Water and Ecosystem Resources in Regional Development: Balancing Societal Needs and Wants and Natural Resources Systems Sustainability in International River Basins

Work Package 4 : Socio-economic and Environmental Change

Natural Resources Tenure and Access in the Okavango Delta by

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A contribution to Deliverable 4.1

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10/10/2002

1.0 Introduction

Issues on land and natural resources tenure have increasingly become important in recent years, particularly in southern Africa, since the adoption of the Community Based Natural Resources Management (CBNRM) as a strategy for rural development (Rihoy *et al*, 1999). This strategy is based on the assumption that communities will have an incentive to manage natural resources since the perceived benefits from these resources exceed the perceived costs (Rihoy *et al*, 1999). As a result of CBNRM, local communities are given some "defined rights and benefits" over the use of natural resources (Rihoy *et al*, 1999).

There is an on-going debate about the "devolution of the rights of the local communities to manage natural resources" (Johnson, 1999 p138 and Rihoy *et al*, 1999). In Botswana, the Government has made significant attempts to create a policy environment conducive to the evolving tenure system on natural resources (Rihoy *et al*, 1999). However, there is a concern that the traditional tenurial rights of the Basarwa (San people) are still not recognised, as they have been displaced from their ancestral lands in many instances in order to give way for ranching and development of protected areas (Taylor, 1999).

This study examines issues on natural resources tenure and access in the Okavango Delta and its environs. The Okavango Delta, a globally renowned Ramsar Site, obtains annual floods from the Cubango and Cuito river systems of the Angolan highlands. It flows through Namibia, where it is known as the Kavango, before entering Botswana. The Delta is characterised by large amounts of open water and grassslands, and is home to a variety of wildlife and vegetation species. The Delta is also an important attraction for tourism. As a result of rapidly expanding tourism which is speeding commoditisation and privatisation of the land and its natural resources, the natural resources tenure system of Ngamiland, and the Okavango Delta in particular, is complex. It is further complicated by environmental factors such as the distribution of tsetse fly, erection of fences for disease control, and the dynamic nature of the Okavango ecosystem itself.

This study is mainly based on information obtained from informal interviews and review of the literature. The informal interviews were conducted with various officers in Government departments, North West District Council, NGOs, community organisations, and safari companies. The preceding section reviews the concepts of natural resources tenure, and it serves as a theoretical framework for the paper. Section three reviews the land tenure system in Botswana, whereas section four critically examines issues on natural resources tenure and access in the Okavango Delta region. Section five concludes the paper with some policy recommendations.

2.0 Concepts of Natural Resources Tenure

In this section we define the concept of natural resources tenure. We also review the various types of tenure management regimes, with particular reference to Botswana, and Okavango Delta region in particular.

2.1 Defining Natural Resources Tenure

Natural resources are the land and its resources such as the soils, water, flora and fauna. In economics, the land and its resources are referred to as land, which is one of the four factors of production (Lipsey & Chrystal, 1995). Natural resources tenure is about the entitlements of the society to the ownership and use of natural resources. It provides a framework for obtaining, using, and distributing property rights over the use of natural resources. According to Rihoy et al (1999 p11), natural resources tenure is a "set of laws and relationships between institutions (legal and institutional framework) which determine the ways in which the rights to natural resources (property rights) are defined and enforced". The way in which the rights are legally formulated defines access to resources. In some cases, however, the practice of the use of natural resources may depart from the legal formulation. The rights which are in accordance with the legal formulation are known as *de jure* rights, whereas those which are in accordance with the actual practice are known as *de facto* rights (Cassidy, 2000). It is, therefore, important to understand how and whether the rules are applied. Issues surrounding natural resources tenure are critical since they are often the basis for policy formulation on resource management.

2.2 Management Regimes

According to Pearce & Barbier (2000 p166), "an appropriate system of property rights is one of the key institutions determining the success of policies for sustainable and efficient management of natural capital". In order for property rights to be effective instruments for natural resource management, they need to be well defined, secure, transferable, and enforceable (Panayotou, 1993 and Rihoy *et al*, 1999). There are four types of natural resource management regimes: open access, common property, state property, and private property, all of which prevail in Botswana. Since they are systems of access to tenure, property rights regimes are important frameworks for analysing issues on natural resources tenure and access (Hasler, 1999 and Arntzen & Fidzani, 1998).

Open access

An open access regime is one in which access to natural resources is not restricted, and therefore all potential users have access to it (Pearce & Barbier, 2000). In such a regime, there is a tendency for individuals to over-utilise a resource relative to socially sustainable levels because the private marginal cost of harvesting it is lower than its social marginal cost since the user costs are not taken into consideration by an individual (Tietenberg, 1996). This is what Hardin called "the tragedy of the commons" (Hardin, 1968). Resources such as grazing and veld products in communal areas of Botswana, including those in the Okavango Delta, are held under an open access management regime (Hasler, 2000, Hasler, 1999 and Arntzen & Fidzani, 1999). In such a regime, ownership usually prevents "optimal use of the land" leading to environmental degradation (Panayotou, 1993 p77).

Common Property

In a case whereby the rights are conferred on the community, and the rules for excluding others and regulating the use of the resource exist, the property regime is known as common property (Blaikie & Brookfield, 1987 and Pearce & Barbier, 2000). In his thesis of the Tragedy of the commons, Hardin (1968) failed to distinguish between common property and open access regimes. His basic assumption was that common property resources were open access.

Common property regimes are mainly distinguished by institutional arrangements which are adopted by people to manage natural resources, whereas open access regimes do not have such institutional arrangements. According to Blaikie & Brookfield (1987 p186), a common property resource (CPR) is : (1) "subject to individual use but not individual possession" (2) it has numerous users "who constitute a collectivity" and can introduce rules for using a resource and excluding those "who are not members of that collectivity". There is also a limited practice of free riding in the use of CPRs because users tend to co-operate (Runge, 1986). The tragedy of the commons may still be experienced in CPRs due to a breakdown in land management institutions, and not necessarily because of collective ownership as Hardin asserted (Blaikie & Brookfield, 1987). In areas under CBNRM in Ngamiland, the management of wildlife resources is held under common property management during the period of the lease in community CHAs (Hasler, 1999 and Mohamed-Katerere, 2001).

State Property

If property rights are conferred on the Government, the management regime is known as state property (Hasler, 1999). In southern Africa, national parks and forest reserves are usually under the control of the state. Botswana is not an exception as national parks and game reserves are under the control of the state. As section 4.3 shows, Moremi Game Reserve belongs to Tawana Land Board, and it is co-administered by this Board and the central Government. State property regimes are often associated with adverse impacts on economic, social, and environmental sustainability because the interests of the state individual employees often diverge from the collective ones (Tietenberg, 1996).

Private Property

The property rights of using the land could be conferred on "individuals, companies, or corporations" so that they have the right to exclude others (Pearce & Barbier, 2000). This tenure regime is known as private property. Privatisation is associated with inequitable distribution of, and lack of access to land (Argawal, 1986 and Runge, 1986). It therefore denies some of the households access to some of the environmental goods which used to be previously obtained from the commons, leading to more resource pressures (Wisner, 1988; Blaikie & Brookfield, 1987). In Botswana, the freehold farms, Tribal Grazing Land Policy (TGLP) and leasehold ranches are a private property, as the they are for exclusive use by the owners (Republic of Botswana, 1997). In addition, part of the tribal and state land under CBNRM in Ngamiland, as will be shown later, is in *de facto* terms privately used by safari companies during the period of the sub-lease agreement with the local communities.

3.0 Land Tenue Categories

During the Bechuanaland Protectorate period (1885 to 1966), the administration of the land, in the so-called reserves, was vested in the powers of chiefs who were assisted by headmen. The old Tswana law was the basis of the land tenure system since the Protectorate Administration had not made any attempts to reform it (Schapera, 1970). The land for grazing of livestock and gathering was a common property resource, whereas ploughing and residential land was allocated to households on the basis of the right of use rather than as personal property. Common property institutional arrangements were in most cases stipulated by the chief who was also responsible for the coordination of their implementation (Schapera, 1970).

Beginning in 1968, the chiefs legally ceased to be involved in the process of land administration as this authority was transferred to the state (Mohamed-Katerere, 2001). The Tribal Land Act of 1968 introduced the Land Boards as trustees of tribal land and also gave them the responsibility for land administration. They began to operate in 1970 (CCI, 1997). Traditional laws were done away with, and did not form a foundation for the establishment of formal laws which were introduced by the nation state (Moupo, 1987). The Land Boards are, *inter alia*, responsible for the allocation of land, cancelling of land rights, imposition of restrictions on the use of land, authorisation of the transfer of tribal land, and hearing of land disputes and appeals (Mathuba, 1998, and Abel & Blaikie, 1988; Arntzen & Veenendaal, 1986). However, they do not have the power to grant rights for the use of wildlife resources. Initially, the chiefs or their representatives as well as members of the District Councils, were ex-officio members of the Land Board. They ceased to be members in 1989 as the Central Government wanted this institution to be independent, particularly from political influence (CCI, 1997).

Botswana's three main land tenure categories are tribal land, state land, and freehold land. Tribal land accounts for 70% of the total land. It is divided into a number of zones, which include communal areas, wildlife management areas (WMAs), leasehold land, and other areas. Customary law and common law govern tribal land tenure. Customary law is based on traditional and historical practices, and it is not written. It is thus applied to the traditional use of natural resources by the Land Boards. All members of the community have traditional rights over the use of natural resources in their area, and such rights play a critical role in their livelihoods. Common law is written, and it is administered by the executive and the judiciary arms of the Government. This law is applied to commercial use of resources (issuing of leases) (Cassidy, 2000). The land for customary use is free of charge to citizens, and it is for residential, ploughing and borehole use. The tenure period for customary tenure is indefinite, while that for residential common law lease is 99 years. Property under customary tenure can only be sold to citizens, while that under common law can be sold to citizens or non-citizens. The agreement is formalised by a lease (CCI, 1997). The tenure period for commercial common law plots is 50 years (CCI, 1997). In order to sell property under the customary tenure, it is necessary to change it to common law tenure.

Freehold land, 5% of the land in Botswana, is for exclusive use, and can be owned perpetually (Republic of Botswana, 1997). State land accounts for only 25% of the total land, which is used as game reserves and national parks (16%), WMAs (8%), and forest reserves (1%) (Republic of Botswana, 1997). Parcels of the land on tribal land have been granted to people on 50 year leases under the Tribal Grazing Land Policy (TGLP) (Republic of Botswana, 1997). The TGLP was introduced in Botswana in 1975 to solve the problem of overgrazing by introducing property rights (Arntzen & Fidzani, 1997). It also aimed at achieving "greater equality of incomes in rural areas and "growth and commercialisation of the livestock industry on a sustained basis" (Republic of Botswana, 1975 p1).

In Ngamiland, 79% of the land is tribal, and the remaining 21% is state land. There is no freehold land. Tribal land includes the following land-use types: communal areas, Tribal Grazing Land Policy ranches, game reserves, and WMAs (Figure 1). Communal areas and WMAs are separated by the buffalo fence which has been erected to prevent the spread of foot and mouth disease from wildlife to cattle (Cassidy, 2000). The establishment of the TGLP marked the beginning of land use planning in Ngamiland as well as in other parts of Botswana. It led to the zoning of land into communal, commercial, and reserved areas. A spatial planning approach was then adopted by the Ngamiland District Council to divide the district into the following eight planning zones (Figure 2): Zone 1 (Seronga), Zone 2 (Gumare), Zone 3 (Ngami), Zone 4 (Maun), Zone 5 (Hainaveld), Zone 6 (Western Communal Remote Zone), Zone 7 (State Land) and Zone 8 (Delta).

Fig 1: Land Tenure Categories and Use in Ngamiland



Source: Ngamiland District Council, 1997.



Fig. 2 Land Use and Tenure in Ngamiland

Source: Ngamiland District Council, 1997

4.0 Management Regimes : Application of the Concept to the Okavango Delta

In this section we examine the dynamics of natural resources tenure in the Okavango Delta with particular reference to communal areas, WMAs, and Moremi Game Reserve. We initiate our enquiry by determining the kind of property rights or management regimes that are associated with the use of natural resources in these land use categories, and the extent to which people have access to these resources.

4.1 Communal Areas

The communal areas are mainly situated outside the buffalo fence in the southern and western parts, and account for 49.5% of the tribal land. As in other parts of Botswana, all citizens in the communal areas of Ngamiland are entitled to the rights of use of the land. The Land Board allocates some land, for exclusive use, to households for residential and arable purposes as well as for the development of groundwater sources. However, households in communal areas have in most cases open access to grazing, fishing, veld

products, and natural surface water, but not hunting rights (Hasler, 1999 and White, 1993). To illustrate the above issues on land allocation and access to natural resources, three case studies are discussed. These are case studies of tenurial rights relating to arable land, basket-making resources, and water resources.

4.1.1 Land for Arable Agriculture

There are two arable farming systems in the Okavango Delta: dryland and flood recession (or *Molapo*) (Tlou, 2000, and Sutherland, 1982). The former takes place in dryland, and the latter on flood plains of the Okavango Delta. The latter shows one of the ways in which the water from the Okavango Delta contributes to "human livelihood security" and also how land and water use interact (Falkenmark, 2000). There is an association between the type of farming system and ethnicity in Ngamiland. For instance, the HaMbukushu are more associated with dryland farming, whereas the BaYei tend to practice *molapo* farming (Bendsen & Gelmroth, 1983). The Land Board only allocates arable land for dryland farming, and does not allocate land for *molapo* farming.

Dryland farming is more common than *molapo* farming in Ngamiland partly because most of the settlements are in dryland, and also because there are places where the Land Board prevents the expansion of *molapo* farming such as in the Panhandle. The arable lands survey of 1978/79 revealed that 65 % of the farmers practised dryland farming in Ngamiland (Ministry of Agriculture, 1979). Recent figures for 1997 and 1998 reveal that this pattern has not changed since 73% and 84% of the farmers had farms on dryland, respectively. The allocation procedure for such plots is as follows: 1) The applicant usually identifies a plot and

Tuble 1. Humber of furths on Morapo and Dryfand by				Region III I	Summana			
	1997				1998			
REGION	MOLAPO	DRYLAND	Total	%	MOLAPO	DRYLA	Total	%
						ND		
Ngamiland	1,153	2,462	3,615	24.7	550	3,360	3910	29.4
West								
Ngamiland	553	2,509	3,062	20.9	112	2,118	2230	16.7
East								
Maun	2,185	5,772	7,957	53.4	1,456	5,722	7178	53.9
Region								
Total	3,891	10,743	14,634	100	2,118	11,200	13318	100
%	26.5	73.4		100	15.9	84.1		100

Table 1: Number of farms on *Molapo* and Dryland by Region in Ngamiland

Source; CSO, 2002

checks with the land overseer and those who live in the neighbourhood whether the plot is occupied, 2) if it is not, he/she then completes an application form which is then signed by the overseer and submitted to the Land Board, 3) the applicant is then invited by the Land Board for an interview. If he/she is given the right to use the land, he can then exclude others from using the land for arable purposes. In other words, the land should, in *de jure* terms, be used as private property during the period in which it is leased to the household. Resources such as trees are, therefore, a preserve of the user of the field. However, it is common that others may still harvest the resources in the field. For instance, after the new unfenced fields have been cleared, other households have a tendency to collect the fuelwood from the cut trees.

The 1978/79 arable lands survey revealed that 35% of the farmers practised the molapo farming system (Ministry of agriculture, 1979). Recent surveys of 1997 and 1998 give proportions of similar order of magnitude of 27% and 16%, respectively. Allocation of the land for molapo farming is still based on the traditional land tenure system (Rashem, 1988 and Ministry of Agriculture, 2002). The allocation of the land is carried out by the title-holders as they have control over the use of the land. These are people "who have been born and raised in the area" and are "descendants of the aboriginal and pioneer cultivators" (Sutherland, 1982 p6). According to Rashem (1988), the title-holders have inherited the right to allocate the land, suggesting that this traditional land tenure system is a private property regime. They may refuse to allocate the land, or discontinue the existing land rights if they wish. They may either lend a field with no obligations (go adima) or by asking the borrower to pay in kind by providing his labour services to their field (Dorloechter, 1989). As already stated, this allocation system falls outside the legal recognised tenure system. The advantage of the *molapo* land tenure system is that it is flexible, and hence it enables households to be responsive to the changing floods of the Okavango Delta. Its disadvantage is that it is characterised by inequalities in land control and access (Rashem, 1988).

Various sources of literature suggest that there is no scarcity of land for dryland arable farming in Ngamiland, but there are isolated cases of scarcity of land for *molapo* farming (Ministry of agriculture, 1981). A study undertaken in the villages of Motsaudi, Makakung, Danega, and Xaoga in the Okavango basin revealed that access to land (dryland and *molapo*) for crop production was not a major problem (Ministry of Agriculture, 1981). In the village of Matsaudi, however, access to the fields for *molapo* farming was limited and restricted (Ministry of Agriculture, 1981). Another study undertaken in Tubu in 2001 revealed that there was scarcity of land for *molapo* farming in this area. There was a concern by the young members of the community that some "people with access to *molapo* farming are refusing to allow others to use them even if the family is not using them at present, people are holding to them as inheritance" (Ministry of agriculture, 2002 p21). The scarcity of the land for *molapo* farming was attributed to population growth, and the drying up of the Thaoge river due to tectonic movements which raised the land, therefore reducing flooding (Ministry of Agriculture, 2002).

4.1.2 Basket-Weaving Resources

Basket-making has been an important commercial activity in Ngamiland since the early 1970s. Through the efforts of Malcolm Thomas, who was then the HaMbukushu Refugee Settlement Officer, the people of Etsha (Angolan refugees who had settled in the area)

were able to market their baskets nationally and internationally through the Botswana Craft Marketing Company as from this period (Terry, 1986, Cunningham and Milton, 1982). Basket-making also became an important commercial activity in other parts of Botswana. The economic benefit from basketry was estimated to be to be in the order of P225 148. 00 (1990 prices) in Botswana, a figure which accounted for 7% of the total economic value of all natural resources used in craft production (Terry, 1999). In Etsha and Gomare/Tubu villages, basket-weaving provided self-employment to 1 500 and 400 women, respectively, in the 1980s (Terry, 1987). Currently, Botswana Craft and Botswana Christian Council are the main buyers of baskets in the Okavango sub-District. In 2000 and 2001, Botswana Christian Council spent P336 000 and P400 000, respectively on the buying of baskets in this sub- District (Botswana Christian Council, 2002). On the other hand, Botswana Craft spends P300 000 annually on the buying of baskets in this area (Botswana Crafts Marketing, 2002).

The raw materials used for the production of baskets are leaf fibre and dye, and these resources are held under an open access management regime in communal areas. The fibre is obtained from the leaf blades of the juvenile palm tree, *Hyphaene petersiana (mokola, mbare)*, mainly found in the islands of the Okavango Delta. The dye for *mokola* bark is mainly obtained from the roots of the trees of *Euclea divinorum (motlhakola, mushetondo)* and *Berchemia discolor (motsentsila, mokerete)* (Cunningham, 1988). These are the most preferred species for dye because they have a dark colour preferred by the buyers because it adds quality to baskets, as they are unlikely to fade when the dye is used (Cunningham and Milton, 1982).

In the pre-independence period, there were rules and sanctions for the management of basket-weaving resources in some areas in Ngamiland. According to Bishop *et al* (1994), in the islands of Wabe and Qoroga near Etsha, there were rules for regulating the harvesting of *Hyphaene petersiana* and for excluding others from harvesting these resources in the 1950s and 1960s. It is, however, not clear whether such rules resulted in effective management of these plants or not. In the 1990s, such rules and sanctions were not practised, and this contributed to the depletion of dye resources in the early 1990s (Bishop *et al*, 1994). However, in the islands of Oxge near Danega, the village headman had introduced rules for harvesting *Hyphaene petersiana* in the 1990s, and basket-makers were advised not buy the fibre harvested by hoes or axes, as these devices are not selective, and therefore more destructive to the plant. These rules and sanctions were effective in managing the palm resources (Bishop *et al*, 1994).

Commercialisation of basket-making has resulted in the scarcity of raw materials used for producing baskets in the Okavango Delta region (Terry, 1999, Cunningham, 1988, and Kgathi, Motsholapheko and Ditsheko, 2002). In the villages of Etsha and Gomare/Tubu, 97% and 55% of basket-makers, respectively, complained about the scarcity of fibre leaves for *Hyphaene petersiana* in 1983 as they travelled longer distances than in the past (Cunningham, 1988). This had an adverse effect on productive and reproductive activities such as agricultural work and household chores, respectively (Cunningham and Terry, 1993). Terry (1986), also notes that more that 55% of the respondents said there was

scarcity of fibre leaves for *Hyphaene petersiana* in Gomare/Tubu in 1983 as compared to 97% in Etsha. Species for producing dye were also perceived to be increasingly becoming scarce. For instance, 79% of basket-makers in Etsha perceived the scarcity of *Berchemia discolor* dye resources in 1983, as compared to 57% of the basket-makers in Gumare/Tubu in 1985.

The scarcity of the raw materials for making baskets seems to be at present worse than in the 1980s. An interview of basket-makers who attended a workshop (10/11/2002) organised by the Kgalagadi Consevation Society in Etsha 6 in the Okavango sub-district, aimed at exchanging views with basket-makers and craftsmen about conservation issues, indicated that the scarcity of basket-making resources had become worse. Basket-makers who were based in Etsha 6 said that they currently collected the raw materials in Jau which was estimated to be more than 10 kms. The monthly labour time for the collection (travel and extraction) of the raw materials for producing 3 baskets worth P225 was 12 hrs. The labour time for collecting the same resources was 3 hours as far back as in 1984. As a result of the destructive harvesting methods, most of the resources were depleted in areas close to Etsha 6. Further analysis of the "Every River Has Its People" research Project questionnaires revealed that most of the households interviewed in Etsha 6 (44%) thought that over-harvesting of palm trees was the main cause of their depletion. The remainder thought the destruction by elephants (32%), lack of rainfall (16%), veld fire (8% and high temperatures (4%) were the causes of the depletion of palm trees (Kalahari Conservation Society, 2002).

	Matsaudi Number	%	Shorobe Number	%	Total Number	%
Scarcity	6	42.9	10	62.5	16	53.3
No Scarcity	8	57.1	6	37.5	14	46.7
Total	14	100	16	100	30	100

Table 2: Perceptions of basket Weavers about scarcity of Palm Resources

Source: Kgathi and Motsholapheko, 2002

Our recent survey on basket-making resources in the lower part of the Okavango Delta revealed that 63% of the basket-weavers in Shorobe perceived the scarcity of raw materials from palm trees (Table 2). However, the scarcity for these raw materials was perceived by only 43% of the weavers in Matsaudi, reflecting the reduced pressure on this resource in this village. The raw materials for dying the palm leaves were reported to be very scarce in both Shorobe and Matsaudi, and hence 79% of the weavers purchased them (Kgathi and Motsholapheko, 2002). Almost al the weavers (89%) said they collected their most preferred dye species, and these were not easily substitutable. An analysis of the questionnaires for the "Every River Has its People" research project

revealed that the decrease in the availability of palm resources was mainly attributed to the destruction by elephants by 56% of the respondents. Other reasons given for the decline in the availability of the palm trees were over-harvesting of the resource (17%), lack of rainfall (17%), and veld fires (11%) (Kalahari Conservation Society, 2002).

Water Resources

The Botswana National Water Master Plan revealed that 35% of the total water supply is from surface water, whereas the remainder (65%) is from groundwater (SMEC *et al* 1991). Water resources are the property of the state which has the responsibility of its allocation (Arntzen, Kgathi, & Segosebe, 1999). The allocation of the land for drilling boreholes is done by the Land Board, whereas the issuing of water rights is the responsibility of the Water Apportionment Board (Arntzen, Kgathi, & Segosebe, 1999). The Land Board allocates the land for boreholes by installing pegs which show the centre of the cattlepost, and the applicant is then required to drill a borehole within a one km from the peg. If water is not found within the area, the applicant can approach the Land Board for an extension of the one km area. If water is found in the extended area, the law requires that the water should be "reticulated back to original one km radius" (CCI, 1997 p12). This is done in order to reduce environmental degradation by avoiding a high concentration of cattle between boreholes, which should be 8 km apart (CCI, 1997).

The Okavango river is an important source of surface water resources in Okavango Delta region, and these resources are generally held under an open access regime. A recent survey undertaken by the Applied Research Consultants (2001) in the Okavango Delta revealed that almost all the households in the area collected water directly from the Okavango river system. As expected, the proportion of riparian households who used water for domestic purposes (75%) was higher than that for the non-riparian (25%). Water is used for various purposes such as cooking, washing, livestock watering, and flood recession arable agriculture. Farmers usually plough their crops in the areas where the floods have receded in order to utilise the available moisture. The crops also benefit from the water vapour flows. Thus, farmers benefit from the Okavango Delta by using "blue water" (liquid water) and "green water" (water vapour flows) for basic needs and development purposes (Fakenmark, 2000). Benefits such as those from "blue water" are referred to as "direct use values" (Pearce, 1993).

Like in other parts of rural Botswana, the people of the Okavango Delta in Botswana also depend on groundwater sources. In urban areas, water supply is the responsibility of the Department of Water Affairs. The urban village of Maun experienced critical water shortages in the 1980s as result of the low floods of the Okavango Delta which led to low groundwater levels. This led to a freeze in private water connections (Arntzen, Kgathi, & Segosebe, 1999). Boreholes and hand dug wells are usually the sources of groundwater in remote rural villages, cattleposts and agricultural settlements (*masimo*). A survey undertaken in Sehitwa area revealed that 65 % of the owners of boreholes and hand-dug

wells had obtained them through the Land Board, whereas 22% and 10 % had obtained them through inheritance and purchasing, respectively. The remaining owners (1%) had obtained the boreholes and wells through other means (Fidzani, 1998). The respondents thought that the water from these sources was good enough to drink, even though it tended to be "blackish and salty" (Fidzani, 1998 p15).

While grazing is generally open access in communal areas of Ngamiland, as in the rest of Botswana, the areas around boreholes are often subjected to *de facto* control (Sethebe, 2002, pers Comm.). This is a form of privatisation of the commons as the resources in this land are for exclusive use. In other parts of Botswana, some of the borehole owners even go as far as fencing the the area around boreholes. The implication is that the grazing resources in these areas are more utilised by borehole owners since other farmers cannot establish cattle posts nearby, and this exacerbates grazing pressure. Commenting on the *de facto* privatisation of land in Botswana, Peters (1983 p24) thinks the communal areas are "neither a commons, nor a series of commons, nor an area that has been reduced to common access but rather they have been led to a situation where there are unequal claims to a supposedly common resource"

4.2 Wildlife Management Areas

4.2.1 Patterns of land use and management

The "Wildlife Conservation Policy" of 1986 established WMAs as a primary form of land-use. The policy permits other forms of land-use in WMAs provided such use is compatible with wildlife utilisation (Republic of Botswana, 1986). WMAs were previously zoned as "reserved land" for the Tribal Grazing Land Policy, but they are now primarily used for wildlife utilisation and management (Gujadhur, 2001). WMAs and other areas in Botswana have been divided into smaller units called Controlled Hunting Areas (CHAs), and these are "administrative blocks used by the DWNP to administer" the land for sustainable wildlife utilisation (Republic of Botswana, 1986 p12). There are 163 CHAs in the country (Gujadhur, 2001), and those in WMAs can be categorised as follows: community multipurpose (hunting/photographic), commercial multipurpose, community photographic, and commercial photographic (DWNP, 1999).

The revised Land Use and Development Plan for Kwando and Okavango subdivided two WMAs into seven multiple use, eight photographic, and six community Use CHAs (Ngamiland District Council, 1997). The plan divided the area into three zones, based on the nature of wildlife utilisation. The first is referred to as the core zone of minimum utilisation. It is surrounded by the second buffer zone for non -consumptive utilisation of wildlife resources. The buffer zone is in turn surrounded by the third zone of consumptive utilisation. The plan laid down the conditions and principles under which CHAS would be used in a sustainable manner (Van der Heiden, 1991).

4.2.2 Resource user rights and Access to natural resources

Communities that form a "representative and accountable entity" and those who live in or adjacent to WMAs can apply for a "head lease" to hold user rights in their area or CHAs so designated for either consumptive or non-consumptive wildlife utilisation. The lease is for the use of wildlife resources but not for the use of the land and other natural resources (Rozemeijer and Van der Jagt, 2000). The communities can in turn sub-lease part of their area to the Safari Companies (Republic of Botswana, 1992; Gujadhur, 2001). To be able to apply for a lease, communities must be legally registered as a trust (DWNP, 1999; Gujadhur, 2001). Trusts and other organisations whereby members of the community come together to undertake a project are usually known as Community Based Organisations (CBOs) (DWNP, 1999). In theory, trusts are supposed to represent the interests of the community in CBNRM projects, and also manage the projects on their behalf (Republic of Botswana, 1999). Community leases in CHAs have a tenure of 15 years which is renewed after every five years. The sub-leases to the safari companies used to be on short contracts of two one-year, one three-year and two five-year periods designed to protect the inexperienced communities from being trapped in bad contracts for a long period (Gujadhur, 2001). As from this year (2002), they are now on three-5 year contacts. Table 5 shows that the tenure periods for community leases has a much shorter period than those for residential and common law plots.

TT	D · 1			
Use	Period	Conditions		
CBNRM	15	 Use rights for wildlife Land can be sub-leased to safari operators Renewed after every 5 years 		
Desidential Dista	In J. Cinita	 Description in the set of the s		
(residential)	Indefinite	 Property can be sold only to citizens 		
Residential Common	99	 Property can be sold to citizens and 		
Law Lease		non-citizens		
Commercial	50	 Property can be sold to both citizens 		
Common Law Plots		and non citizens		

Table 3: Tenure Periods for use of Land for CBNRM, Residential, and Common Law (Years).

Sources: CCI (1997); Cassidy (2000) and Ntingane, 2002, Person Comm.

The communities are concerned that the tenurial rights given to them by the Land Board are insecure in that the 15-year period is too short to encourage them to "act as real owners of the land and invest in its management and utilisation" (Gujadhur2001 p19). The safari operators are also concerned about the insecurity of their resource user rights (Mvimi, 2000; Gujadhur, 2001). Firstly, they contend that the system of renewing the contracts after short-duration periods does not allow them to make long-term investments. Secondly, resource user rights are insecure because they are only over the use of wildlife resources, and not over the use of the land and other natural resources

(Cassidy, 2000; and Murphree, 1995). As already stated, tenurial rights, whether in the form of ownership or user rights, need to be secure, well-defined, and enforceable, in order for economic projects to achieve sustainable resource management (Panayotou, 1993 and Mahammed-Katerere, 2001). Murphree (1995) refers to secure property rights as "strong property rights", their weakness or strength being determined by the tenure period and the 'conditionalities attached to it'. Using this terminology, secure user rights will, in this paper, be referred to as "strong user rights" and insecure user rights as "weak user rights". Murphree (1995) is of the view that the long-term sustainability of CBNRM programmes in southern Africa will be determined by the extent to which the property rights over the use of natural resources are strengthened

In communities involved in CBNRM, the control of wildlife resources is conferred on local communities in order to achieve sustainable rural development by restoring historically lost rights over the use of wildlife resources (Rihoy *et al*, 1999). Access to hunting in WMAs is based on community hunting system rather than on the system of individual hunting licenses (Cassidy, 2000). The hunting quota license gives the communities the right to use their CHAs (Cassidy, 2000). They are empowered by the lease to exclude others and to regulate the use of this resource (Cassidy, 2000 and Gujadhur, 2001). In other words, this resource is to some degree managed under a common property resource management regime in community CHAs (Rozemeijer and Van der Jagt, 2000).

Access to natural resources depends on whether the CHAs are under multi-purpose management or photographic management (Cassidy, 2000). In multi-purpose CHAs, traditional hunting is allowed if it is carried out with traditional weapons, whereas subsistence hunting shall only be allowed in designated areas (DWNP, 2000). Commercial exploitation of non-wildlife resources (eg veld products) is prohibited, but the traditional rights over their use are recognised as communities are allowed to collect or use them for subsistence purposes (Van der Heiden, 1991). However, access to non-wildlife resources is unrestricted (Rozemeijer & Van der Jagt 2000; Pearce & Barbier 2000).

Type of CHA Type of use	Photographic	Multi-purpose
Traditional hunting	Not allowed	Draft WMAs guidelines stated that it will be allowed only With traditional weapons
Subsistence Hunting	Not allowed	Draft WMAs guidelines state that it will be allowed in designated areas

Table 4	Regulations	for natural	Resources use	in V	VMAs
aut 4.	Regulations	101 matural	Resources use	/ III \	VIVIA5

Collection of veld- products	Allowed	Allowed
Subsistence fishing	Allowed to communities in leased areas	Allowed
Commercial harvesting of veld products	Not allowed to communities in leased areas	Not allowed
Rearing of domestic animals	Not allowed	WMAs are Stock free zones

Sources: Ecosurv (20000), van der Heiden (1991), and Cassidy, 2000.

In photographic CHAs, lease-holders are given exclusive rights over the use of the area for tourism and other commercial uses in the area, but they are not allowed to make these areas private property regimes (Ecosurv, 1996). Subsistence hunting is prohibited in these areas. However, traditional resource rights such as those of the collection of veld products and fishing for subsistence purposes are recognised (Van der Heiden, 1991; Ecosurv, 1996 and DWNP, 2000). However, there is evidence that these rules are not strictly followed in practice as the local communities are sometimes not allowed to fish or collect veld products in concession areas (Ramberg & Van der Waal, 1997). The construction of lodges and camps in photographic CHAs is allowed, but it should not have aesthetic, ecological, or physical adverse impacts. In addition, the rearing of domestic animals and the planting of exotic plants are not allowed (Ecosurv, 1996).

The draft regulations for WMAs state that the Director responsible for the DWNP may designate certain areas for certain land-use types. These include areas for the collection of veld products for subsistence or commercial purposes as well as for arable farming. In addition, there will be livestock and development free areas (DWNP, 2000). Although these regulations are not yet approved, some of their principles are already being applied by the policy-makers for the management process (Modise, 2002, pers Comm.).

In CHA, NG 32, under the control of Okavango Kopano Mokoro Community Trust (OKMT), the communities have rules for regulating and sanctioning the use of thatching grass. According to the established rules, this grass can only be harvested in June after the new seeds have ripened and their dispersal has taken place (Tshekonyana, 2002, pers comm). Thatching grass is not only collected for traditional use, but also for sale to tour operators and other members of the community. It has a high demand as roof material for traditional and modern houses as well as for tourist lodges (Bolaane, 2000). According to the information stipulated on the OKMCT board at the entrance of the buffalo fence in Daonara, there is a need to obtain a permit from the Board of Trustees in order to harvest thatching grass and other resources such as firewood and reeds in the areas of NG 32 inside the buffalo fence. The permit is obtained free of charge, and is meant to sanction the amounts of natural resources collected. The collection of large amounts of these resources is not allowed (Tsaro, 2002, pers comm). There are gate-

keepers at the entrance of the buffalo fence who ensure that the stipulated rules are followed.

Similar restrictions also occur in Khwai, situated in NG 18, where there are rules for regulating and sanctioning the harvesting and sale of thatching grass in Khwai.. According to Bolaane (2000), the rules were introduced by the Khwai community before the implementation of the CBNRM programme in order to generate incomes in the village. According to the established rules, the grass can only be harvested in June when the process of seed dispersal has taken place. However, the only problem is that the sanctioning only applies to the Khwai community, and there is no mechanism for excluding outsiders (Bolaane, 2000). Thus, the management regime under which the grass is held in Khwai is neither an open access nor a common property resource, but rather a mixture of the two regimes.

Moremi Game Reserve

Game reserves and national parks account for 6.4% of the tribal land in Ngamiland. They include Moremi Game Reserve and Nxai Pan National Park. This study focuses on the former since the latter is not located in the study area. According to Spinage (1991), game reserves can legally be created on any land by a Presidential Notice. They are legally meant to protect the animals and not the land on which they exist. However, the Minister in charge of national parks and game reserves has the power to make regulations for protecting the land (Spinage, 1991). In practice, however, game reserves have been created on tribal land in Botswana. According to Government policy, game reserves are "areas set aside for the total preservation of natural and scenic features of national and international significance for scientific, educational, cultural and recreation purposes" (KCS & KGS, 1991 p8).

On the other hand, national parks are legally meant to protect the land and its natural resources. They can be created by a Presidential Order on state land or "any land bequeathed or donated to him or to any other person, to be a national park" (Republic of Botswana 1992 pA.124). Though in legal terms, a distinction is made between national parks and game reserves in terms of the development of wildlife and the land in them, in practice they are given the same treatment in Botswana as the land in the latter is also protected like wildlife (Selitshena & McLeod, 1998).

The Moremi Game Reserve was established in 1963. It was then known as Moremi Wildlife Reserve, and administered on behalf of the tribal authorities by Fauna Preservation Society (FPS) of Ngamiland, an affiliate of the then Fauna Preservation Society of London (KCS & KGS, 1991). In 1976, the reserve was extended to "Chiefs Island and its surrounding floodplains" (KCS & KGS, 1991). The administration of the Moremi Wildlife Reserve by FPS was terminated by the Presidential Directive CAB 25/79 on the 8th October 1979, and the regulations of the Moremi Game Reserve were to be published to allow the Government to administer it on behalf of the Tawana Land Board (KCS & KGS, 1991).

The declaration of Moremi Game Reserve in 1963 led to the displacement of the people who used to live in the reserve. Those displaced by the reserve settled in what is today known as the village of Khwai, and they are mainly the Bagakhwe or River Bushmen (Taylor, 1999 and Bolaane, 2000). According to Taylor (2001), those displaced by the creation of the Moremi Game Reserve ceased to have control and access to the veld products and wildlife resources. In addition stricter hunting regulations were introduced, "legally alienating Basarwa further from a resource that they had used for generations" (Taylor, 2001 p6). The literature is silent as to whether these communities were consulted before they were resettled and also compensated for the loss of their resource user rights. According to Mohamed-Katerere (2001, p22), the resource user rights of communities are not supposed to be extinguished, and if they are there should be proper consultation and compensation should be done.

4.3.1 Management and Access

The National Parks and Game Reserve regulations state that there is need to prepare management plans in order to facilitate the management and development of the national parks and game reserves. The management plans prepared for national parks or game reserves located on tribal land are supposed to be approved by the Director of the DWNP and the relevant Land Board (DWNP, 2000).

The management plan for the Moremi Game Reserve was prepared as far back as 1991 in close liason with the land-use plan for the Kwando/Okavango WMAs. The plan divided the Moremi Game Reserve into two parts designated as the Tourism Development Zone (TDZ) and the Wilderness Zone (WZ). In the former, the land would be primarily used for tourism and the appropriate infrastructure would be built. In the latter, there would be limited human interference. Vehicles and boats would not be allowed and development activities would not be undertaken (Kalahari Game Services, 1990). Although this plan was written in 1991, it has not been approved (Modise, 2002, pers com.), and the DWNP attribute this to the failure to undertake sufficient consultation during its preparation (DWNP, 1996)). However, some of the elements of the management plan have been implemented (Modise 2002, pers. comm). For instance, the recommendations on the zoning and reduction of over-crowding of tourist facilities in the reserve have been adopted.

Category of visitors	Moremi Game	Chobe National	Makgadikgadi/
	Reserve	Park	Nxai Pan
			National Park
Private Self-drive	8141	14 050	25 030
Mobile Tour Operators			
Clients	8521	12 280	698
Fixed Camps/Lodges			
Clients	14 173	40 670	54 843

Table 5 : Protected Areas Visitor Statistics in 2000

Source: DWNP (1996),

Photographic tourism, the main form of land-use in Moremi Game Reserve, may be formal or informal in nature. In the case of the former, tourists may find accommodation in fixed lodges and camps or tourism activities may be organised by tour operators. In the case of the latter, tourists drive themselves to do game viewing in the reserve.

According to the National Parks and Game Reserves Regulations, no person is allowed to enter a national park or game reserve without a permit, and a fee is charged for this permit. However, certain categories of people are exempted from paying this fee such those living in communities nearby, persons who are in transit, and those employed by the Government who may be living in a national park or game reserve or on official duty (Republic of Botswana, 2000). The guidelines also mention that community use zones will be created in certain areas in order to cater for the needs of communities living inside or adjacent to national parks or reserves (Republic of Botswana, 2000). The regulations further state that the zones could be used for commercial non-consumptive tourism and sustainable harvesting of veld products. According to Modise (2002, pers Comm.), such zones have not yet been designated in Moremi Game Reserve, but they have already been suggested in the draft management plan of the Chobe National Park (Republic of Botswana, 2001). This is a step in the right direction, though it will not heal the wounds of the past resettlement and alienation of the communities from their original homes.

In 2000, there were 8 521 and 14 173 clients for the mobile tour operators and fixed camps and lodges in Moremi Game Reserve, respectively. They accounted for 28% and 46% of the total number of tourists who visited Moremi Game Reserve in the year 2000, respectively. The proportion of the clients for mobile tour operators who visited Moremi Game Reserve exceeds that of the clients who visited the Chobe National Park and the Makgadikgadi/Nxai Pan National Park (Table 5). However, the proportion for the private self-drive tourists exceeded that for the Chobe National Park, but was less than that of Makgadikgadi/Nxai Pan National Park (Table 5).

4.4 TGLP Ranches

The TGLP ranches account for 6.4% of the total land in Ngamiland. As Figure 1 shows, these farms are located in Hainaveld. The establishment of the TGLP ranches led to the displacement of people who were living in them, and the assumption that the areas zoned for these farms were unused open lands has been proved to be wrong (Tsimako, 1991). Communal service centres have been established for the displaced people, and two ranches were set aside for this purpose in Hainaveld (Ngamiland District Council, 1997). Communal service centres will not solve all the problems faced by the displaced people. One of the main problems is that the displacement of communities from their original lands may lead to the extinction of traditional knowledge which they may have acquired over generations (Mohamed-Katerere, 2001).

Most of the farmers with TGLP farms in Ngamiland, as in other areas in Botswana, have dual grazing rights particularly during periods of drought (Sethebe, 2002, pers Com). In other words, those who own TGLP ranches still graze their cattle in communal areas. This practice exacerbates grazing pressure in communal areas and also creates a disincentive for the adoption of sustainable management practices (Tsimako, 1991). The resources in TGLP ranches are exclusively used, hence they are private property.

5.0 Summary and Conclusions

This paper examines the dynamics of natural resources tenure in Botswana's Okavango Basin, with particular reference to communal areas, WMAs, Moremi Game Reserve and TGLP ranches. We now summarise the issues raised in this paper and suggest some policy recommendations.

5.1 Summary

5.1.1 Communal Areas

The predominant management regime in communal areas is open access. Resources such as grazing, fish, veld products and surface water, are held under this tenure regime. However, the land for agricultural, residential and groundwater resources is held under different management regimes. The tenure regime for arable agricultural land depends on the type of farming system. There are two main arable farming systems of dryland and flood recession (*molapo*). The former is allocated by the land board and the user has the right to exclude others. The latter is allocated by title holders. These are the descendants of the pioneer farmers in the area concerned. The title-holders have, therefore, inherited the right to allocate land from their ancestors. They may either lend a field without any obligation, or ask the borrower to pay in kind by providing his/her labour services to their field.

Basket-making resources are among the most valuable natural resources in Ngamiland. These resources are held under open access, and therefore free for all. The rules and sanctions for harvesting these resources, which existed in the past, are no longer in existence. The commercialisation of this resource has resulted in income generation to basket weavers, who are all women. However, it has led to increased scarcity of basketweaving resources.

Land for groundwater resources is allocated by the land board, but the issuing of water rights is done by the Water Apportionment Board. Boreholes are a private property and are therefore used exclusively. The users have *de facto* control of the use of the land around boreholes, a practice that is usually described as "privatisation" of the commons. This practice contributes to grazing pressure in communal areas, and has an adverse impact on the livelihoods of the poor farmers who mainly graze their cattle in communal areas, and do not usually own boreholes, but depend on surface water for watering their cattle..

5.1. 2 Wildlife Management Areas (WMAs)

WMAs were introduced by the Wildlife Conservation Policy of 1986 as a form of landuse. Although these areas are primarily designed for wildlife, other forms of land-use are permitted, provided they are compatible with wildlife use. WMAs and other areas in Botswana have been divided into smaller units called Controlled Hunting Areas (CHAs). These are administrative blocks that are used by the DWNP to manager wildlife resources in a sustainable manner.

Communities which live near or adjacent to WMAs are allowed to form trusts, and to apply for a "head lease" in order to hold user rights for wildlife management in their area for consumptive or non-consumptive wildlife utilisation. The lease has a tenure period of 15 years, renewable after every five years. The communities can sub-lease part of their area to safari companies. There were a total number of 12 community trusts in Ngamiland in the year 2000, and most of them had joint venture-contract agreements with the private sector. The main problem faced by community trusts is that the tenurial rights given to them by the Land Board are weak in that 15 year tenure period is too short to make any meaningful investments in the land. In addition, the resource user rights are for wildlife use and not for other natural resources.

Finally, the rules stipulated in the lease agreements are not always followed. Although, concession areas are not meant to be used as private property, the safari operators sometimes restrict the local communities from collectiong veld products or fishing for subsistence purposes. In some CHAs, communities have rules for regulating and sanctioning the harvesting of natural resources with a commercial value such as thatching grass.

5.1.3 Moremi Game Reserve

Moremi Game reserve was established in 1963. Its establishment led to the displacement of the people who lived in the area. They settled in the village now known as Khwai. Currently, the main form of land-use for Moremi Game reserve is non-consumptive tourism. The National Parks and Game reserves regulations do not allow people to enter these areas without a permit. However, those who live nearby or in transit or under the employ of the Government are exempted. The Government intends to establish community use zones in order to cater for the needs of the nearby communities.

5.1.4 TGLP Farms

The establishment of TGLP farms led to the displacement of people who lived in this areas. This led to the creation of community service centres meant to cater for the needs of these people. Displacement of people from their ancestral lands may lead to the extiction of traditional knowledge systems and other important values. The farmers who hold TGLP farms have dual grazing rights in these farms and in communal areas. This practice exacerbates grazing in communal areas.

5.2 Policy Recommendations (Tentative)

- There is a need for the Land Board to take over the allocation of land for *molapo* farming as this farming system is characterised by inequalities in the control of the resource as well as pollution of water resources.
- The collectors of weaving raw materials need to pay a small fee to the Government in order to take account of the externalities associated with the harvesting of these resources. The money may re-invested in conservation projects for these resources.
- There is need to take cognisance of the traditional rights of local communities when establishing ranches or protected areas. The local communities should be consulted about the idea, and if they refuse to move out, they should be left alone. If they agree to move out, they should be fully compensated for the loss of their resource user rights.
- Community use zones should be established as soon as possible in Moremi Game Reserve in order to cater for the needs of the local communities.
- The dual grazing rights associated with farmers who own TGLP farms, and the *de* facto control of the land around boreholes by large farmers, should not be encouraged as these practices aggravate grazing pressure in communal areas, and the poverty of the small cattle farmers.

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