Maler, 1993, 1997).

7. Conclusions and Further Research

Viewing property rights as characteristics provides a flexible approach that may avoid some problems which have been caused by historically rigid interpretations of tenure. First, the historical tendency for property rights to be described and analyzed using terms such a “public vs. private” or “common” property may be avoided.

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[17] This is not to suggest that institutional vacuums do not lead to resource degradation. There is evidence that in resettlement areas, and in protected areas where households are illegal “squatters”, a lack of institutional control may lead to resource degradation (Goebel, 1997; Matose, 1994)

The above characterization of property rights blurs the distinction between public and private property. Indeed, Alchian and Demsetz (1973) point out that whether enough rights have been transferred from private to public control to constitute public or private property is a moot point. Likewise, it is also limiting to characterize property rights issues in terms of common vs. private property. The degree to which property is held communally, or the exclusiveness of property, is only one of many property right characteristics. Furthermore, the distinction between "land and tree tenure" is no longer problematic if aggregate labels are abandoned in favor of a framework such as is identified above. The characteristics of comprehensiveness and operational stipulations are flexible enough to allow for different resources on a given piece of land to have different sets of rules.[18] Accordingly, the use of such characteristics enable a more general concept of "natural resource tenure".

The taxonomy presented above could also provide a thorough and consistent means with which to compare and contrast different types of tenures. With the absence of a defined framework within which to describe property rights, descriptions have been hap-hazard, and comparisons difficult. Accordingly, it is difficult to tell from the existing literature to what degree tenures across Zimbabwe are homogeneous or heterogeneous. Along these lines, it is difficult to know how communal areas will be affected by high level policies that influence large areas of tenure systems.

Thinking of property rights within the above taxonomy also focuses attention on the complexity of the tenure environment in which management decisions are made. Although the field of environmental economics has paid much attention to regulatory tools (such as taxes and standards), and the concept of exclusiveness, other aspects of tenure incentive frameworks have received little attention. Some have speculated on the effects of other individual tenure characteristics on economic behavior (e.g. Pejovich (1984) on the duration of tenure; or Pearse (1976) on the transferability of tenure). However, there has been little progress made towards developing theory to explain behavior in the simultaneous presence of several interrelated tenure characteristics.[19] The approach

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[18] The characteristics are also sufficiently general to capture a number of socio-economic phenomena which may be related to management behavior. For example, variations on transferability can be interpreted to encompass gender issues caused by differences in rules regarding inheritance and disposition of assets in the event of divorce (Hansen 1998).

[19]Nautiyal and Rawat (1986) investigate the effects of duration and security of renewal on investment decisions, but their analysis does not address the funding mechanisms used to induce silvicultural investments. Luckert and Haley

outlined above may lead to a more general and solid theoretical foundation for empirical results. According to the above framework, virtually any policy tool may be portrayed as a variation in property rights. For example, analyses of the economic incentives of private firms need not be limited to the effects of regulatory actions such as taxes and standards. Instead, such traditional economic variables may be considered as one of many social conditions placed on using an asset or service. Theory that has already been developed with regards to individual characteristics could be used to construct more complex incentive frameworks with various specifications of the above variables. Although the incentives created by multiple interdependent variables has proven difficult to specify, using simulations to predict management behavior appears to be a promising alternative approach.[20]

Although the above framework may prove useful in conceptualizing and developing theory regarding tenure issues, empirical problems are likely to persist. By acknowledging the complexity of tenures, identifying empirical relationships between tenures and behavior becomes more difficult. A greater number of potential right hand side variables, in the midst of numerous necessary ecological and non-tenure socio-economic controls, can create intractable empirical problems.[21] Solutions to such problems will likely come from searching for case studies where the majority of tenure variables are held constant, such as within a given village, while variations in individual tenure characteristics may exist between households or individuals.

Finally, a few problems with the above taxonomy should be noted. To begin with, the taxonomy was constructed based on economics literature with the purpose of better understanding management decisions of households. Accordingly, the above taxonomy could be enriched by adding characteristics that have shown to be relevant in other disciplines. Along these lines, there may be a number of characteristics that maybe added to better explain how and why tenures evolve.

(1990) describe incentives created by variations in funding mechanisms, but their descriptions lack the rigor necessary to hypothesize specific results from specific policies.

[20]For example, Luckert (1998) has developed theoretical models based on Monte Carlo simulations to explore the incentives for silvicultural performance provided by several tenure characteristics, simultaneously.

[21]This is likely another reason why most empirical investigations to date have treated tenures as an aggregate dummy variable rather than dissecting tenures into their component parts.

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