

PRIVATISATION OF RANGELANDS, RANCH DEVELOPMENT,
MANAGEMENT AND EQUITY: THE CASE OF AREA 4B,
BOTSWANA

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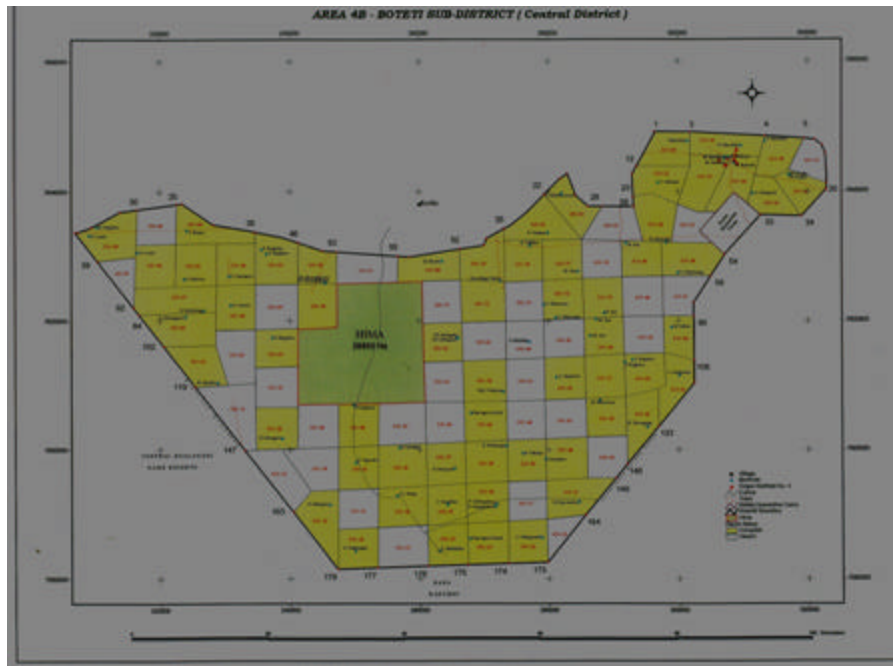
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Privatisation of rangelands, ranch development, management, and equity
The case of Area 4B in Botswana

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Title picture: Map of Area 4B (courtesy of Ngwato Land Board)

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Declaration

I, Kgomotsego Motlopi, hereby declare to the senate of the Norwegian University of Life Sciences (UMB) that this thesis is a result of my own research work. Any material that is not mine is duly acknowledged. It has not been previously published or submitted elsewhere for award of any academic degree.

Kgomotsego Motlopi

Ås, May 2006

Dedication

This thesis is dedicated to,
My Parents, Oagile and Barbara Motlopi.... I remain grateful to you

My bothers I will always love you

My son, Lefika Theo You make me smile.

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Abstract

Botswana has an entrenched negative attitude that associates communal rangeland ownership and management to inefficiency and rangeland degradation. Thus a number of land reform policies that promote conversion of communally held rangelands to private ownership (associated with increased productivity and protection of range resources) have been and are being implemented. The study was conducted in Area 4B, a block of privately owned ranches in Central Botswana. The study administered questionnaires to ranch owners and collected primary data and secondary data from informal discussions with officials; cattle post owners and other key informants. The extent of infrastructural development in these ranches is evaluated using respondents' wealth, income, education Livestock numbers and main economic activities. Ecological variability is also used in the analysis elucidate reasons for continued practice of traditional management methods in the private ranches. The empirical results indicate that development statuses are very low and ranch development is driven by both socio-economic and environmental factors. Absentee ownership is widespread. Indications are also that the process of ranch allocation, which is determined by personal attributes, affords the wealthy opportunities to alienate the poorer members of the economy, resulting in socio economic inequalities. The concentration of government in allocating private rights, as a way of improving productivity and environmental protection is flawed because it emphasises economic gains over social equity issues. It ignores evidence that communal rangelands are multi functional and a source of livelihood for highly differentiated resource users. The under-development of allocated ranches suggests that there are issues more urgent than holding title to land.

Key words: privatisation, infrastructure development, social equity, livestock production, Mobility, ecological variability, Borehole grantees, new occupants, Area 4B, Botswana.

1 INTRODUCTION

The rangeland resource in Botswana forms the base for livestock production system, it constitutes the most important means of survival for the major part of Botswana population (Shanmugaratnam et.al 1988). However the ability of these rangelands to support higher populations is being undermined by introduction of private property regimes. Botswana has an entrenched negative attitude that associates communal rangeland ownership and management to inefficiency and rangeland degradation (Makepe 2006, Perkins 1996, Peters 1994). This attitude has resulted in a number of land reform policies that promote conversion of communally held rangelands to private ownership, presumably to increase welfare among pastoralists. However this push for privatised rangeland rights undermines the complex manner in which rights to land are distributed in communal rangelands. Communal rangelands are characterised by overlapping rights and growing privatisation only allocates rights to one whose rights are clearer/favoured and increases his/her privilege at the expense of other right holders, the rights that are usually respected are those of the elite (Cullis et al. 2005, Cotula et al 2005, Taylor 2001). These complexities make communal ownership regimes relevant in environments with varied resource base and user groups (McKean 2000). While the need to increase efficiency, enhance incentives for investment and create incentives to protect rangelands is appreciated, it can be misleading to equate titling to investment and environmental protection. There are other issues that determine investment than tenure security (Meinzen-Dick 2002). It is therefore important to understand that links between property rights and innovation requires looking beyond 'ownership' as defined by government title (Meinzen-Dick et al., 2002). Benjaminsen et al (2006), argue that policy makers tend to be drawn towards standardised and one-size-fits-all solutions to perceived inadequacies in local tenure systems. Despite reports that allocation of private rights in Botswana has not resulted in improved production or rangeland management (Perkins 1996, White 1993), the negative attitude towards communally held rangeland is rife.

Policy makers treat 'inefficiency' and 'degradation' as technical problems of the communal system to be solved by introduction of borders and definition of rights through private ownership. However this attitude is flawed, because it makes assumptions about the motive/ characteristics of beneficiaries' ability to engage in commercial production; commercial undertakings require high investment costs and commercial livestock production is no

exception (McKean 2000). A study of ranches in the Kgalagadi district established that ranch leasees did not associate fencing and paddocking of ranches with improved livestock management, but rather saw these as means of preventing loss of stray cattle (Thomas et al. 1997). The concern with productivity at the expense of livelihoods security and equitable distribution of resources is unfortunate for a state that has responsibility to the welfare of its citizens. The attitude also ignores evidence that Botswana is a semi-arid fragile ecosystem that may impose great uncertainty on the productivity of any particular section of the system (Abel et al. 1989). The location of the unproductive sections varies unpredictably from year to year, although the productivity of the entire area may be stable for longer (McKean 2000). The significance of beef as an export commodity is used to undermine the equity element central to communal production and management of rangeland (Cullis et al. 2005)

This study examines the level of development and management in the privately owned ranches of Area 4B in Central District (Figure 1). These ranches were allocated in the year 2000, in previously open communal rangelands; they have an average size of 3600 hectares. The ranch sizes are based on potential carrying capacity calculated for the entire ranch area. The research is expected to add to the current debate on the pros and cons of privatization of the communal rangelands in semi arid environments such as those of Botswana. The research provides a critique to the process through which privatization is being implemented. It looks at the socio economic characteristics of the beneficiaries, the differences in the development statuses of their ranches and uses these analyses to support arguments against privatisation and explain why there are little commercial ranch development activities. It is therefore important to understand the history of privatization policy in Botswana in order to fully appreciate the discussions that follow.

1.1 Background

The seeds for privatization in Botswana were sown in the 1930's when Tswana cattle farmers invested in borehole technology, which alleviated overall water scarcity and reduced seasonal fluctuations in water supply (Peters 1994:viii). The allocation of borehole rights to individuals raised new issues of access and management entirely affecting property relations over water and pasture. These were later precipitated by the 8km distance rule between boreholes (Perkins 1996, Peters 1994, White 1993). The grazing areas around these boreholes began to be associated with borehole owners, creating de-facto rights to grazing (Perkins 1996). The government of Botswana, with development aid from the World Bank, undertook its first

Livestock Development Project (LDP1) in 1973, followed as an attempt to demonstrate the commercial benefits of fenced ranches as an improved management technique (Cousins 2004, Peters 1994, White 1993, Shanmugaratnam 1988). The project was reportedly a failure because it was implemented in an area where transport, telecommunications and technical staff were not easily accessible and government failed to control stock numbers within ranches (Shanmugaratnam 1988). The above, coupled with absence of full time resident managers, constrained effective management (White 1993) and the expected transformation from cattle post managers to modern ranch managers was never realised.

As a sequel to the LDP1, Tribal Grazing Land Policy (TGLP) was introduced to tackle the issue of poor livestock productivity in communal areas and the alleged overgrazing due to growing livestock herd size on a relatively dwindling resource base (Adams et al. 2003, Thomas et al. 2000, Tsimako 1991, GOB 1975). The TGLP was also to address the issue of social equity by offering the large herd owners, those with over 400 animals, an opportunity to move out of communal areas (GOB 1975). The remaining herd owners would then have more room for their livestock. However this was not realized as after utilizing all the resources in their farms, large herd owners could still revert to the communal grazing area (White 1993, Tsimako 1991, Shanmugaratnam 1988). This created an unfair 'dual grazing rights' system, where farmers who enjoyed exclusive rights in their ranches could still legally claim their community rights to graze in the communal rangeland which further accentuated land pressure (White 1993, Shanmugaratnam 1988). The disparities that were to be addressed to reduce the differences between the rich and the poor were never attained and access to resources was curtailed (Perkins 1996). It is now widely accepted that the objectives of TGLP have not been attained despite the credit facilities and advice that accompanied the allocations (Cousins 2004, Peters 1994, Tsimako 1991, Shanmugaratnam 1988).

Despite controversy and negative policy review of TGLP, the government of Botswana has since 1991, called for alienation of more communal rangelands, under the National Policy on Agricultural Development (NPAD). Apparently, the government of Botswana still believes that privatization is still a solution to improve productivity and rangeland problems (Cullis et al. 2005, GOB 1991). The new policy has several objectives;

- Providing adequate and secure livelihoods for those involved in agriculture
- Increasing agricultural productivity

- Increasing food self sufficiency
- Conserving agricultural land resources
- Meeting the employment demands of a growing labour force

The policy emphasizes the need to address the problem of low productivity of the livestock sector. The issue of land (mis)management is highlighted and the suggested solution is to “allow farmers, where feasible, to fence livestock farming land either as individuals, groups or communities to improve productivity of the livestock sub-sector”. The NPAD states that “through fenced grazing areas individuals or communities will be able to control stocking rate, disease and plan better their breeding and marketing programmes” (GOB 1991).

The NPAD emphasizes that availability of livestock water will be a prerequisite for fencing, therefore those presently with water rights in communal grazing areas will be given priority to fence areas around their water source for exclusive use (GOB 1991). The policy makes no mention to ban dual grazing rights. The growing commercialization and continued privatization of rangeland in Botswana is supported by the European Union. First after 1972, Botswana beef obtained preferential access to European markets as well as subsidies by signing the Lome Convention (Cousins 2004, White 1998a, Perkins 1996). The European Union has of recent demanded that they want to know where their beef is from, i.e. a trace back system; this can only be done effectively in enclosed systems.

1.2 Rationale of the study

When ranches are created they take away large tracts of land from communal ownership and management and convert these to private ownership and management. Those who qualify either through existing water rights in the area or ‘prove’ ability to undertake ranch developments are the beneficiaries. Ranching as an economic activity creates social costs as well as benefits. The theory is that the benefits of ranching must be able to compensate for the social costs it generates. However the realisation of this is questionable, given the slow ranch developments by their owners after allocation. The NPAD clearly states that fencing should only be undertaken where it is feasible, that is, where land use is predominantly livestock grazing, with existing boreholes and strong local willingness to fence. Therefore feasibility studies precede all demarcations (GOB 1991). However, the slow ranch development in most areas where fencing is being undertaken, point in the other direction. Ranches have been

allocated, but developments are not forthcoming. What did the planners miss? If there is such strong willingness to fence, what issues are stalling the ranching development process?

This study is not in any way intended to advocate for the dismantling of existing private rights but seeks to provide empirical evidence that would contribute to halting of current progressive privatisation. It offers government reasons for useful self reflections, which may lead to development of policy reforms that may be exercised on the remaining communal rangelands. Such reforms may include changing the management of range resources from the current open access to common property regimes (how this can be done is a matter for another study). Academics are expected to benefit through additional dimensions to the overall privatisation debate that emphasises more on ability of ranch beneficiaries to develop such that the expected management practices are implemented. Ranch development statistics for the new ranches, like the TGLP ranches, show that enthusiasm among ranch beneficiaries is non-existent, there are few ranch developments taking place and lease uptake is slow, denying the Land Board rental income (Monageng pers. com. 2006).

Although there is much literature on the effects of privatisation, the focus has been more on environmental effects and economic production. These studies have always pointed out that production and infrastructure in private ranches was not very different from that in the communal rangeland, none sought to expound on the observation. The observed shortcoming in the literature to date is failure to incorporate ranch owners' socio economic characteristics, to explain observed unresponsiveness to commercial farming. The ranch allocation in Area 4B started in the year 2000. Since it might be early to judge, the process of development in these ranches, an attempt is made to map out the general picture.

1.3 Research objective

The research aims to determine the level of ranch development, and the relationship between ranch development and socio economic factors such as wealth, income, stock numbers, livestock numbers, management practices of the ranch beneficiaries, and environmental variability of the research area.

1.4 Research questions

1. Is the process of private rights allocation equitable?

2. Has there been a ranch development in the area? How much? By who?
3. Are there significant wealth, income, education and livestock differences between groups that own ranches?
4. What are the associations between ranch development status and socio economic factors (Wealth, Income, Total stock and cattle numbers)?
5. What kind of rangeland/livestock management exists in the area?
6. What environmental factors are important to ranch development?

2 THE PRIVATISATION DEBATE

Land is essential for generating livelihoods in most developing countries; it is used for wealth creation that can be transferred between generations (Deininger et al. 1999). Allocating exclusive rights to certain individuals' means that the multiple uses of rangeland which include equitable access, local peace, cultural identity, hunting and gathering, livestock keeping for milk and draft power and not simply beef production, are undermined (Cotula et al. 2005, Cousins 2004, Taylor 2001). The economic benefits that arise from these uses are often undervalued owing to difficulties in attaching monetary value (Cotula et al. 2005). Management of range resources has been a subject of much academic and political debates, these debates are between the proponents of individual management and the advocates of the traditional system of resource management, which emphasises community claims.

2.1 Arguments for privatisation

Arguments for private ownership are mainly economic, justified in terms of agricultural efficiency, growth and development (Arntzen et al. 1986, Ringrose et al 1986). Privatisation is hailed as a sure way of avoiding the "Tragedy of the commons" situation that allows farmers to expand herds without bearing the full costs of this (Hardin 1968). Individual farmers maximise their stock and gain all the marginal benefit (extra stock) while sharing the negative impacts (rangeland degradation and reduced grazing) or marginal cost that may arise with other herders (Makepe 2006, Sserunkuuma et al. 2001, Abel et al 1986). Therefore to avoid ruin to all, tenure reforms such as privatisation are seen as pre-requisites to agricultural development and environmental protection (Lane et al 1995, Bersely 1995, Ellickson 1993). For example in 1975 the World Bank through its land reform policy called for individualisation of communal tenure systems (Cullis et al. 2005, Deininger et al. 1999, Shanmugaratnam 1988).

Growing commercialization of beef and its significance as an export commodity has contributed to the transformation of communal ownership to rangeland monoculture (Anantha et al 1999) Governments encourage privatization in an attempt to move to a more market oriented production and make greater overall contribution to the national economy (Graham 1998). Exclusive rights to grazing are said to promote investment by making rights to land secure, they are intended to make ranchers better stewards of the land through providing motivation for owners to adopt conservative behaviour (Deininger et al.1999).

Arguments based on rangeland degradation and desertification theories are advanced to promote individualisation. Desertification is land degradation in arid, semi-arid, and dry sub-humid areas resulting mainly from adverse human impact (UNEP 1992). Desertification is presumed to result in a reduction in the biological and, hence, economic potential of the land to support human populations, livestock and wild herbivores (Arntzen et al. 1986). Animal husbandry, especially in the arid and semi-arid regions is considered the most essential human induced factor affecting desertification risk (Peters 1987). According to this view, the major concern was overstocking and its negative consequences on the environment (Peters 1987). The problem (too many livestock) had a technical solution (de-stocking). The concept of carrying capacity is central to these arguments (Anantha et al. 1999).

2.2 Arguments for communal rangeland management

The advocates of communal management argue that the premises that propelled privatisation of the commons are flawed in that they simplify communal management regimes and ignore complex stability and equity issues arising in tenure policy (Niamir-Fuller 1999, Perkins 1996, ILRI 1995, Scoones 1994, Behnke et al. 1993). The values attached to rangelands by different users for different rights are many and varied (McKean 2003) therefore complete understanding of the complex livelihood sustaining functions of communal rangelands is a requirement. For example in Malawi different rights held by men and women are said to affect incentives for forestry and agroforestry, while in Syria rights to tribal communities play a key role in rangeland management (Meinzen-Dick et al. 2003). They observe that semi arid and arid environments are not stable and therefore are non equilibrium ecosystems: rangeland conditions are determined by external factors such as rainfall, not human activities (Niamir-Fuller 1999, Arntzen et al. 1996, Scoones et al. 1994, Behnke et al. 1993). Communal management is should be admired for its allowance of flexible livestock movements in response to variations in rainfall patterns (Perkins 1996, Niamir-Fuller 1990). This opportunistic management strategy allows cattle owners to maximise production accordingly (Arntzen et al. 1996, Graham 1988). Scoones et al. (1994) use this observation to conclude that, since different areas have different things to offer at different times, the ability for cattle owners to move around the rangeland is vital. Free livestock movement over large areas has been associated with ecosystem health, as it allows vegetation to recover between grazing events (Perkins 1996, Behnke et al. 1993, Graham 1988, Ellis et al. 1988, Cousins 1987). Under communal rangeland management key grazing areas are available, allowing herders to

select favourable ranges to bring their animals in times of stress, like low rainfall, fires outbreaks and drought. The same cannot be said about the small parcels of land that constitute private farms, where mobility and flexibility is non existent and stock is concentrated in limited grazing areas, which may not contain the needed diversity of resources (Niamir-Fuller 1990). The effect of parcelling land in this way increases stocking rates in the remaining communal land, effectively compromising ecosystem resilience (Perkins 1996, Cousins 1987).

These diverse management techniques enabled pastoralists to cope with eventualities. In the communal system livestock owning families often have a network of contacts throughout the region, therefore the cattle post system is not static (Perkins 1996). In china a form of privatisation using the pasture contact system reflected that privatisation was not viable in an area where extensive livestock production was undertaken (Ho 2003). Ho explains that this was due to high transaction costs required to make privatisation possible and the necessity for mobility in order to cope with risks. The complex forms of social organisations provided security and support systems (Niamir-Fuller 1990, Graham 1988). With the establishment of private farms, these social ties are expected to break and make coping difficult. The decline in traditional and extended family links increases inequality. This inequality manifests through exclusion of poorer pastoralists who lack the means to persevere, in face of adversity (Perkins 1996, White 1993, Graham 1988). Shanmugaratnam (1988:8) argues that with the introduction of privatisation and the scrapping of resource allocation powers of the chiefs the areas that are left after the slicing and fencing of rangelands have resulted in a progressive breakdown of traditional cooperative, regulatory institutions that governed access rights to grazing land leading to an institutional void. Infact, cases where state formalisation of tenure reduced tenure security by weakening social institutions without replacing them with effective state institutions are reported in Haiti and Syria (Meizen-Dick et al. 2003). However in Ethiopia state institutions could only enforce policies restricting individual and community rights (Ibid). In Botswana the amendment of the Tribal land Act of 1968, changed the common property arrangement system to open access as rights of tribes were abolished and access has become open to all citizens of Botswana regardless of tribe.

Individual ranches are supposed to be operated under strict maximum stocking rate obligations for sustainable use of resources; however the relevance of any carrying capacity estimate under highly variable climatic conditions such as those of Botswana has been

questioned (Benjaminsen et al. 2006, Scoones et al. 1993, Behnke et al. 1993, Graham 1988), they argue that fixed carrying capacity does not apply in areas with varied resources availability at different times of the year and from one season to the next. Some authors point out that the enforcement of stocking rates has been difficult (Perkins 1996, Graham 1988). One issue that is closely linked to this is that of the actual practice of such measures, for example, The Issues Report reports that private farms have not resulted in superior land management, with ranches being run in the same way as the communal system (GOB 2002, Perkins 1996). The failure of privatization in areas where it was practiced is said to illustrate the weakness of the tragedy of the commons approach to the perceived problems of pastoral development (Lane et al. 1995).

Privatised management involves high transaction costs and is thus an expensive venture. The high investment costs of operating a ranch (borehole drilling, perimeter fencing, paddocking and water reticulation) skew beneficiaries towards wealthy farmers (Cousins et al. 2004, Peters 1994, White 1993, Oba 1990). Bromley observes that leaving the land resource to the market as is done through privatisation involves externalities and wealth effects that will differ considerably as one party buys out the right of another to use the resource (1991). The Botswana Land Policy Review Issues Report has observed displacement, with an increasing number of people owning no livestock, and argues that the displaced populations have effectively lost their means of living and this has very high cost implications for the government (GOB 2002). The argument is that the scope of possible economic actions of the ranch beneficiaries may become widened, but the opportunity of the dispossessed populations to earn a living through livestock would be reduced or taken away (White 1993). The critics go on to say that the possible beneficiaries' of privatised land would be wealthy individuals or those with alternative income sources (Cullis et al. 2005, Perkins 1996, White 1990.)

3 DESCRIPTION OF THE STUDY AREA

3.1 Selection of the study area

The study was carried out in Central district within Area 4B ranches. These ranches occupy grazing areas belonging to the villages of Mopipi, Mokoboxane and Kedia. The above mentioned villages form one group of three pilot sites for the implementation of Indigenous Vegetation Project (IVP) in Botswana. IVP is a demonstration programme for biodiversity conservation and dry-land ecosystem restoration in arid and semi arid zones of Africa. Participating countries are Botswana, Kenya and Mali. The focus of the project is to develop models for community driven management and rehabilitation of these ecosystems. Successful models will be replicated throughout participating countries. The project has six thematic areas of interest, the fourth of which focuses on improved livestock production, marketing and alternative livelihoods (UNDP 1997). This study falls within this thematic area. The Botswana sites are southern Kgalegadi, northern Kweneng, and Boteti. The reason that Area 4B was chosen for the study is that it is the only one within these sites where fencing of grazing lands under the National Policy on Agricultural Development had started.

3.2 Location

Area 4B is a completely enclosed ranch area in Central District, within Boteti sub district. It lies between two veterinary cordon fences of Setata in the south and south east and Mokoboxane to the north- west. The boundary to the north is Mopipi-Orapa road, while the western boundary is the Central Kalahari Game Reserve. The study area comprises of 97 demarcated ranches, however only 74 ranches had been allocated, while 4 were grouped to make 1 big ranch known as Hima, reserved for Remote Area Dwellers (RADs), 1 is a quarantine camp and the rest were under freeze because a water study project.

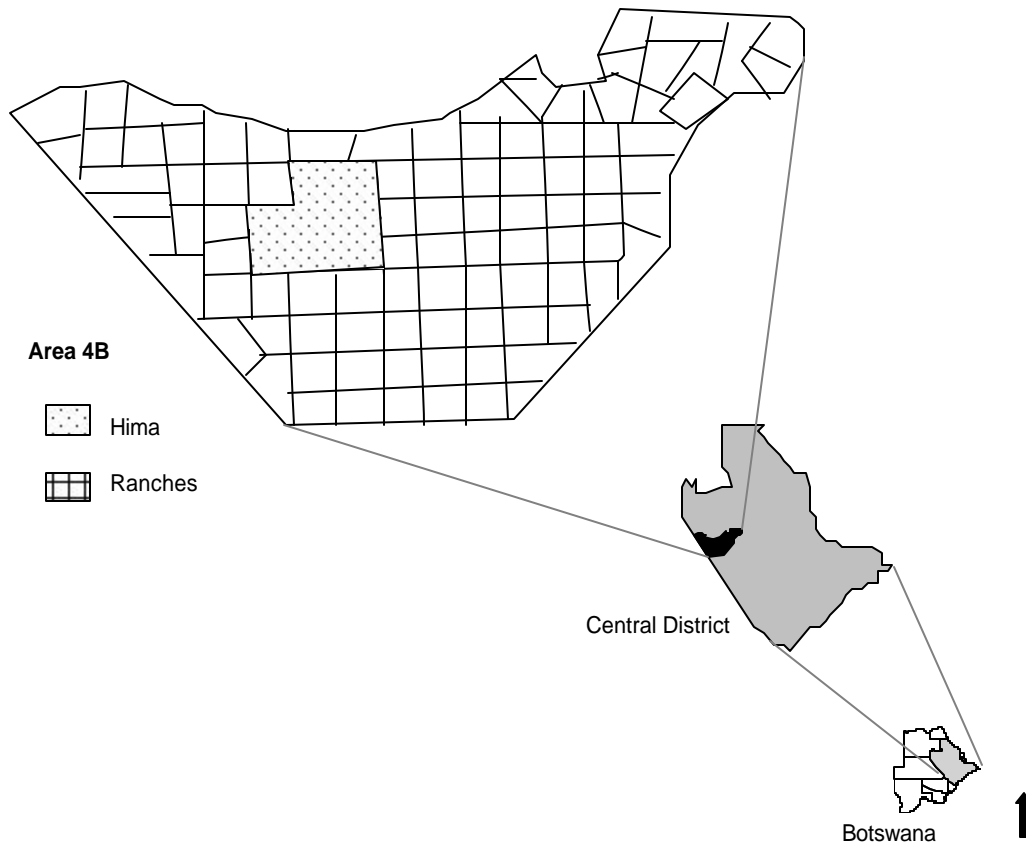


Figure 1. Study area locational map with detail of the ranch demarcations.

3.3 Characteristics of the study area

The entire area lies within the Ngwato Land Board administration, the Land Board allocates 50 year leases (titles) to all ranch owners within the study area. The study area is all grazing area with land divisions averaging 3600 ha. The soils are deep sandy soils, with a few units of clay. They are of poor fertility and are saline. The vegetation is characterised by tree savanna dominated by *Colophospermum mopane*. The area also has dwarf shrubs of Cmo with stunted growth. Some of the common trees and shrubs found in the area are *Acacia erioloba*, *Acacia leuderitzii* (mokgwelekgwele), *Acacia melifera* (mongana), *Boscia albitrunca* (motlopi) and *Grewiaflava* (moretlwa) (DOL 2000).

The main water source is underground water pumped from deep mechanized boreholes. The study area is covered by Ntane sandstone. Ground water in the Ntane sandstone is generally confined except where the rock is exposed or overlain by thin sandcover. Under the basalt

cover in the area south of Letlhakane fault, the underground water is under extreme high pressure and can rise 30 to 100 meters above the confining layer when a borehole is drilled. The possibilities of obtaining ground water are fairly good in piezometric surfaces from the confined sandstone aquifer. Ground water in the area is saline, with total dissolved solids (TDS) ranging from 2000 to 35 000 mg/ l. however on average the water is consumable by cattle (DWA 1998).

Local Community

There are currently no communities living within area 4B, it is a complete ranch area, separated from communities by veterinary fences. There are however communities in villages and settlements adjacent to the study area. Total population of the adjacent communities is 7 768 (IVP Inception Report) with 72% (5625) of the population being Mopipi residents, 17% (1338) being Mokoboxane people and 11% being people of Kedia. Kedia, which is 29km south – west of Mopipi, is a Remote Area Dweller¹ (RAD) settlement (CSO 2001).

Livestock farming is the main economic activity and predominant land use in the study area and its surrounds. Livestock farming represents an important source of livelihood for a significant proportion of households in the project area. Cattle posts are scattered around the research area, mostly where there is access to some supply of underground water. The rearing of cattle, small stock, horses and donkeys is widespread. Cattle owners are not always resident in the area where the cattlepost is located. Cattle are therefore taken care of by herders. Herding represents an important source of livelihood mainly for people of San origin, most of who reside in Kedia. An area of 29,000 ha within 4B area has been set aside for use by the RADS who have been affected by the establishment of ranches in area 4B. They derive most of their livelihood from the Government social welfare programmes such as the Remote Area Dweller Programme¹ (RADP), Economic Promotion Fund (provision of livestock and farm implements), and the destitution and orphanage programmes.

Livestock production is the main source of livelihood. However the area has a history of recurrent droughts. There is limited livestock market and this has resulted in high stocking

¹ Social welfare programme for people staying outside designated settlements, mostly comprised of the hunter-gatherer communities (san).

rates. The whole of the Boteti Sub-District is a declared Foot & Mouth Zone and is therefore a non-European Union Beef Zone. Farmers do not sell cattle to Botswana Meat Commission (BMC) as and when they want. There is a schedule provided by (BMC) on when and where they would buy cattle from farmers in this zone. Arable farming including dry land crop farming and flood plain or *molapo* farming (farming done along river boundary) is practiced to a lesser extent in Mokoboxane, Kedia and Mopipi. Due to the drying up of the Boteti River and long periods of drought, *molapo* farming is in decline and near impossible. The main successful crops planted in the project area are maize and melon.

Natural resources are viewed as an important source of livelihood particularly for vulnerable groups such as the hunter-gatherer communities. Availability of natural resources differs from one end of the project area to the other. The available veld products are seasonal and harvested during the rainy seasons. Veld products are mainly used to meet household needs (building poles, thatching grass, firewood), wild berries for consumption include *moretlwa*, *morama*, *morula*, *mogwana*, *mophane* worm, wild vegetables, roots and tubers. These veld products are sometimes sold for cash to generate income for buying other household needs. For example, wild fruits are processed into traditional brew (*khadi*), which is an important source of income for some families, especially the female-headed households. There are few wildlife species in the study area. Species that exist in the area include duiker, steenbok, gemsbok, ostrich, leopard, lion, wildebeest, hartebeest, kudu, hyenas, jackals, foxes, wild dogs and other small species (DWNP, office records 2000).

Outside the traditional livelihood activities, employment opportunities exist in all the three settlements through the Drought Relief Programme, and in shops and restaurants in Mopipi. Important formal employment for people in the Mopipi extension area is provided by Orapa and Letlhakane Diamond Mines and the Government Departments in the Letlhakane Administrative Centre.

4 MATERIALS AND METHODS

4.1 Sampling

The sampling method was non random, because most of the ranchers reside elsewhere as absentee owners. During the survey, trips had to be made to the ranch sites, and interviews were conducted with ranchers found there. This time was also used to establish from the respondents where those not found could be found. Additional trips were then made to follow them up and interview where they are found. Therefore most of the interviews were done outside the study area. Most of those interviewed were resident within a 100km radius of the ranches. Although areas of residence for most ranchers were established, distances and budget made follow -ups to areas beyond 100 km radius impractical.

A total of 36 ranchers were interviewed, efforts were made to make the sample as representative as possible by interviewing a mix of the different ranch groups. However this was not an easy task, the absence of respondents at the ranches meant that only those who were traceable and reachable within the limits could be interviewed. The sample is therefore made up of 28 borehole grantees and 8 new occupants (6 allocatees and 2 who bought). This is more or less a reflection of the obtaining situation. The ranch demarcations were made on land with already existing water rights and this group is what constitutes borehole grantees.

4.2 Data collection

The study uses primary data from field research, secondary data and information obtained during informal discussions with officials, cattle post owners and other key informants.

Primary data

Primary data collection focused on respondents who have ranches within Area 4B (ranchers). Data was collected through individual interviews with ranch owners. A total of 36 ranchers was asked questions on demographic characteristics, economic activities, property and property values, livestock population dynamics and values, ownership, management styles both before and after ranch demarcations and allocation, ranch developments, environmental constraints to livestock production, marketing and displacement of resident populations. Respondents were also asked to bring forward any other comments they had regarding the

privatisation and its implementation in their area. This was done as an effort to capture information that the questionnaire might miss, but which may be relevant to offer explanations to observations.

Secondary data

Secondary data was obtained from different sources government departmental reports. Some data was obtained through informal discussions with farmers outside Area 4B, elders in the villages adjacent to the study area and government officials, working in the area. Government officials engaged in the discussion included the local chiefs of the three villages, the Veterinary Officer, the Remote Area Dweller Officer, the Land Board and the District Lands Officer. Issues discussed included past practices in livestock and range management, veld product collection. Other secondary data included existing spatial data and non spatial data such as vegetation, hydrology, topography demography and maps of the area.

4.3 Data Analysis

Statistical analysis was performed on all variables for which the data was collected, using excel and minitab-14. Prior to analysis data was grouped according to the intended use for ease of analysis. The statistical packages and functions used to analyse the data is described below.

Microsoft office excel 2003 was used to generate charts to display ranchers age distribution, livestock population and composition, proportion of reasons ranchers were dissatisfied with the size of their ranches and the proportion of environmental problems. Frequencies were calculated for livelihood sources, ranch development statuses and distribution of ranches by water quality² using excel. It was also used to sum up total wealth and incomes. To compute the wealth distribution of ranchers, the total estimated³ values of properties given, including the value of livestock was summed up. Total income was calculated by summation of all the income derived from economic activities from main to least.

²Water quality (used here to refer to salinity levels) was based on individual respondent's personal taste rather than scientific tests.

³Most people in the ranch area do not undertake proper property valuations; therefore the value of property was estimated (by both respondent and researcher) using known current prices of similar property in the market.

To address the research question, dealing with equitability of the ranch allocation process, a qualitative review and analysis of the score system used by land Board to identify beneficiaries of new ranches is undertaken.

To establish the level of ranch development, the following variables were used as indicators of development; construction of a perimeter fence, division of ranch into paddocks, water reticulation into these paddocks, borehole drilling and construction of kraals. A computation of the proportions of ranches that had undertaken any of the above investments was made and presented as a frequency table.

The ranchers were divided into two groups, representative of the method through which the ranch was obtained. Minitab-14 was used to analyse associations between variables and test significance levels. The criteria for ranch acquisition provides reason to believe that new ranch occupants may have more incomes, wealth, total cattle, total stock and years spent in school than borehole grantees. Therefore to determine the occurrence of differences on the above variables one-way analysis of variance was employed to compute mean values of the stated variables and to test the significance of these differences.

Binary logistic regression was used to establish associations between ranch development and the following socio-economic variables; wealth, income, cattle numbers and total livestock. Binary logistic regression was used because the response variable (development indicator) had only two possible values (developed and not developed). A chi-square analysis was used to measure the dependence of ranch development (perimeter fencing, paddocking, water reticulation, borehole drilling and kraal construction) on variables such as ranch residence (on or off ranch), ownership type (grantee or new occupants).

Description of secondary data on total livestock in the study area and responses to questions on livestock and rangeland management was employed. Responses to questions on livestock populations and composition, purpose of different livestock, milk production and marketing are used to portray the kind of management that exist in the study area.

5 RESULTS AND DISCUSSIONS

5.1 Socio economic characteristics of the respondents

The occupants of ranches in area 4B can be divided into three different groups. Upon the demarcation of the area into ranches, pastoralists who had existing water rights in the area, automatically qualified for the ranch within which their borehole or water point lies. This group is known as borehole grantees. The next group consists of farmers, who were allocated the remaining free ranches, through an application process, where they had to satisfy land Board criteria (see Table 1). For purposes of this paper I refer to them as the allocatees. The final group of owners consists of those that bought ranches, either from the borehole grantees or from the allocatees. The last two groups (the allocatees and the buyers) are referred to as new occupants for analysis purposes, thus they constitute a single group. Out of 36 interviewed ranch owners, 28 respondents acquired their ranches through the borehole grantee method and six (6) of the ranchers were allocated the vacant ranches through the application process, while 2 purchased the ranches.

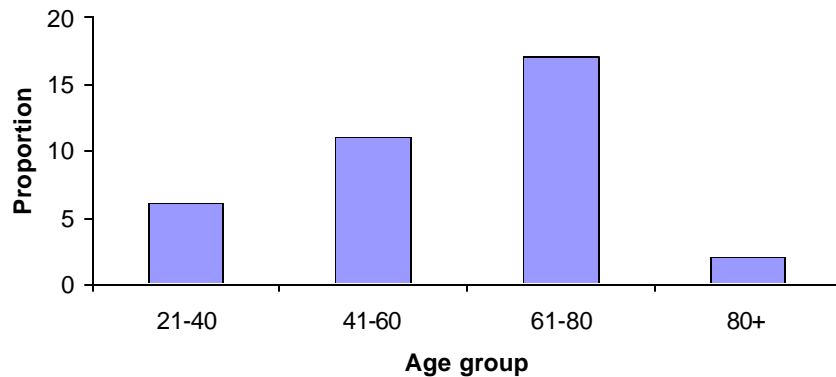


Figure 2. Age distribution for ranchers

Participation of youth is vital to the future of any economic sector. Past research has shown that relatively few youth participate in the livestock sector as they view formal employment as a more secure and reliable form of employment (MoA 2004). In the study area more than half of the respondents are over 60 years (Figure 2). This does not bode well for the future of livestock sector. The high risks associated with investment in the livestock sector, especially ranching, may be prohibitive to the youth. This observation does not however imply that youth can not partake in ranching. Other ways of owning a ranch include joint ventures

partnerships, such as family syndicates or companies and inheritance. However, inheritance would not necessarily invite youth, because it only happens after death of the current owner. Given today's improved health and increased lifespan, life expectancy in 2001 was calculated at 55.6 years (CSO 2001) most people would inherit ranches when they are much older. The data shows that the average farmer is fifty-eight (58) years old.

The ageing population in the livestock sector has serious implications for the sustainability of the sector. Participation of the youth in livestock industry is important in strategies that aim at improving production in order to sustain the economic and social viability of the sector. This observation was raised during the informal discussions with key informants. Most people expressed concern that the youth were not taking part in the livestock sector and privatisation was seen to be making it even worse, through perceived prohibitive investment costs. The informal discussions also noted that most young people engage in livestock farming as a retirement project or for value increases speculation.

The data indicates low levels of participation by women, only 5 % of the respondents were females. Past studies have indicated that female farmers have limited access to productive resources and this contributes to their low participation in the livestock sector (MoA 1997).

Livelihood Sources for respondents

The research showed that cattle sales are an important economic activity (Table 1). Cattle sales are especially important for borehole grantees, who constitute 77% of the sample and do not participate in formal employment. Most of them have passed the official economically active age to be involved in formal employment. However paid or formal employment contributes significantly to livelihoods in the study area. Most of the respondents who participate in paid employment are employed by the Orapa diamond mine, either as artisans or engineers. The diamond mine is the highest paying employer in the area, followed by the government offices at the rural administration center in Letlhakane.

Table 1. Main Livelihood source ranked by importance

Rank	Economic activity	Count	Percent
1	Cattle sales	17	47.22
2	Paid employment	15	41.67
3	Hawking	3	8.33
4	Arable farming	1	2.78
Total		36	100

Hawking (the informal selling of food items in small mobile tuck shops) is mainly a field for women, but a few of the interviewed men were participating in the sector. Although cattle sales were reported to be the main economic activity undertaken by most respondents, it was observed that, even people who made more money through paid employment than cattle sales would still report cattle as their main source of livelihood. This may be because of the status still associated with ownership of cattle than the benefits derived from them. The cultivation of crops is generally not done in the study area or villages adjacent to it, because of the poor saline soils.

5.2 Livestock production

The total livestock for the sample is 5676 livestock units, the average livestock number is 157 units per ranch, the median is 107 heads while the maximum number of livestock for the sample was 788 animals. The composition is as follows; 73.7% Cattle, 21% goats, 2.5% Donkeys, 1.7% horses and sheep make up 1.07% (Figure 3).

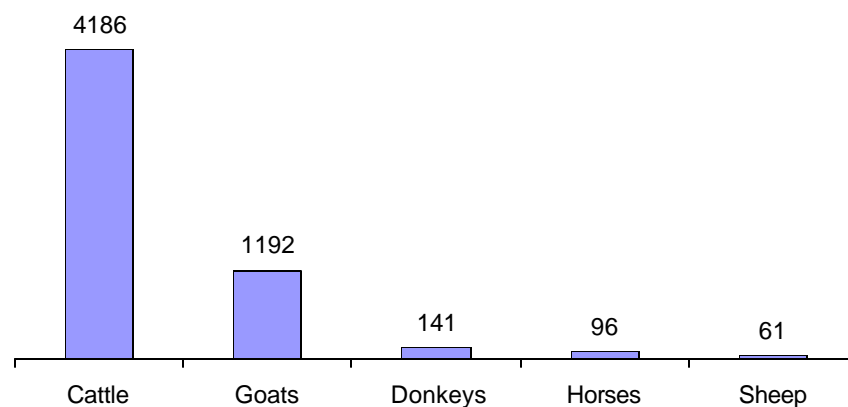


Figure 3. Livestock population and composition

Cattle are the most preferred livestock in the study area mostly because, these are commercial ranches for beef production, cattle also fetch much higher prices than any of the other livestock types. Those ranchers that diversified their holdings reared small stock, especially goats; this may be because goats market is a growing niche in commercial production. Goats are also known for their shorter gestation periods and can therefore multiply faster. Ranchers reported that it was also easier to sell a goat than cattle. Therefore even though their main enterprise was beef production, diversifying into goat production was undertaken to take care of more short term needs, like routine expenses, especially school uniforms, food items and animal health.

Donkeys and horses were kept to meet the daily transportation needs, especially for the resident herders. It was however established that among the two, horses were the most valued, as ranchers were able to put monetary value to horses than to donkeys. Farmers were also more certain about the number of horses they had, than that of donkeys. Some farmers when asked how much a donkey would cost, responded; 'Who would want to buy a donkey?' Donkeys are therefore often found lost all over the ranch area, nobody really cares about them and they are regarded as a nuisance. They are the only type of livestock that would be given away with ease.

Livestock mostly grazed on natural vegetation growing in the ranches. However during times of drought, supplementary feeding is undertaken with fodder bought from the livestock feed centres. Therefore availability/access to income is important for ranchers to feed their livestock. However most of the veterinary services are offered free by the government. The respondents indicated that they do not undertake any deliberate measures to practice rotational grazing. According to them, livestock locate grazing areas by themselves and know the best places with good resources. Other reasons given for not practicing rotational grazing is that it does not make sense given the small area available for grazing and that they had not fenced or paddocked their ranch.

Milk Production

Data on milk production of cows were collected during the survey. Milk production depends on the availability of adequate grazing and water in the area. The respondents were asked if they milked their cows, and to estimate the amount they got during the wet and dry season. Productivity was reported higher during the wet season and very low during dry season.

Respondents explained that they only milked about 1-2 litres per head per day of lactating cows in the dry season and from 3-5 litres per day in the wet season. Milking was mostly done for domestic use by the herders. There was an occasional making of sour milk for sale in the villages by the herders during the wet season. This was however done without the knowledge of the ranchers as they, did not allow too much milking, because they were interested in calf development than milk production.

Marketing

According to information from the ranchers, constraints on livestock sales are many and varied. First they have to wait for the Botswana Meat Commission (BMC) to announce dates for buying from their area, which happens twice a year. Prior to sending their cattle to BMC their livestock has to be trekked to the Setata quarantine camp, where they stay for 21 days to fulfil livestock disease prevention requirements. The ranchers argue that because the whole of the area sends their livestock twice a year at the same time, there is quite a high concentration of livestock at the camp and the resources get depleted quickly. During these 21 days, livestock loses weight and subsequently fetches low prices at the abattoir and profits are therefore less. The trek routes from the ranches to the camp are not developed, there is no water along the way and therefore more weight is lost on the long way to the camp. They felt that the situation could improve if BMC visited their area to buy livestock at their ranches. The motivation for commercial farming is also lowered because those who have fenced did not understand why they had to quarantine their livestock, although they were already separated from the rest by the perimeter fence.

5.3 The process of ranch acquisition and Social equity

The land allocating authorities (Land Boards) advertise vacant ranches and hopefuls have to show their interests by applying. To make decisions on who benefits, the land board uses, a score system. Table 2, below provides a checklist that is used to screen personal attributes of applicants.

Table 2. Checklist for ranch eligibility for non borehole grantees

Name of Applicant		Gender	
		M	F
Area where ranch is sought			
Date application received			
a.	Understanding of expected investment levels. P275 000.00 for all phases excluding stocking. 1 to 4	4 marks for minimum of P275 000.00 and provision for stocking. 3 marks for P275 000.00 without stocking provision and 2 marks for anything less.	
b.	Understanding of various phases in ranch development. 1 to 4	Perimeter fencing, water development, paddocks, firebreaks, water reticulation, handling facilities. 4 marks for full appreciation of the stages and order, 3 marks for partial appreciation and 1 for total lack of appreciation.	
c.	Perimeter fencing and paddocks. 1 to 4	Provided for in costing and implementation plan. 4 for full provision, 2 for partial provision and 1 for no mention.	
d.	Fire breaks. 1 to 4	Provided for in costing and implementation plan. 4 for full provision, 2 for partial provision and 1 for no mention.	
e.	Water development and reticulation. 1 to 4	Provided for in costing and implementation plan. 4 for full provision, 2 for partial provision and 1 for no mention.	
f.	Livestock levels and stocking of ranch. 1 to 4	Provided for in costing and/or existing livestock. 4 for full provision, 2 for partial provision and 1 for no mention. 154 LSU is minimum stocking levels.	
g.	Handling facilities. 1 to 4	Provided for in costing and implementation plan. 4 for full provision, 2 for partial provision and 1 for no mention.	
h.	Commitment and understanding of industry and/or provision of relevant skills. 1 to 4	Have been active participant in the industry, have been a supplier, eg abattoir, appreciation of disease control measures and provision of relevant skills. 1 mark for each item to a maximum of 4	
i.	Diversification. 1 to 4	Beef only 3. Beef and/or other viable industry 4.	
j.	Existing livestock in the area. 1 to 4	Existing livestock within ranches 4, livestock in buffer 3, others 2	
k.	Access to water sources. 1 to 4	No access 4, access by tenancy 3, syndicate membership 2 and own water point 1.	
l.	Funding sources and supporting assets. 1 to 10	Current assets 4, bank reference 2, fixed assets 3 and borrowing 1. up to a maximum of 10	
m.	Ownership of ranches elsewhere. 1 to 10	Have more than 1 ranch 1, have one ranch 2, syndicate member of more than one ranch 1, syndicate member in one ranch 3 and no ranches 10.	
n.	Citizen status. 1 to 10	Citizen or wholly owned citizen company 10, citizen majority shares 5, citizen minority shares 2 and non-citizen and non-citizen companies 1	
Total			

The criteria allocated marks ranging from 1 to 10 under several headings/parameters. Information on the various parameters is drawn from the management plan submitted by the applicant. The management plan is a document indicating how the potential farmer, intends to carry out commercial ranching. The management plan would indicate understanding of various phases in ranch development such as firebreaks, perimeter fencing, paddocking, water development and reticulation. Full appreciation and provision of each of these in the costing and implementation plan fetched 4 marks (a total of 16 marks). Understanding of expected level of investments, which at the time of advertisement (2000) was set at a minimum of 275 000 (roughly 51 000 USD) excluding stocking, was allocated 4 marks, 3 marks were awarded

for planned investment of 275 000 Pula with no provision for stocking. Anything less than this was allocated 2 marks. Availability of 154 livestock units or provision of funds to purchase the required number of livestock was expected, and 4 marks were awarded for this, 2 marks for partial provision while no mention got 1 mark.

a) Diversification proposal; 4 marks were awarded for a mixed enterprise of beef with other viable industry, while 3 marks would be allocated for specialising in beef production.

b) Existing livestock in the area; 4 marks were awarded for existing livestock in the area, 3 marks for livestock in the periphery and elsewhere was awarded 2 marks

c) Access to water point; those with no access to water gained 4 marks while those who had access by tenancy had 3 marks. Syndicate membership was worth 2 marks while those who had own water point scored 1 mark.

d) Funding; Consideration was given to those with own resources, bank reference were worth 2 marks, current assets 4 marks, fixed assets 3 marks and borrowing was worth 1 mark. Such that funding sources and supporting assets were in total worth 10 marks

e) Whether or not a farmer owns any ranch; 10 marks were awarded to would-be first time ranch owners, 3 marks for members of syndicates with one ranch, 2 marks a member of a syndicate with more than one ranch and if one already had a ranch they would be allocated 1 mark.

f) Citizenship; whether a citizen or not; Citizens or citizen owned companies and syndicates carried 10 marks, while a citizen majority shares got 5 marks, citizen minority shares got 2 marks and non citizens were awarded 1 mark.

g) Interview by the Land Board. Was worth 26 marks (During the interview it is expected that the potential farmer should demonstrate a good level of understanding of his/her management plan.

The maximum possible score was 74%. A cut off number was identified and all those with scores above it were called for interview. The score of the interview and the assessment were added to a grand total that was then used to decide the beneficiaries. Talks with officials on the equitability of this method of selection observed the following:

Most of the management/business plans submitted were developed by consultants rather than the beneficiaries. Thus the understanding of commercial livestock farming shown in the plans did not necessarily reflect that of the beneficiary, but rather theoretical understanding by the

consultant. This lack of understanding became apparent during interviews, when most applicants with higher scores did not know what was contained in their plans and therefore scored relatively less for the interview. Therefore the continued non-development of ranches into commercial enterprises might be a manifestation of this lack of understanding. The need to acquire ranches to an extent of hiring consultants to write management plans may indicate the need to own land, but not necessarily the need to undertake a commercial enterprise.

Ever since the land board's need for applicants to provide management plans, it has become common to see management plans for sale for amounts ranging from 2500-5000 Pula (roughly 463-926 USD). To the extent that traditional pastoralists are usually less educated and not connected, they are most likely not able to meet land Board requirement for ranch application and thus would score less, and not qualify for a ranch.

Lack of a comprehensive information management system may mean that the land Board had no way of verifying some of the information provided in the management plans: applicants could make claims that they had no ownership of boreholes/access to water anywhere, do not own ranches elsewhere in the country, inflate the value of their assets, and include in their management plans investment capital that they do not possess nor have the ability to qualify for and still score good marks.

The need to provide for a minimum investment capital and 154 livestock units is a sure way of providing a real opportunity for the well-off to engage in large scale land speculation. These ranches are allocated on a fifty year lease at no charge to the applicant. The lease contracts are renewable, heritable, sub leasable and sub dividable with permission form Land Board An annual lease fee of 0.70 Pula per hectare is payable to the land board upon signing the lease. The ranch sizes range between 3600ha – 6400ha, therefore annual lease would cost between 2520-4480 Pula (roughly 467-830 USD). The scenario produced by these figures may mean that those who are not able to make profits due to inability to undertake commercial production may not be able to afford these rentals. Data collected indicate that the majority of borehole grantees (previously traditional pastoralists) do not even have the minimum required investment capital to undertake commercial farming; therefore they are the most likely group not to afford the lease fees. Ways of coping with this eventuality may already have been found, if the numerous newspaper lease sale adverts are anything to go by. Prices for these leases range from 500 000-2000 000 Pula (roughly 93 000-371 000 USD)

indicating presence of a lucrative land market. This mechanism may result in mass displacement of current owners who do not afford the rentals, therefore leaving behind only those who have enough wealth to persevere, even in the face of adversity. These may be distress sales by poorer ranchers with little risk bearing abilities is expected to displace all 'inefficient' ranchers (this group will most undoubtedly be made up mostly of the borehole grantees, given their current socio economic statuses) and replace them with more wealthier and supposedly more efficient new occupants. When faced with adverse shocks such as drought, diseases, and outstanding lease rental fees most the borehole grantees are expected to be forced to dispose of their land. Better endowed ranchers will be able to insure against such shocks through access to credit, temporary depletion of accumulated non-ranch assets and diversification of income sources.

Displacement

Ranches will therefore be allocated to individuals with the 'Proven' ability to utilize them. Lack of resources (Income, cattle and current and fixed assets) will render one an unsuitable candidate to acquire exclusive rights to grazing. What this assessment tool does therefore is facilitation of borehole owners, who previously only had de-facto rights to grazing around their boreholes exclusive rights to previously communal land. The system also affords wealthier and privileged citizens a chance to acquire exclusive rights to communal land. There are however no alternative livelihood options through employment creation nor improved beneficial use of the remaining communal lands. This system allocates private rights in an area that is already occupied and used by two groups of people, tenant pastoralists and hunter gatherers.

Tenant pastoralists

During the fencing feasibility study for area 4B, it was observed that some pastoralists who owned boreholes in the area had few livestock units or did not have livestock at all. These pastoralists watered livestock belonging to non borehole owning pastoralists who used the grazing resources in the area (DOL 2000). A total of 60 pastoralists, owning a total of 3570 cattle, 216 sheep, 2489 goats, 86 horses and 187 donkeys were recorded as 'watered for'⁴ (ibid). This arrangement was done either for free or at a cost; usually borehole engine maintenance or stipulated payment, either stock or cash. The total livestock in the area for

⁴These are the tenant pastoralists whose livestock depended on water from boreholes belonging to others

both borehole grantees and non borehole grantees was reported as 8470 cattle, 544 sheep, 4862 goats, 175 horses and 311 donkeys (ibid). Effectively the demarcation and allocation of private ranches in the Boteti area 4B will displace 45% of the total livestock because it does not belong to the 'right' people.

These displaced pastoralists have had to go and seek for alternative pastures in the communal land that is left. To this effect during the study period, the researcher met a group of the aggrieved displaced pastoralists, who intended to contest the system of identifying ranch beneficiaries. They felt that the government could have treated all resident pastoralists as automatic beneficiaries of ranches rather than only allocating exclusive rights to borehole owners and advertising the rest. Their argument was that by virtue of having livestock in the area they already have shown inclination towards livelihood based on livestock rearing, therefore they deserve 'cattle grantee' status. Although the ranch eligibility checklist provides at sections j and k, the potential for tenants to earn more marks and therefore stand an improved chance to be allocated a ranch, the cumulative marks from section a-h by other competitors from elsewhere is overwhelmingly high. Tenant farmers are traditional farmers who have less an education and income like their former counterparts, the borehole grantees. They may therefore not be able to engage consultants to write their management plans.

Hunter-gatherer Communities

Prior to the demarcation of the Ranches in area 4B, 225 Remote Area Dwellers⁵ (RADs) were counted at boreholes within Area 4B (DOL 2000). RADs comprise mainly of san communities, whose main form of livelihood is hunting and gathering. Only 23 of these were employed as herders, the rest engaged in hunting and gathering. During the research this group of people could not be found within the greater fenced area, but had been moved to Kedia settlement. The main source of livelihood for this group now at their new settlement is the monthly government RADs assistance package. The above discussions are an indication of the social inequity that is created by privatising communal range lands. Pastoralists are forced out of livestock production by instruments of government, with no alternative means of survival. As a way of compensation, Ngwato Land board has set aside an area measuring 29000 ha (Hima ranch) to accommodate the RADs economic activities. The sustainability of this is questionable against the same grounds that privatisation of grazing land is. This piece

⁵These are people residing outside designated villages and settlements.

of land was set aside for use by RADs in 2000, but no developments have taken place in that area to date, owing to unreliable water quality and lack of funds. There is however an ongoing consultancy to develop a management plans for Hima, as part of the activities of the Indigenous Vegetation Project. The plan is to identify activities that can be undertaken as a community initiative.

5.4 Socio economic differences between ranch beneficiary groups

The preceding discussions on socio economic characteristics, livelihood sources and livestock production by the respondents laid grounds for comparisons between the groups. The criterion for ranch ownership, (type of rancher) is the basis of comparisons made. The data in Table 3 indicates the differences between ranching groups (the grantees and the new occupants). On average the new occupants have spent more years at school (more educated) than the grantees. This also compares favourably to the government statistics for the entire country where older people are less educated than the younger members of the population.

Table 3. Mean values of socio economic variables for ranchers

Variable	Type of rancher		P Value	F- test
	Grantees	New occupants		
Age in years	60.7	50.38	0.103	2.80
Years spent in school	4,179	10, 88	0.001	13.16
Wealth (in Pula)	194 930	1,022 556	0.000	40.95
Annual Income (in Pula)	34 382	232 125	0.000	29.79
Cattle	91.1	204	0.029	5.23
Total stock	122	282	0.022	5.76

The new occupants are on average much wealthier than the borehole grantees, income and livestock distribution are skewed toward new occupants (Table 3). The wealth of the new occupants may be attributed to high income levels that may make it possible for them to engage in wealth creating activities. Access to assets enhances income generating potential of households; it affects household's ability to be able to carry out certain livelihood options. Livestock ranching requires high wealth and financial resources. Credit facilities require

collateral, thus proven candidacy depends on value of assets at a households disposal and income available to it.

The criteria used for selecting new occupants, which requires a show of available wealth, ensures that the new occupants are wealthier than the more traditional borehole grantees. The ranch applicants were expected by this criteria to have at least 275 000 Pula (roughly 51 000 USD) as investment capital. This obviously places them at a higher income bracket than the borehole grantees, who are found practising traditional pastoralism and are expected to convert to commercial production. It is however also important to appreciate the difference in income levels that may be brought about by increased education, that is possessed by the new occupants. Education increases chances of attaining better paid jobs. There is reason to believe that mean values for all selected variables are higher for new occupants than for borehole grantees. The criteria for selecting new occupants give reason to believe that new occupants may be wealthier, more educated, have more livestock and income than borehole grantees. One way analysis of variance was used to test the significance of these differences, the results of the test indicate that the differences are significant ($p < 0.05$). This is true for all the variables except age ($p > 0.05$). The insignificance in age difference among the groups may just be an indication that age was not a determining factor for eligibility to a ranch.

5.5 Ranch development and management

Private rights to rangeland confer upon individuals rights to exclude others from enjoying grazing resources that lie within a specified grazing area. This is done with the assumption that beneficiaries will fence off the defined area such that they are the sole manager and exploiter of the resources within. Infrastructural developments are thus part of the process of commercial farming. The following infrastructural developments are expected of a fully developed ranch; perimeter fence around the property, paddocks (usually 4), water reticulation to all paddocks, weaning-and-breeding facilities, and cattle dipping facilities. The development statuses of the sample ranches are indicated in Table 4 below.

Table 4. Ranch development indicators

Development Indicators	Response Frequency (%)	
	Yes	No
Perimeter fence	8 (22)	28 (78)
Paddocks	7 (19)	29(81)
Water reticulation	7 (19)	29 (81)
Borehole drilling	34 (94)	2(6)
Kraal constructed	32 (89)	4(11)

All the farmers had drilled boreholes, although some were not usable because of the salinity levels. This is just an indication of how significant water is to livestock farming. It is almost tradition that before one thinks of pastoralism as a livelihood option; the first thing they have to establish is availability and access to water. The importance of water to livestock farming was summarised by one farmer as below ;

“Selling my cattle is not something that I do easily,..... but when it has to do with my livestock water supply I’d sell my best beast to repair the borehole”

Another infrastructural development that receives attention was kraal construction. Kraals provide an overnight shelter for livestock and protection from predators, so farmers engage in kraal construction immediately. The costs of kraal construction are relatively modest. Boreholes and kraals are the same infrastructures that can be found at cattleposts, therefore, considering them as development indicators for ranches is not a proper measurement of commitment to commercial farming. For this reason, in the analysis that deals with relationship of development indicators with other variables they will be left out. The major development that had occurred was the construction of perimeter fences, in 22% of the ranches. This means that on average 78% of the ranches have not been developed beyond the kraal/borehole stage. The general observation is that the majority of ranch owners did not invest in ranch development except borehole drilling and kraal construction. This may indicate lack of resources needed to undertake development. Socio economic variables are used below to establish associations with ranch development (Table 5).

Table 5. Associations between ranch development status and socio economic factors

Predictor Variable	Development Status		Z-Value	P-Value
	Fenced	Not fenced		
Wealth (in Pula)	963 431	178 233	-2.87	0.004
Income (in Pula)	212 625	39 953	-2.55	0.011
Cattle	298	64	-2.67	0.007
Total livestock	394	90	-2.43	0.015
	Paddocked	Not paddocked		
Wealth (in Pula)	1,032 993	188 519	-2.41	0.016
Income (in Pula)	240 714	39 127	-2.36	0.018
Cattle	311	69	-2.53	0.011
Total livestock	415	95	-2.34	0.019
	Reticulate d	Not reticulated		
Wealth (in Pula)	869 492	227 984	-2.36	0.018
Income (in Pula)	191 714	50 955	-2.36	0.018
Cattle	282	76	-2.36	0.011
Total livestock	380	103	-2.36	0.019

The above results ($p < 0.05$) indicate that there is sufficient evidence that the coefficients of the predictor variables are not zero. The negative estimated coefficients represent the change in the level of development when any of these predictor variables are increased, compared to when it is reduced. These coefficients also indicate that a rancher who has more of any of the predictor variables tends to have a higher probability to develop than one who has less.

The Log-Likelihood ratio was used to test whether there was difference in development brought by possession of any of the above predictors (the null hypothesis that all the coefficients associated with predictors equal zero versus these coefficients not all being equal to zero). This data indicates that there is sufficient evidence that the predictors make a significant difference.

Having established that wealth, income, total livestock and cattle numbers determine ability to develop, a chi-square test of dependence was run for the three development indicators to establish any significant differences on development statuses between the two groups (Table 6). It is important to note at this juncture that chi-square tests are sensitive to presence of empty cells, and given the small sample size, the results presented by these calculations should therefore be used with appreciation of this.

Table 6. Differences on development statuses by groups

Development Status	Method of acquisition		χ ²	P-Value
	Grantee	New Occupants		
Perimeter fenced	4	4	4.592	0.032
Non fenced	24	4		
Paddocked	3	4	6.131	0.013
Non paddocked	25	4		
Water reticulated	4	3	2.141	0.143
No reticulation	24	5		

The results show that half of the new occupants had fenced while only 16% of borehole grantees had not. Eighty-nine percent (89%) of the borehole grantees had not constructed paddocks, while half of the new occupants had. The association between method of acquisition and both perimeter fencing and paddock construction is significant ($p < 0.05$). The majority of both borehole grantees and new occupants have not reticulated water. There is no association between water reticulation and method of acquisition ($p > 0.05$).

Although livestock farming is entrenched in the culture of Batswana (the people of Botswana), commercial production or ranching as is commonly referred is largely a new concept. Thus the slow rate, at which ranch development is being undertaken, may indicate the level of responsiveness of existing cultural system. Policy reforms such as promotion of commercial ranches should be developed alongside development of an environment conducive to their sustainable implementation. Ranch beneficiaries cited lack of services and infrastructure such as good roads, electricity and desalinisation plants to explain the slow rates of development. Other reasons given for no development included the need for more land (dissatisfaction with ranch sizes), inability to meet the bank requirements for loans, especially down payments and the risks associated with commercial loans, such as repossessions in case of failure to service the loan.

For commercial livestock production, therefore accessing land is just a first step in a long process of economic development envisaged by government. After land has been transferred, government has a responsibility to provide assistance in the form of credit tailor made for ranch development. Credit system reforms are needed to allow possibilities of acquiring

loans. Since the culture of livestock production is not commercial, there is need to educate ranch beneficiaries on commercial ethics of livestock production. Advice and assistance are needed to facilitate economic undertakings in commercial enterprises such as those envisaged for ranches. Government investment in infrastructure such as, telecommunications, road networks and power supply can create an environment conducive to development initiatives. Training should also be undertaken to impart the spirit of commercial ranching on the beneficiaries. Empowerment of beneficiaries in this way should not be done at demonstration sites only, but also at the beneficiaries' ranches. This might prove expensive in the short run, but the long term benefits may be worth all resources put in the implementation.

As mentioned in the introduction, the rationale for supporting private ranches is so that they can permit economic growth, such that the benefits of ranching must be able to compensate for the social costs it generates. This pay back system will come through payments of lease rentals and profits to be generated from commercialisation. Since the land boards are the ones administering land on behalf of these communities, lease rentals are payable to the land board for communal land development purposes. However information from officials is that since 2000 only a few leases have been signed, officials felt that the delay to sign leases may just be a deliberate strategy to avoid lease rentals, which take effect after signature of leases (Monageng, pers com. 2006). Most of the respondents (grantees) in the study area already occupied the area prior to the reform, thus they continue enjoying exclusive rights with no payments for as long as they have not signed leases. The realisation of profits may also not be as forthcoming as expected, given the slow ranch developments after allocation and no tangible infrastructural developments towards commercialisation. This observation is surprising ; If the selection criteria in (Table 2) for new occupants was thorough there should be no problems with development of ranches because, the presentation of management plans with implementation schedules, indicated the beneficiaries ability to undertake ranch development. Better-still if the information provided in the management plans was to be true, development would not be a problem at all, unless there are other explanations besides financial ability to carry out the stipulated development phases. The following issues are discussed as a way of offering possible explanations;

Hands-on management of livestock by the owner is an important factor in livestock production. Decision making is integral to any enterprise and production decisions in

livestock depend on the owner. Production will decrease if the key decision maker is not available to make important decisions as and when they are needed.

Residence

Ranch residence is important for several reasons; it allows speedy execution of decisions on management while residence elsewhere separates ownership and day to day management. Ranch residence is expected to have a bearing on the level of commitment to ranch development and sound management. The study established that only 36% of ranch owners stayed on the ranch while 64% stayed elsewhere. Of those who stayed elsewhere, 50% were borehole grantees while 80% were new occupants ($p > 0.05$). Whether they stay on farm or off farm is not determined by how they acquired the ranch. Most of the respondents who lived off-ranch could be found residing in towns and villages as far as 20-340 km away. All the farmers interviewed had engaged non trained herders, whose main duty was to ensure that the livestock had been watered and kraaled⁶. No other activities such as rotational grazing, controlled breeding were done.

The level of absentee managers displayed by the field data depicts similar pattern as that described by Hubbard in his evaluation of the Tribal Grazing Land Policy Ranches (1986). Absenteeism is a livelihood strategy that may have a dampening effect on investment in livestock production. Most part time farmers are engaged in formal employment, which is seen as more secure than livestock farming. Income from the formal employment may be invested in livestock farming, however management is not hands-on and the ranch owner does not adequately respond to local environmental dynamics (rain and drought, disease), borehole breakdowns and day to day management of his livestock. This may contribute to low productivity in the enterprise. The availability of alternative sources of income means that ranchers will reside where the source of this income is and this decision could result in current production not being maximized and relegated to after-retirement. The effect of residence on development is presented in Table 7.

⁶Led into enclosures

Table 7. Relationship between ranch residence and development

Variable	Residence		χ ²	P-Value
	On ranch	Off ranch		
Perimeter fenced	1	7	2.485	0.115
Not fenced	12	16		
Paddocked	1	6	1.794	0.180
Not paddocked	12	17		
Water reticulated	1	6	1.794	0.180
No reticulation	12	17		

The above results indicate that all the development indicators are independent of residence. There is no relationship between development status and where the owner lives. Relationship between distance from permanent residence and development tests for all the development indicators show p values > 0.05. This means that ranch development and distance of residence from ranch are independent.

5.6 Environmental hindrances to livestock infrastructure development and production

During the study it was observed that some ranches in the study area showed considerable amounts of bare ground compared to others. The owner of ranch number NN74, who was allocated such a ranch, explained that he has had to buy the adjoining ranch to augment resources in his allocated ranch. He explained that the extension officer believes that the ranch was demarcated in an area that used to trap seasonal rain water (*mogobe*) it could have provided a natural drinking place for high livestock numbers before the demarcations, resulting in high use intensity. However it was interesting to note that, although there was about 5 km patch of bare ground, towards the edges of the said ranch and in the adjacent ranches vegetation was thicker and widespread. A further indicator of variation between the ranches was provided by the wide spread presence of Bush encroachment, indicated by the presence of tree and shrub zones (located in specific ranches) dominated by *colospospermum mopane*. Occurrence of this tree is known to suppress growth of other vegetation especially grass. Some ranchers associated *colospospermum mopane* with the occurrence of *mathoa* (silk worm cocoon), which they blame for mortality among their livestock especially during drought when there is no graze and cattle start to browse on the tree leaves. Variability was however great from ranch to ranch.

Water quality and distribution

Water is the backbone of any livestock enterprise; therefore it is important to establish the availability and quality of water as these characteristics affect livestock production and ranch development.

Table 8. Water quality as perceived by ranchers

Quality	Frequency	Percentage (%)
Sweet	9	25
Medium saline	12	33
Salty	13	36
N/a*	2	
Total	36	100

*means the farmer had not sunk a borehole, so quality of water was not known

Most of the boreholes had saline water, 25 of the 36, even though the ranchers reported that the medium saline was consumable by livestock, 13 boreholes yielded water that was saline, undrinkable to humans, this meant that additional costs had to be incurred to ferry water that could be used for human consumption and also to dilute the salty water for livestock consumption. Chi-square analysis of dependence of all development indicators (perimeter fencing: $\chi^2 - 1.999$, paddocking: $\chi^2 - 3.392$, water reticulation: $\chi^2 - 0.974$) on quality of water revealed that ranch development was independent ($p < 0.05$) of water quality, however the presence of empty cells in outcome may be a result of a sample is small and the categories are many.

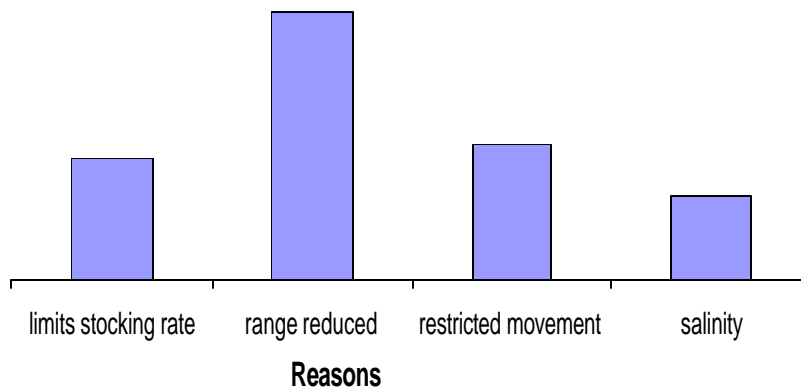


Figure 4. Proportion of reasons farmers are dissatisfied with size of ranch

Ranch owners were dissatisfied with the size of their ranches for a variety of reasons: the most occurring reasons are as indicated in the above figure. The resources within their ranch were seen to be limited. They felt that the resources got depleted quickly and they are forced to supplement. Some ranches were dissatisfied because the area was highly saline and they lost a lot of money through hitting blank spots or salty spots and prospecting for spots with better quality water, the extent to which this can be done in a ranch was limited. If one was unlucky and hit salty water, the implications are wide and varied. However those that have hit salty water have been able to seek for water from their neighbours, however this is not a sustainable solution, it was only possible now as most of the ranches remain unfenced. As one farmer put it

“Our neighbours are from town we don’t know how long they will be able to give us water like this”

Some farmers especially the ones with salty water blamed the government for allocating them private rights in an area with high salinity levels, they did not approve of the fences, but they are caught between the need to accumulate land through (private ownership) and the need for access to good livestock water.

Figure 5 below is a presentation of the proportion of problems ranchers believed were constraining livestock productivity levels.

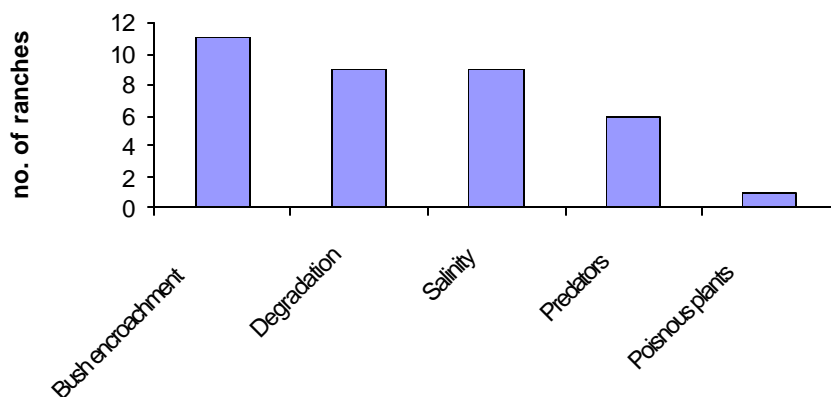


Figure 5. Proportion of environmental problems

Nine of the thirty ranches had problems with degradation, ranches that reported degradation as a problem had a high number of natural water points (dams and swamps). Before the

demarcations, when all livestock in the area was free to roam about, these ranches held high livestock numbers due to the presence of surface water. Thus a lot of pressure was placed on the resources in the area. Eleven ranches were reported to be overgrown with *colosphospermum mopane* tree. This species suppresses growth of grass, so wherever it is in high concentrations grass undergrowth, especially grass is minimal.

Salinity was once more reported as a hindrance to livestock production. Seven ranches reported this factor as a hindrance. This is understandable, because without water no livestock enterprise will prosper. Water development is the backbone of livestock farming. Predators were reported as a hindrance by six ranches. Only two ranches did not have any environmental constraint and one ranch had problems with poisonous plants.

5.7 The effect of scale on vegetation variability and mobility

The interaction of reasons given for dissatisfaction with ranch sizes and environmental problems discussed above, should act as a warning sign to the consequences of ecosystem fragmentation, that constitute privatisation of rangelands. The data clearly shows the heterogeneity of range resources of the whole study area. At this larger scale, the study area as a whole provides an ecosystem characterised by sections of plenty and sections of scarcity, entwined with sections of the desirable with sections of the undesirable characteristics, such that as a whole it becomes a balanced productive zone. This variation in the ecosystem is a characteristic that is harnessed by common property management. However, random demarcation of ranches (small scale) cannot be expected to contain the same variability as is found in an entire grazing area (c.f Abel et al. 1990)

Reduced mobility of livestock was mentioned among the reasons why respondents' were dissatisfaction with the ranch sizes. This was totally understandable; ability of livestock to move over large sections of the range is valuable because it ensures that livestock can access varied range of resources. Some pastures are only available seasonally, after the rains, thus uneven spatial distribution of rainfall makes movement from one place to the other necessary. The opportunity for use of resources in this way will be lost if all ranches in area 4B are fenced. However there are signs of mechanisms to cope with this eventuality. Some farmers have made gentleman-agreements to water each other's livestock; this was seen as a necessary arrangement given frequent borehole breakdowns and the occurrence of saline water. It is arrangements such as this that may offer explanations why ranchers were not fencing yet, data

indicate that some ranchers have enough capital or access for ranch development, but have been forced by the obtaining situations, to delay. Environmental variability has necessitated flexibility among some ranch owners. Most are not forcefully exercising their exclusive rights because of environmental shortcomings discussed. Can this be tough of as re-communalisation? Whether this mechanism could be construed as a re-incarnation at the micro scale of the traditional common property range management regime is food for thought.

6 CONCLUSIONS

The study has provided an overview of the rangeland privatisation policy in Botswana. It would seem that the allocation of private rights in the rangelands of Area 4B, has not resulted in substantial infrastructural developments, nor has the ranch beneficiaries shown any notable commitment to management changes towards commercialisation. This is so despite strict discriminatory allocation criteria for successful applicants set by Land Board. Given the foregoing it is clear that providing title to land alone cannot be expected to change beneficiaries' aptitude to commercial livestock production. Socio economic and environmental factors discussed in chapter 5 may impose limits to the extent to which this can be undertaken. This situation coupled with the emerging coping mechanisms, like the act of watering each other's livestock and the delayed enforcement of exclusive rights; raises several questions and observations. Are the beneficiaries realising, what they would be forgoing if they enforce their rights? Does conferring title in its present design and mode of implementation, offer the best way to achieve increased social welfare and protection of the environment? Should customary rangeland management regimes be dismissed as irrational or do they offer strengths that can be built upon?

It seems fair to conclude that allocation of private rights in area 4B, has only been successful in transferring rights of the greater majority to the wealthier members of the community. The results show that new occupants are much more likely to undertake development. However investments were shown to be more dependent on wealth of the ranch owner than anything else. Credit markets are not accessible to most of the ranch beneficiaries except the wealthier ones, because of high down payments. For commercial livestock production to be successful ranch beneficiaries should be selected from wealthy citizens. The results indicate that for the privatisation policy to be successful, only the wealthy should be allocated private rights. However, the results show that even the wealthy need to be assisted through capacity building. They should be encouraged to merge their ranches into bigger pieces in order to harness the benefits of large scale ecosystem. The poor should be overlooked because for as long as they are involved and credit market are as at present, privatisation policy will continue being a failure.

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