



REPUBLIC OF BOTSWANA

**LAND USE AND DEVELOPMENT PLAN
WESTERN COMMUNAL REMOTE ZONE**

-Planning Zone 6-

Ngamiland West



**Ngamiland District Land Use Planning Unit
Okavango Sub-District Land Use Planning Unit
Working Group Western Communal Remote Zone**

Maun, March 1994

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Okavango Sub-District Land Use Planning Unit
Working Group Western Communal Remote Zone

List of abbreviations

ALDEP	Arable Lands Development Programme
AH&P	Animal Health and Production
APO	Assistant Project Officer (RADP)
BCC	Botswana Christian Council
CHA	Controlled Hunting Area
CJSS	Communal Junior Secondary School
CP&F	Crop Production and Forestry
CSDA	Communal Second Development Area
DHT	District Health Team
DDP	District Development Plan
DLUPU	District Land Use Planning Unit
DOD	District Officer Development
DOL	District Officer Lands
DTRP	Department of Town and Regional Planning
DWNP	Department of Wildlife and National Parks
DWA	Department of Water Affairs
FAO	Food and Agriculture Organization
FMD	Foot and Mouth Disease
GSD	Geological Survey Department
IFS	Integrated Field Services
LAC	Livestock Advisory Centre
LUO	Land Use Officer
LUP	Land Use Plan
LUT	Land Utilization Type
MLGL	Ministry of Local Government and Land
MOA	Ministry of Agriculture
NCS	National Conservation Strategy
NMMAG	National Museum, Monument and Art Gallery
NDP	National Development Plan
NGO	Non Governmental Organization
NRMP	Natural Resources Management Project
NWDC	North West District Council
RAD	Remote Area Dweller
(P)RADO	(Principal) Remote Area Dweller Officer
RADP	Remote Area Dweller Programme
TA	Technical Assistant (MOA)
TGLP	Tribal Grazing Land Policy
VA	Veterinary Assistant (MOA)
VDC	Village Development Committee
WG-WCRZ	Working Group Western Communal Remote Zone
WMA	Wildlife Management Area

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PREFACE

The process of land use and development planning for the Western Communal Remote Zone was accomplished in an integrated approach. Local authorities and government departments were involved and extensive consultation with local communities and sectoral experts took place.

The Working Group Western Communal Remote Zone specially likes to thank the members of the Tawana Land Board and the councillors of the North West District Council for acknowledging the fact that this plan was made with and for the people who actually live in this remote zone.

Of course, we want to thank all the people who came to the various Kgotla meetings to discuss issues and to have their say. We hope that they will be committed in actually implementing the various ideas and that they themselves will stand for development of the area.

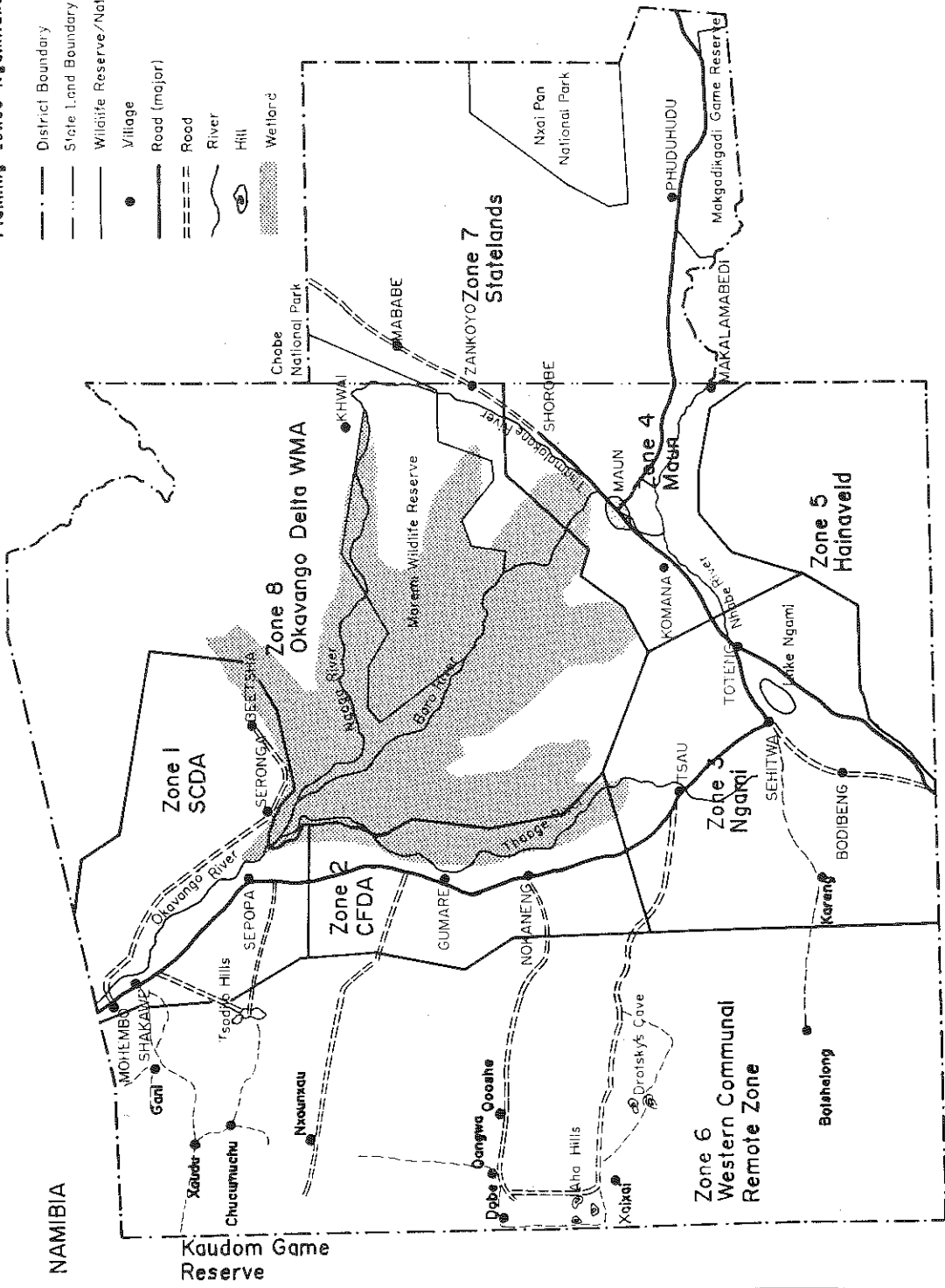
Now that the plan has been approved it is time to make sure that this plan is implemented and that the people from the remote zone will be able to fully benefit, not only from the present resources but also from the developments stimulated by Council, government departments, private businesses and non-governmental organizations.

Planning Zone 6 is a very remote zone, but with joint efforts we can ensure prosperity for all.

Thank You.

**Map 1:
Planning zones Ngamiland District**

- District Boundary
- - - State Land Boundary
- ▨ Wildlife Reserve/National Park
- Village
- == Road (major)
- Road
- ~ River
- ▲ Hill
- ▨ Wetland



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SUMMARY

Introduction

In order to come to land use and development planning in Planning Zone 6, the Sub-DLUPU for Okavango Sub-district formed a Working Group Western Communal Remote Zone in 1991. In 1992 the socio-economic situation was assessed (Smit and Kappe, 1992) and an inventory of the natural resources and their utilization was made (van der Sluis, 1992).

Following these two studies, extensive consultations were held with local communities in order to discuss various development issues and to come to a land use and development plan for each village area. Finally resulting in this Land Use and Development Plan WCRZ which was approved by the Tawana Land Board on the 9th of February 1993 and subsequently accepted by the North West District Council on the 25th of August 1993.

Planning framework

The political and economic context for the Land Use and Development Plan is given by various governmental policies. To ensure that this plan is in accordance with these policies an inventory was made of the various policies. Based on these policies a development strategy for the Western Communal Remote Zone was formulated. This strategy aims at the following:

- a. Sustainable use of the natural resources;
- b. Diversification of the resource base;
- c. Improvement of food security at household level, especially for the most marginalized households;
- d. Employment and income generation within the Western Communal Remote Zone.

It is thought that these objectives can be achieved through the following:

- a. Preservation of natural resources to halt further land degradation;
- b. Development of under-utilized resources;
- c. Development of rural industries focusing primarily on local available resources;
- d. Non-conflicting multiple utilization of resources in one area;
- e. Segregation of conflicting resource uses;
- f. Commercialization of the livestock sector;
- g. Improvement of access to land and its resources, especially for the Remote Area Dwellers.

Existing development projects and land use plans

Due to the isolation, the low population densities and the limited resources very few plans were developed for this remote zone.

Government and District Council have provided some basic

services and facilities. These include water supplies, primary schools, adult education, health posts, mobile health services, tribal administration and extension activities. Further on the National Museum and Art Gallery is preparing a management plan for the National Monuments Tsodilo Hills and Qwihaba Caves.

Land evaluation

A land evaluation was carried out in order to define what the best land use potential is in the Western Communal Remote Zone. The land was evaluated for its suitability for arable farming and pastoral farming.

The evaluation shows that most of the areas in the Remote Zone are marginally suitable for grazing and ploughing. This confirms present land uses with low yields and low livestock offtake figures.

Land allocation, land use zoning and sectoral development plans

In principle it is not attempted to change present land uses or existing landrights. Instead, one of the aims of this report is to give Land Board some guidance in future allocations of land. Only when the residents think it is necessary, existing land use can be changed and all technical and financial assistance possible will be given.

Before a land use zoning plan for each village was prepared people in the respective villages were asked in a Kgotla meeting if they wanted such a plan. Except for Xaudum, Nxau-Nxau and Qangwa all village areas wanted such a plan in order to optimize land use, conserve veldfoods and decrease land use conflicts.

All land allocation should be done in line with the zoning plans and zoning guidelines as mentioned in chapter 4.

In line with the Tribal Land Act¹ all undeveloped waterpoints that were allocated more than five years ago will be withdrawn and new waterpoints can only be allocated in those areas where it is compatible with the land use zoning. The Land Board guideline should be adhered to that no waterpoint should be allocated within 8 km from natural waterpoints like pans or rivers and from other waterpoints like boreholes and wells. According to Land Board guidelines, no waterpoints should be allocated within 4 km from Veterinary Fences. A policy guideline from the Ministry of Agriculture is that kraals should be at least 4 km and villages at least 8 km from Veterinary fences.

The Tawana Land Board implemented a freeze on allocation of timber concessions on the 6th of October 1992. This freeze

¹The Tribal Land Act from 1968 has been reviewed; the new Act can be expected any moment; one of the proposed changes is that rights are relinquished after 3 years. Once the new Act is gazetted, this time limit should be used as the guideline for the Western Communal Remote Zone.

continues until a proper forest management plan has been prepared and approved.

The land is zoned in the following categories:

1. Mixed farming zone;
2. Arable farming and gathering zone;
3. Grazing zone;
4. Conservation zone;
5. Wildlife Management Area;
6. Residential zone.

Reference to chapter 4 is made for the exact regulations for each zone.

The Planning Zone 6 is divided in Controlled Hunting Areas NG 1 till NG 6. Boundaries are approved and will be gazetted in 1994.

All CHAs are zoned as community wildlife utilization, except for NG 2 (NxauNxau), which is zoned as Citizen Hunting and NG 6 (Tsodilo) which is zoned for Photographic use.

Human resources, social services and infrastructure

The area is divided in three sub-zones with one central vil-
lage/settlement each, based on existing interrelationships,
population figures, distance factors and resource utilization.
The planning of facilities is based on this settlement hier-
archy. Resettlement of people should not occur. It is only
proposed to resettle people from southwest Lake Ngami to the
southern part of Zone 6, in full consultation with them.

In view of the low population density, facilities and services
will be limited but some essential provisions will be created.
No tarred roads will be made for the time being, but some
existing roads will be upgraded. New airstrips will be made
and radio communication improved. In the long term all sub-
zone centres will be supplied with a two borehole water reti-
culation system; alternative water supply techniques will be
tried where water quality problems exist. The health facil-
ities are of a reasonable standard: only two more health posts
are required. Communication facilities are important for
health care. Low school enrolment and illiteracy necessitate
attention for education. Setting up of preschools, improvement
of RAD-hostels and more extensive adult education are some of
the proposals. Non-agricultural production activities will be
promoted, some of them linked to tourism. Finally, support
should be given to enhance local administration institutions
and social welfare activities like assistance to destitutes.

Village zoning and development plans

For each village (sub-zone) a detailed land use and develop-
ment plan is made. For each plan thorough consultations and
discussions were held with the local communities.
Development issues were identified and will be adressed either
in this Land Use and Development Plan or in the implementation
phase of this plan.

Further research

Research in future time must emphasize on the various resources in the Western Communal Remote Zone: livestock, forests, veldproducts, vegetation, beekeeping and wildlife numbers in the Wildlife Management Areas. The 'Forest Programme for Botswana' could take a leading role in various aspects of the necessary research.

INTRODUCTION

In order to come to this Land Use and Development Plan for Planning Zone 6 (see map 1), the Sub-District Land Use Planning Unit for the Okavango Sub-district formed a Working Group Western Communal Remote Zone in 1991.

Although over the two, three years personal membership regularly changed because of transfers, the following local authorities and government departments were always represented: North West District Council, District Administration, Ministry of Local Government, Land and Housing and the Ministry of Agriculture (for personal membership see Appendix 1).

With the implementation of this land use plan the following objectives will be achieved:

- a. Natural resources are used in a sustainable manner;
- b. The resource base is diversified;
- c. Food security at household level, especially for the most marginalized households is improved;
- d. Employment and income generation have increased.

In 1992 two studies were undertaken to assess the socio-economic situation (Smit and Kappe, 1992) and to inventorize the natural resources and their utilization (van der Sluis, 1992). These studies resulted in the report 'Baseline Survey Western Communal Remote Zone (planning zone 6)-Volume 1 (van der Sluis, 1992).

In the next stage consultations were held in all villages, settlements and larger concentrations of people by the Council Planning Officer, the Senior RAD Officer, the RAD Officer, the District Officer Lands, the District Officer Development and the Land Use Officer.

Based on the research, the consultations and the discussions this Land Use and Development Plan-Volume 2 was developed. Important for the concepts of land use and development planning were the overall framework of national policies (ch.1) and the existing plans in the planning zone itself (ch.2). Further on it was needed to analyze the resources potential for the various land uses (arable farming and grazing) and to distinguish the various land use zones and formulate sectoral development plans (subsequently ch. 3 and ch. 4). Finally this resulted in a plan to develop human resources, social services and infrastructure (ch.5) and for each village area a land use zoning and development plan (ch.6). Although this report is finalized, further research is needed to ensure a sustainable development (ch.7).

This Land Use and Development Plan was approved by the Tawana Land Board on the 9th of February 1993 and subsequently accepted by the North West District Council on the 25th of August 1993. All proposals in this report were accepted. However, many councillors stressed their concern considering the proposal for fencing of communal land. Whenever this part of the plan will be implemented, extensive consultation with local communities and

local authorities has to take place.

After distribution of this report many people will say 'OK, this was the plan for the Western Communal Remote Zone, lets make a plan for the next planning zone'. The Working Group acknowledges that now starts the difficult task of implementing the plan and that this phase will demand a lot of energy. For this reason the Working Group will continue and try to ensure that all aspects of this plan will be implemented. Project documents need to be prepared, Land Board needs to implement the guidelines for land allocation and Council and various government departments need to provide funds.

CHAPTER 1: PLANNING FRAMEWORK

Introduction

The aim of this chapter is to provide the setting of the land use and development plan, the political and economic context and the main Government policies underlying this plan. For an overview of Government policy the District Development Plan and the National Development Plan VII are the obvious documents. In writing this chapter valuable use is made of the 'First draft Land Use and Development Plan Kwando and Okavango Wildlife Management Areas - April 1991 (DLUPU-Tawana Land Board)'.

1.1 National policies & existing development plans

Each NDP represents a comprehensive and definitive statement of Botswana's national goals and priorities. Development and refinement of policies in key areas occur continually and are reflected in Government White Papers that Parliament approves from time to time.

All the Government's policies are founded on Botswana's four national principles: democracy, development, self-reliance and unity. These principles are rooted in the traditional culture of Botswana and when applied together in practice they are designed to achieve 'kagisano' - social harmony.

In the light of the national principles and of its appraisal of Botswana's political and economic situation the Government has four main planning objectives, which do not have an order of priority:

- a. rapid economic growth;
- b. social justice;
- c. economic independence;
- d. sustainable development.

The Government of Botswana is determined to diversify the economy away from the present strong reliance on the mining industry. Wildlife and agriculture are seen as the two main resources that have growth potential in the rural areas. Government is committed to ensuring the growth of the rural economy and providing jobs and income. This is of special importance in view of the present high population growth rate, which is expected to raise the population from 1.3 million to 2.5 million people by the year 2010.

Although all Government policies and programmes have a direct or indirect bearing on this current plan, some policies are crucial for this plan and these are briefly discussed here. These policies are the Agricultural Policy (par. 1.1.1), Tribal Grazing Land Policy (par. 1.1.2), the Remote Area Dwellers Programme (par. 1.1.3), the Wildlife Conservation Policy (par. 1.1.4), the Tourism Policy (par. 1.1.5), the National Conservation Strategy

(par. 1.1.6), and the National Settlement Policy (1.1.7).

Paragraph 1.2 describes how these policies are incorporated in the concept of this plan.

1.1.1 National Policy on Agricultural Development (Government white paper no. 1, 1991

The agricultural policy has the following objectives:

- a. to improve food security at both household and national levels
- b. to diversify the agricultural sector production base for more income opportunities;
- c. to increase agricultural output and productivity;
- d. to increase employment opportunities for the fast growing labour force;
- e. to provide a secure and productive environment for those engaged in agriculture;
- f. to conserve scarce agricultural and land resources for future generations.

The government accords top priority to sustainability, resource efficiency and environmental compatible production systems and programmes.

The role of government in agriculture will be limited to provision of necessary services and infrastructure for efficient agricultural production.

Farmers should be encouraged to produce profitable crops (both food and non food) to initially reduce and eventually eliminate government subsidies.

The use of draught power will continue to be used by the majority of the farmers.

The population will be encouraged to conserve forest and range resources. Utilization of these resources will be carried out responsibly to minimise adverse effects.

Production cooperatives will be encouraged through provision of basic infrastructure like roads, dams and marketing facilities.

Government will remain to be responsible for prevention of nationally important diseases, through control of movement of animals and animal products and compulsory and free vaccinations. Vaccines and treatments will be sold to farmers through the Livestock Advisory Centres (LAC).

Detailed land use plans will be developed for each area. This will include zoning of land where individuals and communities be allowed to fence grazing land to improve livestock management and productivity.

Community fenced areas will be targeted for special government assistance. Fencing in these areas should be considered both as an economic assistance programme for poorer farmers and a land conservation and rehabilitation programme to protect the scarce range resources.

"In community fenced areas a detailed land use plan, for each area (...), in consultation with local authorities and communities will be developed."

1.1.2 Tribal Grazing Land Policy (Government white paper no. 1 of 1975)

The Tribal Grazing Land Policy (TGLP) of 1975, was an important policy. By zoning land for different purposes in the districts it sets the framework for all land use planning activities, including this plan.

Land was divided into communal land, commercial land and reserved land. Ngamiland District was one of the few districts that zoned land as 'reserved'.

Reserved land was regarded as unsuitable for commercial grazing or communal grazing, due to its fragile ecology (Rodgers, 1991) In fact, most of Zone 6 has been zoned as reserved land at that time.

1.1.3 Remote Area Dwellers Programme

At present the new RADs policy is still in its draft stages, consultations have not been finalized. Below some mention is made of the new policy.

A most relevant paper is the Presidential Directive CAB 28/87, which authorised the launching of the ARADP in most districts. General guidelines for implementation were given in an Appendix. The main purpose of the ARADP is the promotion of productive activities and the improvement of living standards in the remote areas. An important component is the security of the resource base for the remote area dwellers.

Since it was the main document available at the time of drafting the land use and development plan, this was used as a leading principle for these plans.

The most relevant (and wholly accepted) recommendations from the above mentioned paper are as follows:

- a. "Authorised researchers, assisted and guided by the District Land Use Planning Units will carry out as a matter of priority population and socio-economic surveys in the designated Remote Areas."
- b. "Land use surveys including soil investigations, will be conducted to determine and establish the amount of land required to ensure proper incorporation of the Remote Areas inhabitants' communal land needs now and in the future."
- c. "Assure the inhabitants of the Remote Areas of their rightful share of the communal land resources"
- d. "Establish properly planned settlements to accommodate all landless inhabitants of the Remote Areas to meet the necessary

demand."

- e. "MLGL should instruct the Land Boards to tell the inhabitants of the Remote Areas about their land rights and assist them to apply for land allocations."
- f. "As much as practicable settlement areas should be located as close as possible to Wildlife Management Areas."
- g. "Whenever possible hunting and gathering territories should be retained."
- h. "Suitable centrally situated spots in the catchment areas should be established for the promotion of the appropriate productive activities."
- i. "A broad development strategy must be worked out for each of the Remote Areas Communities in the various districts."
- j. "As much as practicable the necessary public services should be extended to the inhabitants of Remote Areas at an accelerated place."
- k. "The ideal policy of providing every settlement with two boreholes must be extended to the Remote Areas and in each of the catchment areas there should be at least one borehole."
- l. "Sectoral Ministries and departments will be required to provide the necessary and specialised extension services."

The new policy is still in its consultation stages, it still lacks detail on several issues. Relevant is a statement on resources utilization:

"Government will assist Remote Area Dwellers in establishing sustainable projects in veld products utilization, handicraft production, arable land management, livestock development, game ranching etc."

"In recognition of the fact that land is an important economic resource and also that it serves as a means of cultural identity, increased efforts will be made to improve Remote Area Dweller's accessibility to land."

"The running of Day Care Centres by the communities will be encouraged with Government support, to help prepare children for introduction to formal education."

1.1.4 Wildlife conservation policy (Govt. white paper no 1. of 1986)

This policy aims at promoting the proper utilisation of the wildlife resource of Botswana on a sustainable basis. The policy emphasizes the need to obtain a better 'yield' or economic return from land allocated for wildlife while at the same time ensuring the continuity of this resource. Rational and effective conservation and management programmes are, therefore, the essence of the policy. The specific objectives of the policy are:

- a. To realise the full potential of the wildlife resource which, in periods unaffected by drought, is running far below its sustainable yield capacity.
- b. To develop a commercial wildlife industry in order to create economic opportunities, jobs and incomes for the rural population and to enable more rural dwellers to enter the modern wage economy.
- c. To increase the supply of game meat as a consequence of the further development of wildlife commercial utilisation.

The various wildlife utilisation activities that will be introduced or modified are: non-safari hunting, safari hunting, culling and cropping operations, game farming/ranching, live capture, communal areas programme, game viewing, processing and sale of wildlife products, and exports and imports of animals and animal products.

The policy established another type of land use: Wildlife Management Areas (WMAs), for some of the rich Game habitats that lie outside the Parks and Reserves. WMAs differ from Parks and Game Reserves in that in the latter total preservation of the wildlife resource is practised, while in WMAs, on the other hand, sustained wildlife utilisation will be actively encouraged.

In WMAs, wildlife utilisation is the primary land use and other land uses are only permitted if they are compatible with it. The system of Controlled Hunting Areas (CHAs) is superimposed on the WMAs, a blanket approach for the whole country, aimed to facilitate the administration of hunting that also occurs outside the WMAs. Within the WMA the system of CHAs can be seen as a division into smaller management units.

Community wildlife utilization is one of the options through which the above mentioned aims might be reached. This is of special importance for those areas with a good wildlife resource, with communities living in the area itself.

Herein the community takes responsibility for the wildlife resource, they decide in which way they best use the resource, within the management guidelines for the area. It is a project wherein the community is the manager, not wildlife department or other departments.

The benefits (meat, wildlife products, revenues from hunting from

e.g. citizens or safari industry) go to the community. This should foster a different attitude towards wildlife and living in wildlife areas, and in the long term achieve conservation of the area with the wildlife resources.

1.1.5 Tourism policy (Govt. white paper no. 2 of 1990)

This first formulation of a tourism policy is issued for three reasons:

- a. In terms of government policies and priorities, the tourism industry has not been given due prominence in the past;
- b. The potential of the industry is growing at a rapid rate, so fast that it is now regarded by many as a possible generator of significant economic activity in many parts of the economy and the country;
- c. Batswana are not likely to benefit from realisation of the potential unless a new framework of policy is put in place.

Its main objective is therefore to obtain from the tourism resources of the country, on a sustainable basis, the greatest possible net social and economic benefit. Among the subordinate objectives, two stand out:

- a. to shift the mix of tourists away from those who are casual campers towards those who occupy relatively permanent accommodation;
- b. to increase substantially the financial returns from tourism to the people of Botswana.

The policy contains proposals for: the regulation of the industry, tourism concessions and related issues, taxation, fees, localisation, and a Government Organisation to implement the policy.

1.1.6 National Conservation Strategy (Govt. white paper no. 1 of 1990)

The National Conservation Strategy (NCS) is an attempt to coordinate the concerted efforts of both Government and private organisations to conserve Botswana's natural resources, upon which the country is dependent for both the development and diversification of the economy. The country is endowed with many natural resources, but its predominantly arid environment is fragile. Many of the development pressures being experienced are not without harmful environmental impacts. Several natural resources are threatened by pressures associated with rapid economic growth, which take little or no account of long-term effects on the environment.

With its national planning objective being sustainable development the Government has always been committed to the case that all development of renewable resources is to be undertaken on a sustainable basis. Against this background the primary goals of the Strategy are both to provide policy guidelines and to recommend measures which will:

- a. increase the effectiveness with which natural resources are used and managed;
- b. integrate the work of the many sectoral ministries and interest groups, so that all developments based on natural resources provide sustainable yields, minimise environmental/social costs and satisfy restoration and conservation needs;
- c. ensure that future generations have access to capital stocks of natural resources, at least equal to those presently available.

These primary goals provide the basis for a series of detailed strategy goals in two inextricably linked categories: development goals and conservation goals. An example of the former is the development of multiple, rather than single purpose, natural resources uses, while an example of the latter is the protection of endangered species.

Main points of the Strategy are to encourage economic diversification, economic incentives and disincentives, legislation reforms and provisions, planning and administrative measures, public awareness, improved education and training in its efforts to enhance natural resources conservation.

The main environmental issues and challenges identified by the NCS are the pressure on water resources, rangeland pasture degradation, depletion of wood resources, overuse of veld products, the industrial/urban pollution and urban enhancement, and the conservation of wildlife, heritage and cultural resources. For each of these issues 'solution packages' have been developed into an action-plan.

Administratively, a Natural Resources Conservation Board under the chairmanship of the Minister of Local Government and Lands, will be responsible for the implementation of the Strategy. The Board will be serviced by a small professionally-staffed secretariat, the NCS Coordinating Agency.

1.1.7 National Settlement Policy (DTRP, MLGL, May 1992)

The aim of the NSP is to provide in a responsive planning approach a policy direction geared towards spatially and equitable distribution of the country's investments and other benefits. A spatially balanced distribution of investment is essential for balanced national growth and the utilization of the country's scarce resources.

The establishment of a hierarchy of settlements would enhance the sustainability of individual settlements provided that the overall economic structure of any region is treated as a comprehensive system. Due to the different functions and roles played by settlements a three tier hierarchy based on Primary Secondary and Tertiary Settlement shall be maintained. The criteria for determining the settlement hierarchy is as follows:

- a. economic potential and employment generation;
- b. availability of natural resources such as water and food crops to sustain it;
- c. availability of infrastructure and services or the ease with which they can be provided;
- d. the settlements role as service centre and its potential as a service provider to its hinterland.

For this planning zone only the tertiary centres are of relevance. They are subdivided into four categories, based on its economic potential, population, level of infrastructure and the environmental conditions.

- a. **Tertiary Centre I (Regional Centre):** service centres for production zones. This centre would have a population of 5000-10000 people e.g. Shakawe or Sehitwa. Facilities would be CJSS, Clinics serving a catchment population within a radius of 30-50 km. or more, depending on the remoteness of the district, Headman, A/D, ACDO etc.
- b. **Tertiary Centre II (Local centre):** service centre for a catchment area of 15 km. radius with a population of 1000-5000 people.
- c. **Tertiary Centre III (Sub-Local Centre):** lands or cattlepost service centre for a catchment area of 15 km. radius with population of 500-1000. The majority of settlements in this category may be grouped together to form viable economic units.
- d. **Tertiary IV:** This settlement type is restricted only to remote areas. The settlement type will cover a population cluster or catchment of 250 or more people. The economy of these areas are mainly hunting and gathering and to some extent agricultural production.

1.2 Development Strategy

Based on the policies as mentioned in par. 1.1 we come to a development strategy, which aims at:

- a. Sustainable use of natural resources;
- b. Diversification of the resource base;
- c. Improvement of food security at household level, especially for the most marginalized households;
- d. Employment and income generation within Zone 6;
- e. Improved accessability of basic social services;

These aims should be achieved through (not in order of importance):

1. Preservation of natural resources to halt further land degradation;
2. Identification of resources presently under utilized and, where possible, to draw up utilization plans for these resources;
3. Rural industries are developed to widen the resource base; these industries focus primarily on processing of locally available resources;
4. Multiple use of areas is promoted where- and whenever it is not causing conflicts; but
5. Where necessary, functions are separated through an appropriate zoning plan, developed in consultation with the population;
6. Where possible, and where it is not conflicting with other forms of land use and the wishes of the people, commercialization of the livestock sector is promoted. This could be attempted through improved management and fencing of land;
7. Improvement of access to land and land resources in general, but especially for the rural poor, the landless and the RADs;
8. Provision of basic educational and health services in combination with improved access to higher level services outside the area, through improved communication and physical infrastructure;
9. Improvement of local administration through human resources development.

CHAPTER 2: EXISTING DEVELOPMENT PROJECTS AND LAND USE PLANS

Introduction

Due to the isolation of the area and its low population densities, as well as the limited water resources, very few plans were developed in the past for WCRZ. However, it must be stressed that government puts a lot of effort to provide the communities with basic services.

2.1 Ongoing government assistance

In spite of the remoteness and inaccessibility of the area, the government and district council have provided some basic services and facilities, especially in the three recognized villages, but also in some other settlements. Facilities and services include water supplies, primary schools, adult education, health posts, mobile health services, tribal administration and extension activities. For details of facilities and services provided, see section 2.6 in Volume I, Baseline Survey (1992), and Smit and Kappe (1992).

2.2 Arable farming

The southern part of Zone 6 drew a lot of attention from anthropologists, due to a large research project which started at Dobe in 1963.

Anthropologists involved had a scientific interest, but outside their research they also attempted to improve the life of the people.

They assisted in the registering of land, and stimulating arable activities. Missionaries, also active in the Dobe area, promoted arable farming. A well was dug at Dobe, although this was from origin not a settlement.

2.3 National monuments

The National Museum started work in 1990 on the development of a management plan for Tsodilo and Qwihaba. A Reference group was established, to guide the work and to generate ideas. Discussions were held with the DLUPU Working Group WCRZ as well as with local residents. It is expected that the management plan will be finalized in 1994.

2.4 Improved communal livestock management

The Nokaneng Flats Study (SMEC, 1990) contained proposals to develop a Communal Areas Livestock Management Scheme in the area west of Gomare-Nokaneng (based on proposals of H. Bendsen and H. Gelmroth 1983). A rotational grazing scheme would be used, to alleviate pressure from Nokaneng Flats, and provide grazing in the western sandveld, i.e. in the eastern part of Zone 6. Water should be provided by reticulation of water from the floodplain of the Okavango Delta.

The report was presented but the government has not decided on its recommendations as yet.

The feasibility of this option has to be studied in further detail. Some details, especially regarding management, need further elaboration to make it a viable proposition.

2.5 Change of land tenure (Commercial Ranching)

An investigation was made into the possibility of changing land tenure from communal land into commercial land (ranches), southwest of Lake Ngami.

This request dated as far back as 1984. At that time the Hon. Minister of MLGLH decided negatively on this request, based on the following arguments:

- grazing condition is poor
- cattle population being too high at each borehole
- some of the boreholes are too close to each other
- due to this, bigger ranches are needed so even boreholes 8 km. apart would not qualify

The request was renewed 1991, claiming that the grazing had improved much since the previous investigation.

However, the request was rejected, since the grazing is still poor in parts of the area. Besides that, the area is congested with a large number of people (RADs) living at the cattleposts who would be displaced.

2.6 Socio-economic survey south-west Lake Ngami (Kareng)

A socio-economic survey was carried out by A.Campbell and M. Main, on behalf of RADP (Campbell & Main, 1991).

This study confirms the general picture of the position of labourers, RADs, in cattlepost areas. A high degree of uncertainty about work, resulting in people moving very often from cattlepost to cattlepost. Very low payments (if any at all). No formal jobs are held by RADs. Few children manage to attend school. A degrading resource base is apparent, land is used more and more for grazing, traditional gathering areas are lost."

"They recognise their traditional lifestyle is no longer possible, that wildlife cannot be freely hunted and that wild food becomes less easily obtainable every year. They accept that

wildlife must become their subsistence base, and appear prepared to do their best to make it work."

"They don't want to be lumped together without recognition of existing cultural and social ties."

"They would like the opportunity to earn money, preferably in the area where they live; they don't want to have to work for water, milk or handouts."

This is very much the same as the wishes expressed by the councillor for this area, Mr. Segadimo. People from Kareng want the RADs there to be allocated land in the west, the area of Botshelong (C.f. Development Plan Groot Laagte, par. 6.10).

2.7 (re-)Settlement of people Hainaveld Ranches

Other areas in the district are congested with people. Some people are to be resettled due to dezoning of land, i.e. the commercial TGLP ranches at Hainaveld.

A tentative estimate of the number of people the Communal Service Centre should cater for, is 1300 up to 2000 people. (Saugestad, RADP)

The area earmarked for resettlement, the communal service centre (ranch OM 73 and OM 74), measures some 17,600 ha. The area has a very low carrying capacity and is void of natural resources. For that reason it does not seem to be suitable for this purpose, at least not for this large number of people.

Presently preparations are made for a socio-economic survey in the Hainaveld area. One of the aspects to be included in the survey is, whether some people would prefer another area to settle.

Council/DLUPU are urgently requested to consider whether there is sufficient land set aside for the displaced population (Saugestad, RADP).

2.8 Resettlement of people from Kuke Gate

Many people are presently squatting at the Kuke Gate, near the Veterinary Camp. A social survey was done by the Ghanzi DLUPU among the people here, which showed that some people in fact have more ties with Ngamiland district than with Ghanzi.

A request was received in 1990 from the District Commissioners Office in Ghanzi, to assess the possibility of whether some people from Kuke could be settled in the Groot Laagte (Ngamiland) area.

Some of the people have been allocated water rights along Kuke fence and the area of Botshelong, but they have no resources to develop their water point.

Few have cattle, others might have access to cattle under the EPF scheme but have no water point. Usually these are not individuals

but small groups or bands of people.

The southern part of WCRZ might offer space to settle, as well as other resources: wildlife, veld products, grazing land. If people want to move to WCRZ this could decrease the pressure on the other areas and enhance sustainable use of the ranch.

2.9 District Development Plan IV

The reader is referred to Volume I, Chapter 2, where the projects which were contained in DDP IV have been described.

CHAPTER 3: LAND EVALUATION

Introduction

"Land Evaluation can be defined as the process of estimating the potential of land for one or more alternative uses" (Young, 1976 quoted in UNESCO 1986).

The FAO methodology as explained in 'the Framework for Land Evaluation (FAO, 1976) is used. The following stepwise approach is adhered to:

1. Definition of the relevant Land Utilisation Types (LUT) in the area;
2. Determination of those land qualities that have a direct influence on the production of the LUT;
3. Rating of these land qualities by means of a single (or a set of) land characteristic(s)
4. Matching the land use requirements and the land qualities to arrive at the land suitability for each tract of a land for present conditions (current land suitability classification).

The FAO system for land evaluation (FAO, 1976) gives land a much wider definition than soil only, it includes the vegetation on the soil, the air above the soil (climate), relief, hydrology and fauna (natural, domestic). All these characteristics should be taken into account in the land evaluation exercises, insofar as they are relevant to the land use under consideration.

For details on land evaluation procedures the reader is referred to literature published on this topic; e.g. UNESCO (1986); FAO (1976, 1983); Elsevier (1981); Rodgers (1991).

3.1 Definition of land units

The evaluation for arable farming was done on the basis of soil units, taking into account the agro-climatic zone for each unit. However, for the purpose of extensive grazing or wildlife utilization one can not assess the suitability of the area on the basis of soil characteristics alone. Other factors need to be taken into account, e.g. water potential and vegetation type.

The vegetation type is considered to be defined mainly by the physiographic unit (geomorphology) and rainfall pattern. The water potential is deduced from the hydro-geological map and the location of water points (wells and boreholes) in Zone 6. When an overlay is made from all these data, one can define certain land units, which are represented in the following matrix:

Map Unit	Physiographic Unit	Water Potential	Rainfall
HmH HmL HpH	<u>H</u> ardveld	<u>m</u> edium p <u>o</u> or	<u>H</u> igh (>450 mm) <u>L</u> ow (<400 mm)
SmH SmA SpH SpA SpL	<u>S</u> andveld	<u>m</u> edium p <u>o</u> or	<u>H</u> igh (>450 mm) <u>A</u> verage <u>L</u> ow (<400 mm)
ApA ApL	<u>A</u> lluvium	p <u>o</u> or	<u>A</u> verage <u>L</u> ow (<400 mm)

The different map units are found in map 2.

3.2 Land Utilization Types (LUTs)

The following Land Utilisation Types are relevant for Zone 6 (based on UNESCO, 1986, Rodgers, 1991; for definitions, see below):

Land Use		Land Utilisation Type
Arable farming		Traditional Farming
		Improved dryland farming
		Irrigation
Extensive Grazing	Rangeland Utilization	Pastoralism
		Ranching
Forestry		Commercial Forestry
		Community forestry, with use of veldproducts
Wildlife Utilisation	Non-consumptive	Preservation/maintenance biodiversity, with game viewing/education/research
		Wildlife viewing
	Consumptive subsistence/recreational	Citizen/resident hunting
		Community subsistence hunting
		Tourist/Safari Hunting

In Volume I, (land suitability, par. 1.3.2) the results of the evaluation for improved traditional dryland farming are given.

ation describe land performance under average conditions, and do not take into account the interannual variations in rainfall which are frequently the major determinant of yield in semi-arid environments such as Botswana." (Radcliffe, De Wit & Schalk, 1991)

Traditional rainfed arable farming is most important for the subsistence of residents of Zone 6, however its potential is limited since the soils are poor and water holding capacity is low, which gives severe yield reductions in years with below average rainfall.

Forestry can not be considered at this present stage, since data are lacking. In 1994 a start will be made with a CEC funded 'Forestry Programme for Botswana'. This programme will focus in particular on the conservation and improved management of woodland resources. In this survey attention will be paid to both kinds of land utilization types: commercial forestry and community forestry (with use of veldproducts).

Other forms of land use which should be evaluated on its potential are pastoral farming and wildlife utilization.

The following definitions of land use types are used:

- **Pastoralism:** semi-nomadic, small scale, extensive grazing and browsing. The products are milk, hides, skins and some meat for local consumption. Some meat is marketed, to the abattoir or local butcher; hides and skins are sometimes marketed, at very low prices. The cattle provide drought power for other farm activities. The capital investment per ha. is extremely low. Labour input per ha. is also very low. Technology is traditional. The land is tribally owned and the family income is low to moderate. Veterinary input is low.
- **Ranching** (presently this form of land use does not exist in Zone 6): medium scale livestock rearing, rotational grazing and browsing. The products are meat and hides. The meat is sold to the abattoir. The capital investment per ha. is intermediate to high, esp. regarding construction of fences. Improved management includes additional feeding and provision of minerals. Labour input per ha. is intermediate. Improved technology applied mainly to water: mechanized pumping and reticulation of water. The land is leased and the family income is moderate. Regular visits by the veterinary department.
- **Conservation:** conservation of the biosphere; a multiple land use type; sustainable utilization of the vegetation by gathering of veldproducts by residents. Tourism in low densities only. Low investments in infrastructure like water and accommodation, merely protection of the sites. No hunting or grazing permitted, nor gathering of firewood. Archeological sites or national monuments are protected. Education and research is the aim, where possible also gaining some income for local communities.

- **Consumptive use of wildlife:** Resident/Citizen hunters as well as subsistence hunting in the area. No facilities, no investments made. Low offtake of wildlife, due to low densities of game. No improvements in infrastructure. Also use of veldproducts and veldfoods, for crafts and food supply.

- **Consumptive use of wildlife:** Community having access to the hunting quota; some licences sold to residents and citizens, some to the safari industry, the remainder used for subsistence. Low to moderate offtake of wildlife, due to low actual densities of game. Photographic tourism/ Game viewing in the conserved areas, as well as eco-tourism. Intermediate level of investments for infrastructure; support needed from outside. Also use of veldproducts and veldfoods, for crafts and food supply.

No land evaluation can be carried out for wildlife utilization at the present moment, due to time constraints and the experimental character of this type of evaluations.

3.3 Current and potential suitability for pastoralism and ranching

In order to determine the current and potential suitability for pastoralism and ranching, an exercise on rating of land qualities that influence land use has been undertaken.

The influence of each land quality on land use is determined by a single or set of land characteristic(s): forage availability, water availability, biological hazards, accessibility and location.

The technical aspects of this exercise are described in Appendix 2. In this paragraph we only want to discuss the outcome of the exercise.

3.3.1 Current and potential suitability for pastoralism

In Zone 6 most of the areas are classified as permanently unsuitable for pastoralism (see map 2 and table 1). Main factors causing this unsuitability are water availability, water quality and predation. When predation is the only constraining factor the involved area is called temporarily unsuitable. These are the areas around Qooshe, Qangwa, Dobe, Xaudum, Xabacha, NxauNxau. The best areas for pastoralism in Zone 6 are still classified as very marginally suitable. These are the areas around Gani and in the conservation areas Tsodilo Hills and Aha Hills.

When looking at the potential for pastoralism determining factors are the potential carrying capacity, the water potential and mogau.

It is expected that the carrying capacity will increase after

grazing areas have had the opportunity to recover from overgrazing and mismanagement. For Zone 6 the average potential carrying capacity is expected to be 14 ha/LSU. For some areas it is very difficult to assess the water potential. The chances of finding suitable water are very low and the costs in establishing a water point are very high (due to transport distances and hitting blanks). Averagely one can say that the water potential is 'variable poor to fair' and 'uniform poor' (Hydro Geological Map, GSD 1981). Mogau is a limiting factor for pastoralism. Whenever grazing pressure increases, Mogau is likely to increase rapidly, even in areas where presently Mogau is absent.

3.3.2 Current and potential suitability for ranching

Currently no ranching takes place in Zone 6. Potentially the same as mentioned on the suitability of pastoralism accounts for the suitability for ranching. Additional influencing factors however, are the presence of elephants, the population density and conflicts with other land uses.

In most of the areas that are suitable for fencing elephants are likely to damage the fences during the dry season (migratory route from the west to the Okavango). Other areas are to dense populated: not enough space is available to start a ranch (especially under the existing dual right system). A last factor is that due to a more intensive grazing pattern, Mogau is likely to increase, and in areas important for gathering of veldfoods, cattle will compete with human beings on this kind of food and depletion will be the result.

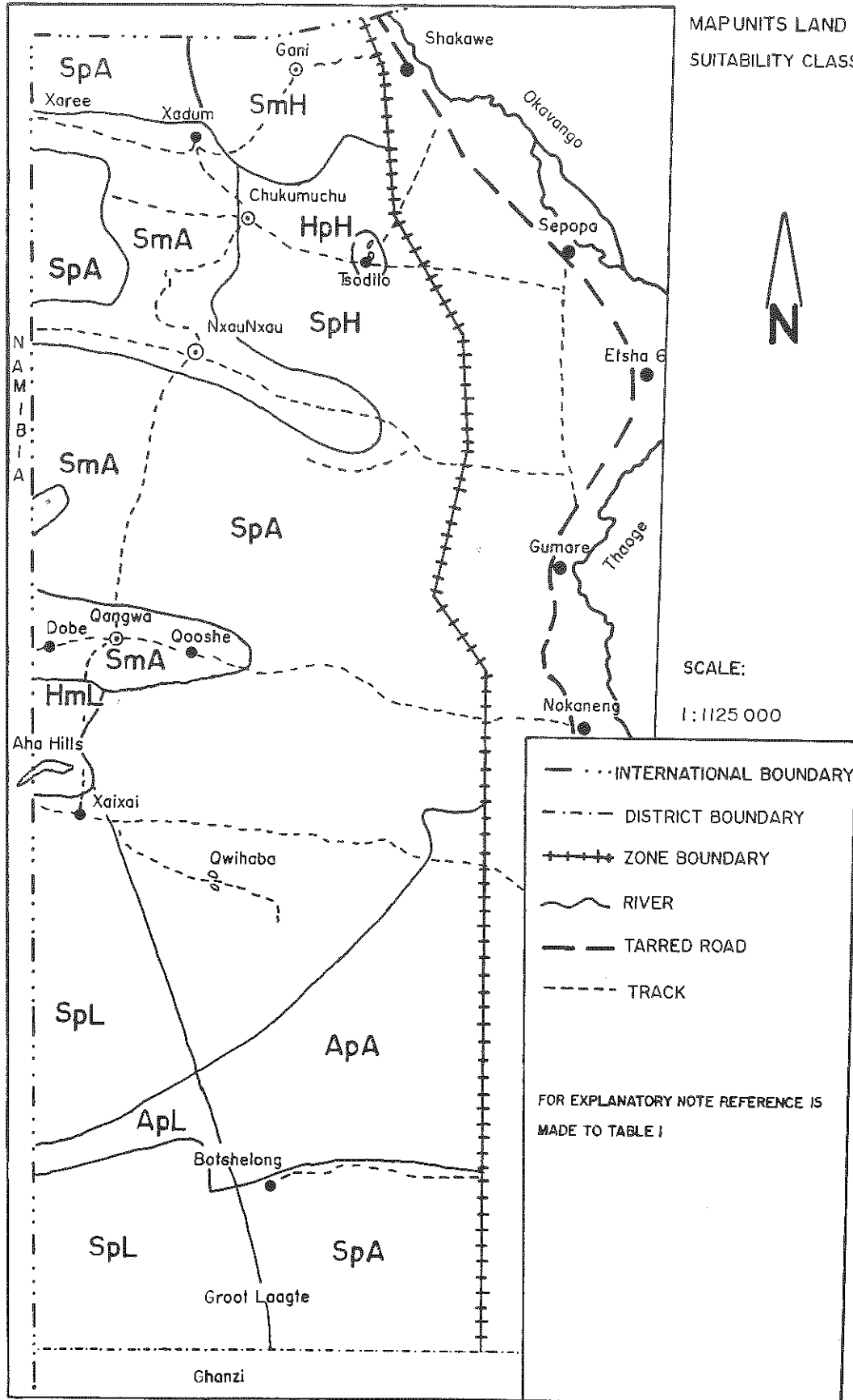
Table 1: Potential suitability for ranching and current and potential suitability for pastoralism.

	HpH	HmL	SmH	SmA	SpH	SpA	SpL	ApA	ApL
Current suitability for pastoralism	S4	S4	S4	N1	N2	N2	N2	N2	N2
Potential suitability for pastoralism	S4	S4	S4	N1	N2	N2	N2	N2	N2
Potential suitability for ranching	S4	N2	S4	N1	N2	N2	N2	N2	N2

Note: currently no ranching takes place in Zone 6.

- S4 = Very marginally suitable
- N1 = Temporarily unsuitable
- N2 = Permanently unsuitable

MAP 2:
 MAPUNITS LAND
 SUITABILITY CLASSIFICATION



Drawn by the Department of Town & Regional Planning

CHAPTER 4: LAND USE ZONING, LAND ALLOCATION AND SECTORAL DEVELOPMENT PLANS

Introduction

This chapter contains general guidelines for Land Board regarding land allocations and land use zoning. Thence it is followed by sectoral development plans; plans which are usually narrowly linked with the land use (zoning) and land allocation. Detailed zoning plans are worked out per village area, and is elaborated on in chapter 6. Two land use maps are attached to this plan on a scale 1: 250,000. It is recommended that every person who applies for land or for a water point consults these maps at the Tawana Land Board or the relevant Sub Land Boards. Present land tenure does not change in this plan. Only the southern part of the Zone 6 (NG 4 and NG 5) have become Wildlife Management Areas. This in line with the wishes of the residents in these areas who want to start a Community Based Wildlife Utilization Project. According to the land evaluation this area is unsuitable for grazing and was under TGLP designated 'Reserved area'.

4.1 Land Allocation

All land allocation should be done in line with the zoning plans and zoning guidelines as spelled out below. These guidelines are in line with the new agricultural policy (Government Paper no. 1 of 1991). Please be referred to the enclosed Land Use Maps.

4.1.1 Old water points

In line with the Tribal Land Act¹, all undeveloped water points, which were allocated more than five years ago will be withdrawn (this was also recommended in the past by the consultant working for Land Board Mrs. H. Bendsen, 1989).

Since grazing areas are limited, it is felt that the rights of those people that were not able to develop their water point should be withdrawn. This to give other people the opportunity to develop a water point.

People could still re-apply when their allocation has lapsed. Allocation of the water points should be in line with the proposed land use (i.e. if someone was allocated a right to drill a borehole 12 years ago in an area which is now zoned for ploughing, the right is withdrawn and nobody can be permitted to drill, unless it is for domestic purposes or draught power).

¹The Tribal Land Act from 1968 has been reviewed; the new Act can be expected any moment; one of the proposed changes is that rights are relinquished after 3 years. Once the new Act is gazetted, this time limit should be used as the guideline for Zone 6.

4.1.2 Water points allocations

New water points can only be allocated in those areas where it is in alignment with the land use zoning. The normal Land Board guideline should be adhered to that no water point should be allocated within 8 km. from natural water points like pans and rivers or from water points like boreholes and wells.

4.1.3 Veterinary Fences

In addition, no water points can be allocated within 8 km. from Veterinary fences according to Land Board Guidelines. A policy from the Ministry of Agriculture is that kraals should be at least 4 km. from Veterinary Fences and villages 8 km. from Veterinary fences.

4.1.4 Freeze on timber concessions

On request of the Ngamiland DLUPU and the Ministry of Agriculture the Tawana Land Board implemented a freeze on allocation of timber concessions in Ngamiland District (dated the 6th of October 1992).

Once the forestry inventory has been finalized and a management plan has been prepared and approved, it can be considered to lift the freeze.

4.2 Land Use Zoning

Land is zoned according to the various land uses in different categories:

- a. Mixed farming
- b. Arable farming and gathering zone
- c. Grazing areas, with subzones:
 - livestock development zone
 - livestock development zone, fencing allowed
 - grazing area, no new livestock watering points allocated
 - cattle trek route, no new watering points allocated
- d. Conservation zone
- e. Wildlife Management Area
- f. Residential area

This paragraph discusses the characteristics, regulations and legislation per land use zone.

It must be mentioned that land use plans are only formulated through the residents and only on their wish. In some areas people expressed the wish of not having a land use plan. It must be mentioned here that whenever residents want to have a land use

plan, they can still request the DLUPU to assist them in formulating the plan.

a. Mixed farming zone

Mixed farming areas do not have a specified use. All land uses can occur in the same area. In principle areas were designated mixed farming when residents in the specific area expressed the wish of not wanting a land use plan.

b. Arable farming and gathering zone

Main function: arable farming and gathering.

Gathering does not necessarily conflict in any way with the main activity of ploughing, since veldproducts are more abundant in the areas with poorer soils. This zoning is proposed with the aim of conservation of veld foods, in line with the wishes of the people, in line with the RADs policy (see Vol I). In the land use plans usually a distinction is made between the two types of land use, indicating which areas are of specific importance.

Grazing is regarded as a conflicting use, therefore no cattle-posts or livestock watering points can be allocated in this zone or within a radius of 8 km. from the ploughing area.

Existing water points will be tolerated (permitted) but no upgrading of the water points or redrilling will be allowed. Where the community would like to relocate some of the water points from the ploughing area elsewhere, all possible assistance should be given, e.g. through the Water Development Scheme.

Watering points can only be allocated for domestic purposes and for watering of draught animals (horses, oxen and donkeys). This entails a limitation of the number of livestock watered at one water point to a maximum of two span (20 head) of oxen. Any excess of cattle should be grazed in the grazing area.

Gathering is not considered to be a conflicting land use in a grazing area, nor any harvesting of timber or other veldproducts.

c. Grazing areas

-Livestock development:

Livestock development areas have as prime function grazing of domestic and game animals. No arable fields or residential plots can be allocated in these areas, since these are regarded conflicting with the grazing function.

Gathering, hunting and other forms of land use are permitted in the grazing areas since these do not form conflicting forms of land use.

-Livestock development area, fencing allowed:

The areas where fencing is allowed are in fact a sub-zone of livestock development areas; the same limitations count for the areas where fencing can be allowed.

In line with procedures of the Ngamiland DLUPU (accepted in its meeting on 26/11/1992), the prospective applicant should be allocated a water point, and first acquire a water right in the area earmarked for fencing. Once the water point is developed he/she has to apply at Land Board before permission can be granted to fence land. Land Board will require an investigation from DLUPU prior to allocation.

The areas for fencing are not to be advertised, it is up to any interested applicant to establish a water point and to meet the other requirements.

-Grazing area, no new water points allocated:

In this zone no new water points can be allocated. Some local communities wanted to have this kind of zone when boreholes were already to close allocated and overgrazing was severe.

-Cattle trekroute, no new water points allocated:

The cattle trek route is primarily a corridor for cattle, on their way to the abattoir in Maun. It has been a policy of Land Board that no water points are allocated within the trek route corridor; the corridor is 4 km. on either side of the centre line, in total 8 km. wide.

No residential areas, nor arable fields should be allocated within the trek route corridor. No fencing is allowed.

d. Forestry

At the present stage no further zoning can be done for forestry. The district is awaiting further investigations into the forest resources. Based on the inventory results, guidelines can be prepared for exploiting timber in the northern part of Zone 6.

Forestry extraction seems compatible with other forms of land use, such as grazing or ploughing; light grazing protects the timber for fierce veldfires (Burger, 1992). The processes that are vital in the regeneration of trees like mukwa are not sufficiently studied. It is recommended to take this aspect in to consideration in future research.

Forestry activities might have an effect on gathering areas, since changes in canopy cover and extraction activities itself can alter the vegetation type.

Extraction of timber is not to be allowed in the conservation areas (see below).

In the new forestry legislation which is due 1994 (M. Tumaletse, pers. comm.) some allowance will probably be made for protection of areas which are important because of genetic resources and special vegetation type. This would mean that in due time the areas presently zoned as conservation area because of their important vegetation type, could be brought under the protection

of the New Forestry Act.

e. Conservation areas

Conservation of certain areas is suggested for the following areas of importance:

- national monuments,
- areas where rare or endangered vegetation types are found,
- areas where rare or protected animals are present,
- archaeological remains are (or might be) found,
- areas that are ecologically sensitive.

Conservation areas can overlap with other land use zones.

No hunting (subsistence, citizen, nor commercial) is permitted in conservation areas. Gathering of veldproducts is considered to be sustainable and therefore it is permitted, but not for commercial purposes.

Collecting firewood is only permitted in those areas allocated for that purpose. This should be decided upon in discussion with the people, the land authorities and other relevant bodies (e.g. national museum or forestry department).

Ploughing can continue where it is presently done. For new ploughing areas advice need to be requested from the Ngamiland DLUPU and the NMMAG.

No off the road driving is permitted in Conservation Areas. Roads development (including labour based drought relief roads construction) is only permitted when much attention is paid to the alignment and with permission from the land authorities. The land authorities should ask in such case technical advice from Ngamiland DLUPU and the National Museum.

f. Wildlife Management Area

In WMAs, wildlife utilisation is the prime land use, other land uses are permitted only if they are compatible with it. Wildlife utilization entails photographic (non-consumptive) use, hunting, game ranching, live capture or game cropping purposes.

The Wildlife Conservation Policy states that guidelines should be developed for all WMAs, based on the local conditions. The following guidelines count for the WMA in Zone 6:

No further allocations of water points for livestock, but cattleposts present or water points allocated within the past 5 years can be developed.

Watering points can be allocated and developed for mixed use; i.e. for people, draught animals, gardening purposes. Since water points will serve groups of people, it is allowed that a maximum number of 50 cattle per group is allowed to graze within the WMA; larger cattle numbers should be brought to the grazing areas.

Fields can be developed for arable farming; due to the nature of

the soil and the distribution of people this activity remains very marginal and is compatible with wildlife utilization. The Wildlife Management Areas are ecologically very fragile, with a high risk of resource depletion and land degradation. Population densities are therefore to remain low. Settlements do not exist at present; settlements, if any, can be developed at most up to the category of Tertiary IV (see par. 1.1.7), with limited services.

Use of existing (saline) boreholes for wildlife is a possibility and should be considered.

g. Residential Areas

No accurate descriptions are given of residential areas. Settlements are to be kept compact, to avoid in due time high expenses to service the settlements with facilities.

4.3 Arable farming

4.3.1 Agricultural Extension Area boundaries

Considering the knowledge of agricultural assistance programmes (table 45, Vol.1) it must be concluded that there is obviously scope for improvements here. An important factor in extension is the scattered residential areas, which hampers the extension seriously. Without mobile extension workers or resident extension workers in the area it is difficult to reach those farmers.

The transport situation is of special concern in this remote area. In general, extension workers are supposed to arrange transport themselves; however, the motor cycles in use in other parts of the country are of little use in these sandy areas. Maintenance and service is very difficult, let alone the purchase of fuel.

A cheap alternative could be horses, which are used by few of the extension workers. However, in general the extension workers show little interest in this type of transport.

The aim of agricultural extension is to reach the farmers that are most interested in arable farming and have most potential to improve their farming system. Secondly, those farmers that are most in need for assistance, the most marginalised farmers with an interest to broaden their subsistence base, in line with the aim of the agricultural policy, to provide food security at household level.

It is proposed to post:

- 1 Technical Assistant in Gani.
- 2 Field Assistants in Chukumuchu and Qangwa.

Rainfed crop production is most important in the north of zone 6, it is the main activity in the farming system of the Bahambukushu. This area also has the best potential and agro-climate. Based on this, the number of farmers and hectareage ploughed (Vol. I, table 51) and the settlement hierarchy as mentioned in chapter 5, it is recommended that a Technical Assistant is based at Gani. The TA should cover the ploughing areas around Gani, Xaudum, Tsodilo, (approximately 600 ha., at least 200 farming households or 1128 residents- 1991 Census). In addition, he will supervise the Field Assistant of Chukumuchu.

A field assistant should be based at Chukumuchu, another subzone centre and centre for development under the RADs programme. Here the population (and ploughed area) is increasing rapidly. The main reason for settling here is the presence of ploughing areas, which shows the relevance of an extension worker based here. Some 500 people, or 77 households stay in Chukumuchu valley (1991 Population Census)

NxauNxau could still be covered by the TA from Etsha, since the road is reasonably passable for most of the year and ploughing plays a minor role in this area. Alternatively, NxauNxau could be covered by the TA from Chukumuchu. NxauNxau has some 376 residents (1991 Census).

The FA from Qangwa could continue his activities, no adjustment is needed of the boundaries. This subzone has 1224 residents. Presently ploughing here is a marginal activity, but a lot of interest is shown in Qooshe, Dobe and XaiXai. In due time upgrading of the post of FA could be considered.

Presently the boundaries of extension areas do not follow natural boundaries and show some overlap. The new boundary improves this situation.

Considering the fact that quite a few people do not master Setswana, it might be advantageous if the extension worker in Gani and Chukumuchu would master Simbukushu, since Bahambukushu are most dependant on ploughing.

4.3.2 Administration

It is proposed that agricultural extension workers cooperate with the Assistant Project Officers (APOs) in the villages Gani, Chukumuchu and Qangwa. Their cooperation is important since transport is a main constraint in these remote areas. Furthermore it will improve the outreach of the Ministry of Agriculture, and the APOs are able to identify many of the farmers that are most difficult to reach through normal extension channels.

It has been agreed by the Regional Agricultural Office and RADO Okavango that the APOs can assist farmers to fill in application forms for ALDEP or other assistance schemes. The Crop Production Officers have been requested to train the

APOs in these tasks.

4.3.3 ALDEP

ALDEP is a most important programme for Zone 6; many people are eligible for assistance under Aldep, since they usually own very few cattle, if any at all; still only 28 % made use of ALDEP (see p. 62, Vol.I). Some of the constraints with ALDEP will be overcome in due time. More and more people will acquire an O mang and more people have their lands registered. Some achievements have already been made in this respect: the people from Chukumu-chu were assisted with their land application and their ALDEP application at the same time, the land applications were then passed to the RADO. It is recommended that this approach is followed in future, officers visiting the area should be able to help the farmers with all requirements. Similarly, APOs should have all application forms in stock, to help the farmers.

O Mang registration obviously has some shortcomings in the remote areas. A quarter of the population does not attend Kgotla meetings, which means that most of those people will not acquire an O Mang easily.

It is recommended that the RADO will assist the people with registration for O Mang. This will also allow these people to benefit from the new ARAP programme and ALDEP phase II.

Only 51 % of the people own their draught power (p.61, Vol.I). It is recommended that either RADO or DAO can assist people more actively in acquiring draught power, even if this would involve that the animals have to be brought from other areas to the remote zone.

In some areas it is impossible to find people willing to sell their oxen or donkeys to other farmers, particularly RADs. One of the reasons is that Government payments take too long. As alternative, cattle can be bought from the Matimela office with ALDEP assistance, through the RADO.

Draught power should still be provided to RADs under the EPF package; however, more attention should be paid to the management aspects. See also par. 4.4.5

4.3.4 Crop Damage

Crop damage can be prevented through proper zoning of land and with physical means like fences.

The zoning of land is the most important approach followed to address this problem.

Despite the long history of group fences in Ngamiland, it is felt that this is getting more and more complicated through the individualization of communities, i.e. social structures break down and people are less and less cooperative. This finally might

result in fences not being maintained, which results once more in destruction of crops.

Secondly, fences might often be destroyed in areas where elephants are regularly passing; obviously this is a major constraint in the protection of crops. At the moment of writing this report MoA was undertaking a survey on the implementation of electric fencing. A request to subsidize this kind of fencing through ALDEP phase II was made. In the meantime MoA should liaise with DWNP for compensation for the farmers.

Thirdly, funding of group fences is constrained, since AE-10 applications could not be processed for the past two years. In late 1993, beginning 1994 funds were made available again. However, continuation of this scheme is still insecure.

Zoning of land will take the pressure from cattle away from the crops. Once funds have been made available for the AE-10 programme again, electrified fences are recommended for those ploughing areas where elephants are a real menace.

Fencing of land through the ALDEP programme is recommended to continue, since it will help farmers to overcome certain constraints regarding group dynamics and cooperation of people.

4.3.5 Seed distribution

The most important constraint in arable farming here is the lack of seed. In drought years free seed are distributed and for this purpose additional field assistants have been appointed.

Still, the present system of distribution shows some shortcomings. Especially because the extension worker visits the area only for a day or few days, so (s)he will at times not be able to contact all farmers. It is therefore proposed to improve the coverage of the area by involving the APOs from Council in some of the settlements (Chukumuchu and Gani).

Alternatively, farmers committees can facilitate the proper distribution of seed and might be beneficial for the farming community.

With the proposals in this plan for posting of extension workers in settlements in Zone 6 seed distribution is likely to be improved.

4.3.6 Agricultural Research

More research is needed into the arable production potential of the western communal remote zone. A new crop yield simulation model (CYSLAMB, c.f. Radcliffe et al, 1992) indicates a relatively good potential for rainfed arable agriculture. However, the older land evaluation system (FAO, 1976; see for example Jamagne, 1990) shows considerable discrepancies in the outcome with the new model, and seems to confirm more present land use.

More research sites should be established in the remote zone as a matter of urgency. Here the interactions of different parameters like soil, climate and farming system can be studied into more detail.

On farm trials seem to be the best option, and would allow for extension of new and better farming methods. It is recommended that also some farmers will be selected from Zone 6 for on-farm trials.

In Diniva, Gani area, a large number of arable farmers are found, who have shown interest in on-farm research trials. Their fields are protected and a large number of farmers plough inside the drift fence.

4.3.7 Management practices

Below several suggestions are given for improved crop husbandry. None of these suggestions are new, and few have proved to be successful in the past (i.e. well adopted).

Shortage of labour is hampering in principle the adoption of improved techniques; it shows that this problem should be tackled in an integrated approach to improve the farming system.

Through extension, farmers should be made more aware of good farming methods.

Timely ploughing is difficult when (male) relatives are employed in the towns or villages elsewhere. Normally they come home at Christmas for ploughing.

Still two-third of the farmers are broadcasting seeds. A better germination and a better spacing of crops can be achieved by row planting. This however can be contra productive in years with a very irregular rainfall, since it might make the stand of a crop too uniform and therefore vulnerable.

Weeds are a major competitor with the crop for soil moisture. Weeding, 4 to 6 weeks after planting, should be promoted more, to decrease competition. Yields can increase on average by 30 % by well timed weeding.

Weeding is not practised much, often because it demands too much labour. With rowplanting mechanization of weeding is facilitated, people can use a cultivator which will decrease the demand for labour.

Experiments were done to assist women that might not have access to draught power with harrows and other implements, this might be applicable here as well.

Ploughing with a double furrow plough also decreases the labour demand, since only one person is needed, to guide the draught animals. It might demand more animals though, depending on the soil 4 to 6 animals are needed.

By ploughing of crop residues after harvest the fertility and water holding capacity of the soil is increased, which has a beneficial effect on the crops in following years. Also this

could be stimulated through targeted extension. Bird scaring is of special importance when growing sorghum and millet. At the same time it is labour demanding, especially since children, which were traditionally assigned this task, are going to school.

The problem of bird damage could be alleviated by a good selection of crop variety, some varieties are less prone to bird damage.

Fertilizer, manure and compost do have a positive effect on the crop yields; a major constraint in application of fertilizer is the labour, as was shown by H. Bendsen (undated report).

Synthetic fertilizers have a major limitation in that extension workers are not experienced in this respect, and have at times problems in advising the farmers on how to apply it correctly (pers. comm. research Team CSDA). Further training is needed.

Another aspect that needs to be paid attention to is the post-harvest methods in the planning zone. If possible extension should focus on the improvement of drying and storage of the crops.

4.3.8 Crop varieties

Maize is cultivated most by the households (92 %), Sorghum and millet rank second and fourth (78 % and 57 % resp.).

This despite the fact that the latter are much more drought resistant than maize.

Extension efforts should concentrate on the crop selection. In addition, more drought resistant varieties should be selected. As mentioned above, attention should be paid to the resistance to bird damage.

Crop rotation with cowpeas/groundnuts might increase yields, since these are leguminous crops which are able to fixate nitrogen in the soil, which will benefit other crops in successive years.

4.4 Livestock development

4.4.1 Extension Services

In comparison with arable farming the constraints in veterinary services seem to be less serious. Some of the larger cattle owners are in so far commercialized that they have a reasonable knowledge and management, and some have medicines available to treat their cattle against more common diseases.

Besides this, the Livestock Officers in the main villages do have their own transport and the SLO from Gomare visits the area

regularly. However, the budget for travelling expenses with own vehicles is usually limited and might be exhausted early in the season.

Extension is most needed in the livestock regions in Zone 6. It is proposed that a VA is posted in NxauNxau (covering Xaudum, Chukumuchu and NxauNxau) and Qangwa (Qooshe, Dobe and XaiXai).

4.4.2 Extension activities

Extension workers can advise farmers on better livestock management; they can diagnose livestock diseases and assist farmers with management practices like dehorning, castrating animals etcetera.

An important task would be to acquire more epidemiological data, occurrence of livestock diseases, extent of mineral deficiencies and its effect of livestock production, calving rates etcetera. This can greatly enhance livestock production, since these limiting factors have been studied insufficiently.

4.4.3 predators

Predators are a serious problem for farmers in Zone 6, especially the wild dogs. The Problem Animal Control Unit in DWNP has been informed about the issue. They have been requested to look into compensation aspects for livestock lost due to predators.

The DWNP is presently preparing some new compensation guidelines as amendment to the Act which was recently discussed in Parliament.

In several ways the proposed changes should facilitate easier compensation of the farmers, with less people involved, standardized tariffs etcetera. It is hoped that in few months time, after approval of the minister, the additions will be gazetted.

Presently the farmer has to kill the wild dogs to receive compensation, despite the endangered status of wild dogs.

It has been requested that compensation be paid to farmers without killing the predators. Furthermore, administrative procedures should be simplified to ease compensation, with fewer people involved, and payments to be made locally.

Mis-use should be prevented as much as possible.

4.4.4 Infrastructure development

Not all farmers have access to markets for their cattle. The DAHP tries to secure funding for extension of the cattle trek route towards Qangwa and XaiXai, which would involve the drilling of two additional boreholes. This is fully endorsed, the funding of the trek route should have priority, especially in these times of drought.

Facilities have been made to repatriate people to Namibia. The boreholes that are drilled will probably be given to the RADO to serve as demonstration farms.

It seems that the Government wants to develop further a buffer zone between zone 2 and 12 (EC and non-EC zone). It is felt that such a fence should not cross the southern part of Zone 6, due to the presence of wildlife here and the migration of wildlife in north-eastern direction. Such a fence would most probably leave all of the southern part void of wildlife. Secondly, cattle in the buffer zone would not be vaccinated against FMD, and would come closer to the Okavango Delta, increasing the risk of exposure to FMD.

The issue has been discussed with DAHP and Ghanzi district, and the best option seems to be to bring the buffer zone down to Kuke fence, from there the fence could be aligned south of the Groot Laagte WMA, along the ranches in Ghanzi which are fenced already.

4.4.5 Fencing of Communal land

The present semi-pastoral land use system seems to be fairly efficient. The variable climate, the veldfires and the scarce water resources have resulted in a flexible form of land use, in which rotational grazing is practised based on availability of water and grazing. Those areas which seem presently not to be used -due to absence of boreholes or wells- are often used as summer grazing area. Cattle is brought here after the rains and are watered at seasonal pans.

From the land evaluation it is clear that Zone 6 is very marginally suitable for pastoral farming. This is also shown by the vast open areas, where no cattleposts can be developed, mainly due to lack of water. The 'empty' areas have almost without exception a uniform poor water potential. A number of cattleposts have been deserted over the past years, due to predation and water shortages (see Vol. I). In many ways the constraints encountered here are similar to other areas investigated (see also Sluis et al, 1992a).

Calving rates are very low, and so are the off-take rates for cattle. This makes it doubtful whether fencing can be cost effective.

Still some proposals have been prepared for fencing in some parts of the area. Crucial factors are the social acceptability of fencing and, related to that, other land use.

During the consultations the residents in the predominant livestock areas objected often towards fencing of land. Especially the pastoralists with most cattle, OvaBanderu and OvaHerero, they have a mobile and opportunistic grazing system.

A main characteristic of the farming system is the mixed resource base. People are averagely involved in four activities to gain their subsistence income. Hunting and gathering are prominent

activities that require large tracts of land and this would be jeopardized by fencing. Fencing of land would worsen the resource base of the people, which would conflict with the aims of the policy.

For that reason areas selected where fencing is allowed are away from all areas inhabited by people. Areas with a high wildlife potential are excluded as well.

The area that is allowed for fencing is in the east of zone 6, south of Tsodilo Hills and 4 km. west of the cattle trek route, as well as north of the road to XaiXai.

It should be noted that the presence of feeder trek routes (along the road to NxauNxau as well as to Qooshe) do not permit fencing in this area.

In the land evaluation, chapter 6, the selected areas are described as land units SpH and SpA: Sandveld, with a uniform poor water potential and (relative) high to average rainfall. The potential suitability for pastoralism is permanent unsuitable, based on water development potential and predation by wildlife.

With some luck one might perhaps be able to establish a water point. Predation is most serious in the western part of SpA, near the border, not so much for the eastern part of Zone 6.

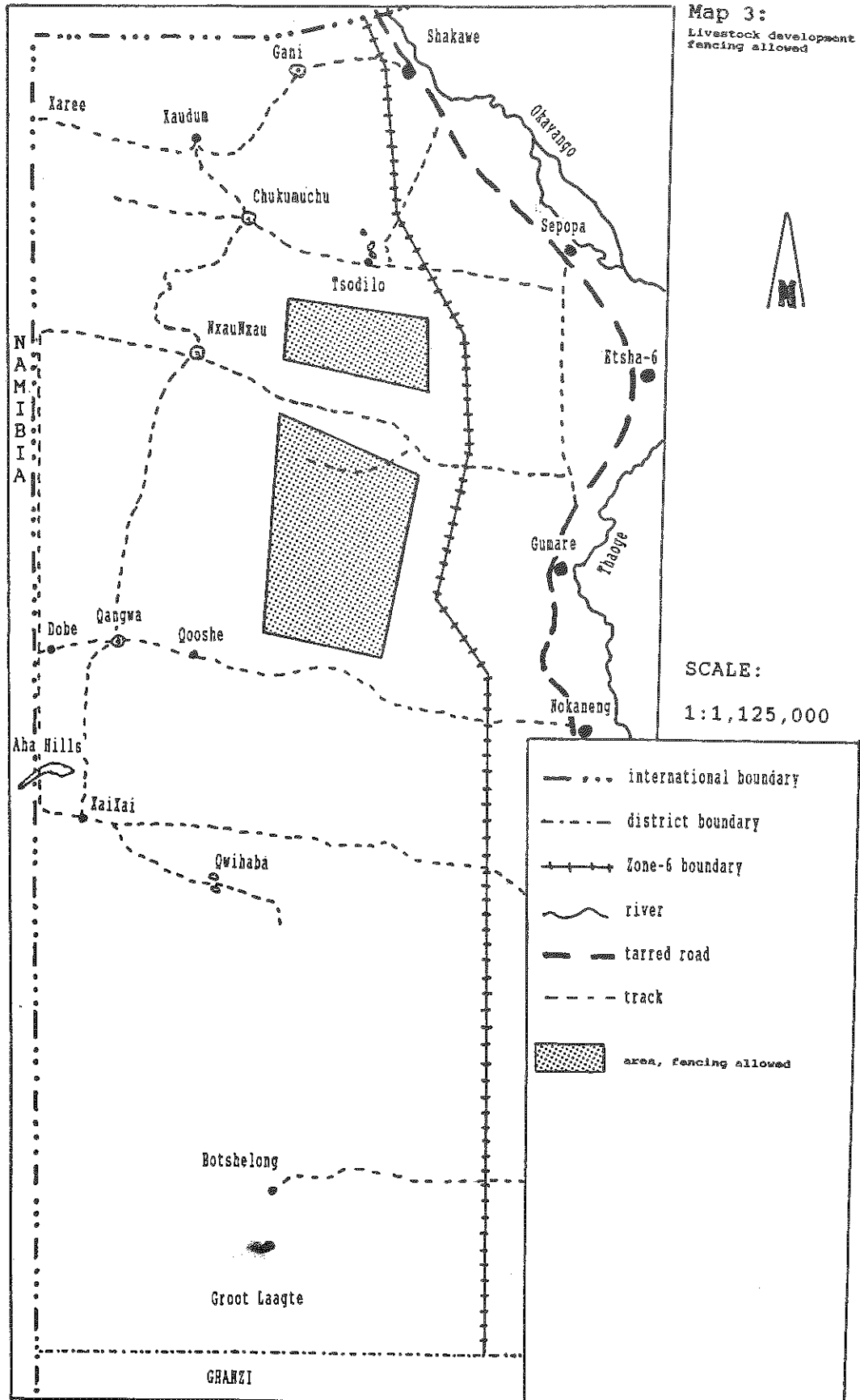
It is not possible to zone a large block for fencing due to wildlife migration. Annual migration seems to occur from Etsha area towards the Namibian border, but also from Groot Laagte towards the north-east.

The poor water conditions are similar for Toteng-Sehitwa Area, and for most of the district. It is proposed that, in line with the recommendations adopted by the DLUPU, no ranches will be demarcated, nor advertised. The area which is in principle zoned for fencing (see map 3) is reserved for this purpose.

Part of the area has been reserved in principle for community fencing. These proposals were prepared in the above mentioned study (Sluis, 1992a) for the Gomare Nokaneng area.

For allocation guidelines regarding fencing, see par. 4.1.2.

Map 3:
Livestock development area,
fencing allowed



4.4.6 EPF Livestock Scheme

There is high demand for cattle among the RADs. The scheme has a high popularity, and many people expressed that 'once we have cattle and once we have water for our cattle government will not have to bother about us any more. We will be independent.'

Considering the marginalized position of the households, the scheme seems an important tool to assist the people. However, there are some flaws in the scheme, or in the implementation of the scheme as it is presently done.

Water is a main constraint for all livestock development in this area, and similar for RADs that do not have any means to develop a water point.

If the people water their cattle at someone else his cattle post, they are often charged outrageous fees, excesses like being charged one beast a year by the borehole owner for watering 3 head of cattle do occur (Campbell and Main, 1991). This indicates the need for an integrated approach: water point and cattle should be provided.

To dig a well might not be the best solution. A well can be dug by the well digging unit from council, however, they do not have the capacity to assist many people; besides, they do not dig deeper than 20 m. because of the risks involved. In Zone 6 the water table might often be deeper than 20 m.

In cases where it is not possible to establish a well, boreholes could be an alternative. A borehole has the disadvantage that the people become dependant on fuel and the engine requires maintenance.

The means with which to pump water should be decided upon with technical advice from Dep. of Water Affairs or Botswana Technology Centre.

Up to now the RADO has worked rather independently in regard of establishment of water points. In future it is required that this will be done hand in hand with the DLUPU. A survey is needed of the land resources before a new water point is established.

Secondly, the EPF livestock scheme seems to end with the handing over of cattle to RADs. Little attention is payed to management aspects and knowledge of livestock management. Very recently a case occurred of all cattle dying at Xabacha (including some cattle of the Baherero, resident there) due to (still) unknown causes.

A better approach will be to provide good extension services to the new livestock owners, and regular check ups to ensure proper management of livestock.

Lastly, the provision of livestock can be disadvantageous for the resource base of the people and in the longer term they can become more marginalized. As mentioned, RADs tend to think that with livestock they will live a good life, but due to the above factors they can end up with nothing: depleted veld resources, poor management of cattle which might result in a dy-off of

cattle during the next drought².

For this reason it is once more of outmost important to have an integrated approach, involving DLUPU, Veterinary Department and RADO for their assessment and advises.

4.4.7 Agricultural Water Development Scheme

The water resources in Zone 6 are very poor, which is shown in chapter 1.5 (Vol.I) and in many other places in this Volume.

The water development scheme assists farmers in establishing water points in most of the country. Although very justifiable from an equity point of view, it could be considered that the risks involved are extremely high.

The required investments in the remote zone might be twice or triple times as much as elsewhere in the country, and there is no guarantee that water of good quality is found.

It might be considered therefore to limit the scheme to those areas with a good or reasonable water potential, and lower development costs, which would practically exclude most of Zone 6 from the Scheme.

Farmers will only be assisted when the water point is allocated in areas which are presently zoned as grazing areas.

²It is a fact that especially the small livestock owners with herds of less than 20 head of cattle are most vulnerable to drought. They do not have the resources and means to maintain their herd size in times of drought which results into a more and more skewed livestock distribution.

4.5 Wildlife utilization

4.5.1 Zoning Controlled Hunting Areas

The existing CHA boundaries have been approved by DLUPU, DDC, Land Board and NWDC. The intention is to gazet the boundaries in 1994.

For the detailed descriptions of the CHAs of Zone 6 reference is made to Appendix 3. General descriptions of the boundaries of the CHAs are given below.

The residents of NG 1, NG 3, NG 4 and NG 5 can benefit of the wildlife resource, since these areas are zoned for community wildlife utilization.

NG 2 (NxauNxau) is for Citizen Hunting and NG 6 (Tsodilo) is for Photographic Use.

4.5.2 Description CHAs

There are two aspects to boundary descriptions, which can sometimes be conflicting with each other, viz. visibility in the field, and clear, proper and water tight description in the gazette.

The natural features of the area have been used as much as possible, which are often the (almost straight) fossil valleys or interdunes.

This however posed a problem: the settlements and roads are concentrated in the valleys. If these valleys would be chosen as boundaries of CHAs, it would mean that people that live here can hunt either north or south of the village. Presently people hunt both, north and south depending on availability of game.

Secondly, the river valleys attract more game, and people hunting from either side of the boundary would hunt in the same valley. In the valleys used as boundaries no large concentrations of game are found.

The boundaries selected are, as far as possible, valleys, not inhabited by people, with little game, if possible with well used tracks and no settlements or cattleposts. In this way it is thought to have as little impact on local hunting patterns as possible.

The same aims are followed with the definition of the boundaries as were used for the Okavango Delta WMA (v.d. Heiden, 1991), i.e.:

- a. Where possible distinct, recognisable and known geographical features have been used in the descriptions;
- b. Each boundary is described as running from point to point. These marker points are numbered according to the areas they separate, e.g. NG/1/2 or NG/3/4/5. Where more than one marker

point is established along a boundary a letter is added to the number, eg. NG/1/2/A and NG/1/2/6/B.

Each marker point is described in UTM coordinates. Since the UTM coordinates are read from the 1:100.000 maps a 100 metres accuracy is used. If the marker points are going to be established in the field and thus surveyed, a higher accuracy can be obtained eventually;

- c. All boundaries and marker points are drawn on the 1: 250.000 maps. An annexure is attached to this report with all marker points and their coordinates (Appendix 3).

The CHAs are shown in map 4, a general description is given below.

NG 1: Gani, Xaudum and Chukumuchu

The eastern boundary of NG 1 is the boundary of zone 6, or the cattle trek route, (which is soon to be cleared and graded under labour intensive projects).

The north and western boundary of NG 1 is the International Boundary with Namibia.

The southern boundary is the dry river valley in which Xabacha (1) is located, from Xabacha the road is followed to Tjinipo cattlepost, from Tjinipo the molapo is followed in an easterly direction for 13 km, the first well at Tuxamecha. From there northwards in a straight line for 7 km., across Xomxago and Matanga molapo and Tuxamecha lands to where the road Chucumuchu-Tsodilo is intersected. This road is followed in easterly direction up to 6 km. west of Tsodilo (kgotla); from here the boundary of NG 1 runs resp. in north, west, and southerly direction, at a distance of five km. of the Hills. Where the boundary intersects the road Tsodilo-Thamacha, this road is followed in easterly direction, up to where the cattle trek route is intersected.

NG 2: NxauNxau

The northern boundary is the dry river valley in which Xabacha is located, from Xabacha the road is followed to Tjinipo cattlepost, from Tjinipo the molapo is followed in an easterly direction for 13 km, to the first well of Tuxamecha. From there northwards, across Tuxamecha and Matanga molapo to where the road Chucumuchu-Tsodilo is intersected, just north of Tuxamecha lands. This road is followed in easterly direction. The boundary runs just south of the present arable fields of Tsodilo, along the road to Thamacha to where the cattle trek route is intersected. The eastern boundary is formed by the cattle trek route, which is followed south-east and south, up to a point where the road Etsha-Nxaunxau is intersected.

The southern boundary is formed by the Etsha-Nxaunxau road, which is followed in westerly direction, to the turn off to Senai and Mokgalo cattlepost. This valley of Senai and Mokgalo is followed for appr. 35 km. from where the boundary goes due south for 4.5 km. From there the boundary follows the same valley, almost due west. Near the western border Sankora valley is crossed but the

same valley continues across Sankora. The western boundary is formed by the International Boundary with Namibia.

NG 3: Qooshe, Qangwa, Dobe

The northern boundary is formed by the Etsha-Nxaunxau road, which is followed in a westerly direction, to the turn off to Senai and Mokgalo cattlepost. This valley of Senai and Mokgalo is followed for appr. 35 km. from where the boundary goes due south for 4.5 km. From there the boundary follows the same valley, almost due west. Near the western border Sankora valley is crossed, and the same valley continues and is followed, across Sankora. The western boundary is formed by the International Boundary with Namibia.

The southern boundary starts just north of Xgi, near Qubi. This is an old, abandoned cutline running due east. This cutline is followed to where it intersects with the road (cutline) from Magopa to Xaixai, which is followed in southern direction up to Xaixai. From Xaixai the road towards Tsau is followed in easterly direction to a point at 22°00 E (just south of BPP 152). From here the eastern boundary of NG 3 starts, running due north to the intersection with the cattle trek route. The trek route forms the boundary up to the intersection with the road Etsha-Nxaunxau.

NG 4: Xaixai

The western boundary of NG 4 is formed by the international border.

The northern border starts just north of Xgi, near Qubi. This is an old, abandoned cutline running due east. This cutline is followed to where it intersects with the road (cutline) from Magopa to Xaixai, which is followed in southern direction up to Xaixai. From Xaixai the road towards Tsau is followed in a easterly direction for appr. 63 km. Here the turn-off is found towards Xhaba cattlepost.

The road from the turn off to Xhaba forms the southeastern boundary for NG 4. From Xhaba cattlepost the top of the escarpment is followed in the same direction, in a straight line to a point on the International Boundary, across the Veterinary Fence in Namibia.

NG 5: Kadhu Pan

On the western side the boundary is formed by the International Boundary with Namibia, starting from the Veterinary Fence in Namibia, running due south.

In the south the boundary is formed by the Kuke fence, running due east up to 22°00 E.

On the eastern side the boundary starts at 22°00 E, the boundary of Zone 6, up to the intersection with the road Xaixai-Tsau.

The northern boundary follows the Xaixai-Tsau road in a westerly direction, up to the turn off to Xhaba cattle post. The road from the turn off to Xhaba forms the boundary for NG 5. From Xhaba cattlepost the top of the escarpment is followed in the same direction, in a straight line to a point across the Namibian

Veterinary Fence on the International Boundary.

NG 6: Tsodilo

The southern boundary starts at a distance from 6 km. from the cattle crush, along the Thamacha-Tsodilo road. The boundary follows the road for a short distance, but does not bend northwards towards the village but continues almost due west, south of the lands areas of Tsodilo, to a point along the road, some 6 km. west of the kgotla.

From here the boundary runs resp. north and east, at a distance of appr. 5 km. from the Hills (the hills includes some small rock outcrops 2.5 km northwest of the small hill as well). The road Tsodilo-Samuchima is crossed at a distance of 8 km. from the centre of the Hills where the cutline/ road starts. From here the boundary runs south-west to the point of intersection with the road Thamacha-Tsodilo.

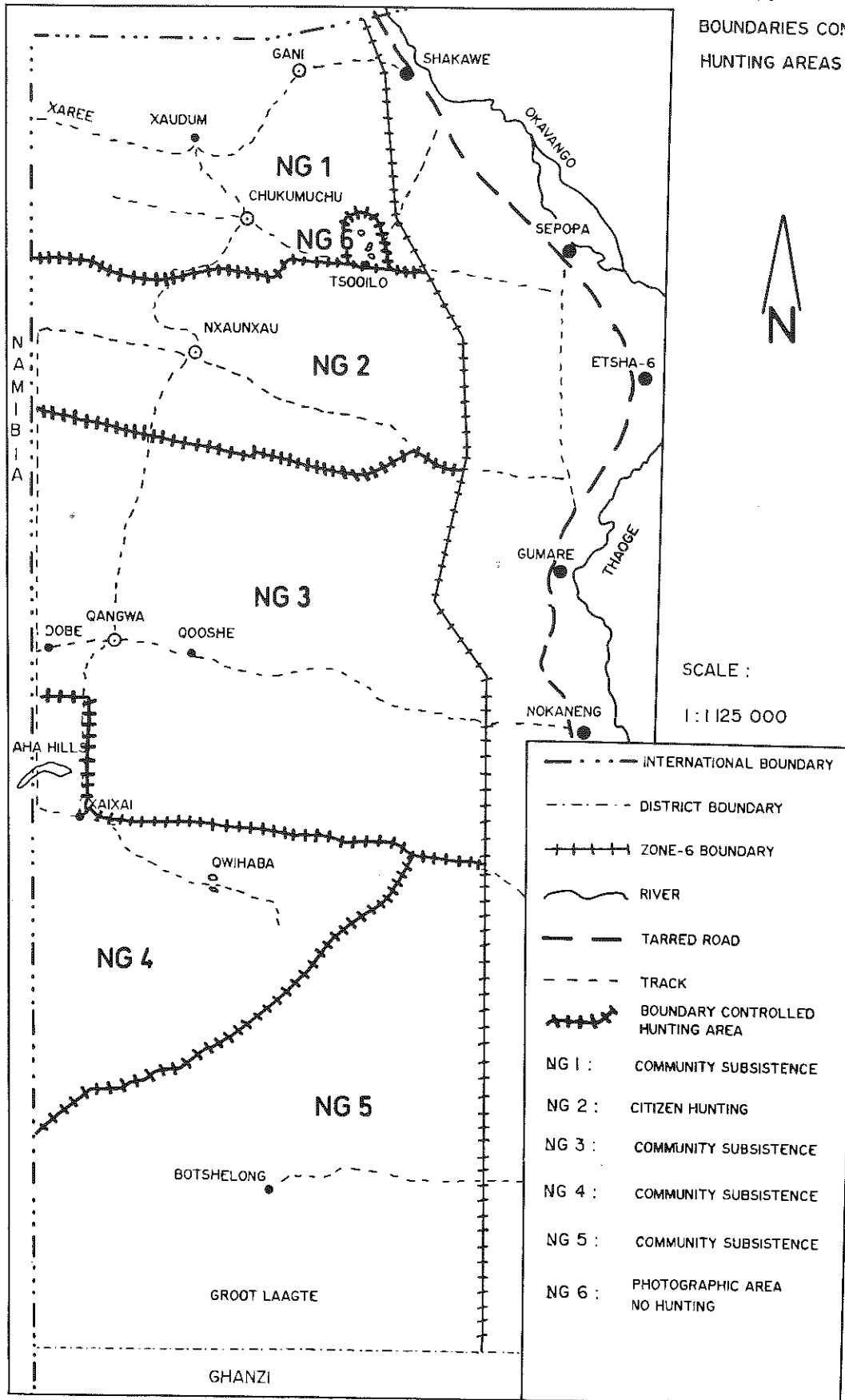
Although it is attempted to follow as much as possible distinct, recognizable natural boundaries, this has not been achieved in all areas. It is therefore recommended that some areas are demarcated, preferably through the construction of a cutline, but otherwise with boundary markers.

NG 6 will probably be demarcated by the National Museum, Monuments and Art Gallery. The eastern boundary of NG 1, 2 and part of 3 is formed by the cattle trek route which is presently being cleared. Also the eastern border of NG 3 and 5 will in due time be cleared as a fire break.

Remaining are then the boundaries between NG 1 and NG 2 (from Xabacha to the International Border), the boundary west of Diniva cattlepost, towards the International border, and the boundary between NG 4 and NG 5. In the case that safari industries might become involved as co-managers, they should construct this cutline.

All these boundaries are straight and rather easy to define in the field.

MAP 4:
BOUNDARIES CONTROLLED
HUNTING AREAS



Drawn by the Department of Town & Regional Planning

4.5.3 Wildlife Management Area

The area most endowed with wildlife resources and veldproducts is south of XaiXai: Controlled Hunting Area NG 4 and NG 5. This area has a high potential for a project involving community based wildlife utilization. For this reason these two areas are designated Wildlife Management Area.

In a Kgotla meeting at XaiXai it was confirmed that these areas are not suitable for livestock grazing, due to the lack of water, the presence of mogau and a poor marketing situation. In the Kgotla meeting on the 4th of December 1992, the land use plan for NG 4 and 5 was accepted by the community.

A large number of water points have been allocated recently in the southern area (NG 5), but only two of them have been developed at date. Despite the fact that quite a few owners have made an attempt to drill (see Vol. I), none has found water and up to now none of the owners has had the resources to develop a water point here, due to the high costs and risks involved in drilling for a water point.

4.5.4 Natural Resources Management Project

A natural resources project in general aims at improved sustainable utilization of natural resources, to increase income, create employment and improve the living situation of the people (see par. 1.1.4).

During meetings with the community of XaiXai in August 1992 suggestions were made of the possibilities of a project based on wildlife and other natural resources. Based on these discussions the VDC from XaiXai wrote to DOL, LUO and DWNP, to invite them to address the Kgotla on possibilities of their involvement in wildlife utilization and tourism, and to clarify in which way the community can be allocated the wildlife quota.

The Natural Resources Management Project (NRMP) in DWNP, DOL and LUO addressed the Kgotla and NRMP did a quick survey to assess the possibility of starting a natural resources management project at XaiXai. Their survey confirmed a high potential for a natural resources project in NG 4: a rich wildlife resource and attractive national monuments, which can be both focus for photographic tourism or hunting. The cultural component, a traditional settlement, with colourful people, pastoral farmers and hunting-gatherers add to that. Most of the community members produce some crafts, which are usually of good quality and can be sold to visitors.

Especially Khadu pan (NG 5) has a good wildlife resource (see also Vol. I par. 1.7.2).

At present there are few residents in NG 5, see chapter 5 and the plan for Groot Laagte for details on settlement development.

After the Tawana Land Board and the North West District Council

had approved this Land Use and Development Plan and had given the go ahead for the implementation of a Natural Resources Management Project, NRMP (DWNP) invited a consultant (SNV/Netherlands Development Organization) to write a project proposal.

The proposal is approved by NRMP/DWNP and the project is likely to start in May 1994. SNV/NDO will provide a Natural Resources Management Advisor (NRMA) whose status will be advisor to the DWNP. In the first phase of the project the NRMA will mobilize community understanding on the concept of Community Based Natural Resources Management and to encourage the residents to adapt the concept to their specific natural and socio-economic conditions.

The set overall long term objective of the project is: to enhance a sustainable use of natural resources to the benefit of the local population (integrating development and conservation), by assisting the XaiXai community with the implementation of the Community Based Natural Resources Management concept, thus strengthening their economic position and claim making capacity, and increasing their control over crucial resources (SNV/Botswana publications, 1993).

As was mentioned earlier, the concept of this project is that the community will be allocated and granted the right to manage the wildlife quota (on behalf of the DWNP). First, the following steps on community level need to be taken before this will be achieved:

1. The community or communities have to form a Quota Management Committee (QMC) recognized by DWNP;
2. Issuing of Special Hunting Licenses will be phased out;
3. Any animals of the quota remaining after subsistence requirements have been accounted for may be sold to resident hunters, citizens, game capture operations and safari companies at market rates. The QMC will be responsible for negotiating sales and distributing the income.

Presently the hunting of desert game is closed in the southern parts of the country, which gives a high demand for trophy hunting.

4.6 Tourism

Tourism is partly linked with wildlife utilization. As mentioned in Vol. I, tourism focuses on two areas: Tsodilo and Qwihaba.

The features which form the main attractions for tourism are:

- The national monuments (Tsodilo Hills, rock paintings; Qwihaba Caves);
- A natural environment, scenic open valleys with wildlife and the isolated Aha Hills;
- Small, rural and rather unspoilt villages: XaiXai, Tsodilo;
- Rich (but dispersed) wildlife resource.

Both Tsodilo Hills as well as Qwihaba Caves are in the

conservation area which secures these National Monuments. A major effort to conserve these areas will have to come from NMMAG and the local communities themselves.

At present the population at Tsodilo is not structurally involved in tourism, in XaiXai the people are not involved at all. Both areas face similar problems, vandalization of the monuments due to lack of control. Both areas are poorly accessible, due to bad roads.

Based on the aims of the plan, it should be attempted to create certain employment based on these resources.

Secondly, there should be a good financial return from these resources since the areas itself are not well endowed with other natural resources, and counts a large number of people which have a very marginalized existence base.

Thirdly, the monuments should be conserved for the future, further degradation should be halted.

The possibility to develop a trust whereby the local community manages the various resources and receives (partly) the benefits from the utilization of these resources should be looked into.

For Tsodilo Hills this should be achieved without increasing the numbers of tourists too much. Here the NMMAG will be in charge of most operations. It is highly important that the Museum appoints a liaison person in Ngamiland, since the communication with the district is very poor in all respects.

The number of tourists around XaiXai is low; the potential to increase it considerably are hampered due to long, bad roads, constrained access to the area. The only way to overcome this constraint would be to have 'commercially oriented marketing', a safari industry which has the means to make high investments, which can afford to fly people to XaiXai.

At the same time 'conventional' tourists can continue to visit the area.

The village plans (par. 6.4 and 6.9) contain details on tourism development, including a site museum at Tsodilo.

In Tsodilo and Qwihaba area camp sites should be developed and maintained under the responsibility of the VDC, and income would go to the community. Firewood will be collected in selected areas by residents, and sold for a fixed price to tourists.

Tourists will be guided by residents, possibly involving alternative means of transport like horses or donkey carts.

4.7 GATHERING

4.7.1 Gathering Areas

Sometimes gathering areas are included in the village land use plans. It is attempted to protect some of the areas, presently most utilized for gathering. They are only zoned as gathering and ploughing area when the people expressed that wish.

The zoning should give enough protection to ensure that veldproducts will remain available in the future.

In areas zoned for gathering no cattle posts should be established. Livestock grazing is a main conflicting land use with gathering, which was acknowledged often by the people, but this has also been stated in literature (see p.118, Vol. I). The gathering areas often coincide with the areas zoned for arable farming, or they are adjoining lands areas.

4.7.2 Mongongo

Mongongo is the most important veld product, since it is very nutritious and a staple food for many people. Mongongo should be protected as much as possible, to secure the resource base of the people.

The use of mongongo for crafts should be discouraged, e.g. through marketing organisations. If they would adhere to a strict policy of not accepting any crafts made of mongongo the production would probably decrease, or be limited to objects for domestic purposes only.

In addition, a council bye-law can prohibit to fell mongongo trees, and the mongongo can be protected under the new forestry legislation, like the Baobab.

Mongongo might sometimes be killed by veldfires; when asked why some trees will burn, the answer from a spokesman was: "sometimes they burn, from some trees the bark is too dry". Firebreaks in the forestry management plan should be designed in such a way that mongongo groves might receive optimal protection. The location of the groves is depicted in map 6, Vol. I.

4.7.3 Commercial harvesting veldfood

Veldfoods are only occasionally harvested for sale or barter. These mentioned were moretlwa, mokgomphata, mogwana, mogorogorowane, mongongo and motstotsojane.

Commercialization of gathering is presently not anticipated, since harvestable quantities are often too small for commercial purposes and the area is rather inaccessible.

Few products are an exception in this respect. One of the interesting products would be mogorogorowane (*Strychnos* ssp.), which is readily sold at points like Shakawe or Mohembo.

With its wooden skin it would be well suited for transport over bad roads; however, at present a very common complaint is that mogorogorowane is depleting, so the scope for commercial harvesting seems too limited, besides conflicting with the subsistence users.

Morama bean might have some potential for marketing, since the

demand in Ghanzi district is too high to keep up with. An additional survey would be needed in some selected areas to establish whether it would be possible to start up a project based on this product.

Other fruits have limited attractiveness outside the area. No Mophane worms are found, nor sengaparile or devils claw.

4.7.4 Thatching grass

Other veldproducts (non-foods) do have potential; especially for thatching grass which has quite a demand, mainly in the rural areas.

Thatching grass seems most important in the north. Species like mokamakama is especially wanted in the region. Thatch is of special importance for the resource of poor women, which earn some modest income from cutting grass.

Middlemen seem to reap most of the benefits; markets can be investigated, in Maun, Gomare or Shakawe, to see what the real value might be. Support can possibly be provided through a marketing organisation, if presently the local benefits are too limited.

At present some 16 % of the people cut grass to sell (Vol.I), but almost all households collect grasses for their own use. Not enough data are present to indicate whether harvesting is sustainable or not. This might need further investigations in those areas where thatch is most important, e.g. around Gani, NxauNxau, Dobe and XaiXai.

The main constraint is the transport, bad roads and inaccessibility of the areas. The northern area seems to have best stands for thatch, but also here more research is needed.

4.7.5 Beekeeping

In Ngamiland West it seems that still many bee swarms are present; people make extensive use of the resource. Where attempts were made to get people interested in beekeeping, they usually failed because people, although they showed interest, did not collect bee swarms or, if they did, the bees often absconded.

It therefore seems to be more appropriate to harvest, in a sustainable way from the natural resources.

For beekeeping emphasis might be on educational aspects, to stimulate beekeeping at the schools in Zone 6. This will enable education on ecology, and the importance of conservation of the host plants.

The zoning of some areas for ploughing and gathering might conserve most vegetation types here, and in this way it might

ensure long term resource utilization.

Not known is how far the harvesting of honey is sustainable. It is likely though that farmers attempt to harvest in such a way that it will enable them to come back at a later stage to harvest there again.

Further research is needed to assess this, and to enable advice on alternative ways of harvesting.

4.8 Forestry

At present no comprehensive plan can be prepared for forestry in Zone 6, since insufficient data is available on the harvestable quantities of timber.

In January 1994, the Forestry Programme for Botswana started in Ngamiland. This project which is funded by the European Community falls under the Ministry of Agriculture and focuses in particular on the conservation and improved management of woodland resources in order to reduce the rates of deforestation.

Simultaneously continued energy supplies to rural households will be ensured and in addition, emphasis is placed on developing the productive potential of forest products in order to create employment and income generating opportunities, and therefore contribute to household food security.

An important component of the project is that technical and financial assistance will be available to those individuals or communities who wish to develop such activities as back-yard nurseries, woodlots, collection and distribution of fuelwood and poles, wood carving and other small-scale craft enterprises, and the promotion of "food from the forest" schemes which will include veld products, fruit and mopane worms.

According to the project document direct financial assistance can be given to NGOs, Brigades, communities and individuals for forestry projects that meet the objectives of the Programme (up to a maximum of P10,000 each).

At this stage the consultants are still in an orientation phase, but it is expected that within the first half of 1994 a more detailed project document will be available. The project is planned to be completed in 1997.

Forestry practises in the Western Communal Remote Zone should focus on small scale extraction of timber and local processing of the logs; no raw logs should be exported. It is recommended to have low impact harvesting, which can be with mobile or portable band saws in the bush. Surplus value should be added by processing the timber in Botswana and create additional local employment at rural community level.

The planks can be sold in the region (as is done presently at Samuchima), the price received is considered to be good.

Preferably the wood should be locally processed, to derived products as furniture, kgotla chairs, doors and craft items. Further study is needed to identify other products with a good potential, as well as demand (locally) and the pricing of products at local domestic markets. The BAs or RIO are requested to look further into these aspects.

Furthermore training is needed, to improve the quality of the products. This can be linked with existing courses of RIIC in Kanye, but also regional control is needed. Presently some courses are being organized already, as outcome of the Kgotla consultations in the remote zone.

It might be considered to have an advisor/instructor for carpenters, who can advise local producers, train them further to improve the quality of the product, to identify new products and to assist in marketing of products.

It is proposed that applicants for (small scale) timber extraction are allocated a 'craftsmanship' permit, which allows them extraction in the order of some cubic metres per month.

CHAPTER 5: HUMAN RESOURCES, SOCIAL SERVICES AND INFRASTRUCTURE

Introduction

In this chapter the development-oriented aspects will be dealt with. In Botswana there is a well defined development planning process. Therefore development planning for Zone 6 is not something new: there are many plans, facilities have been created over the last few years, policies have been defined. Very relevant in this respect are the current National Development Plan (NDP-7) and District Development Plan (DDP-4).

This chapter will start with an overview of the general conditions for development followed by general policy assumptions and a section about human settlements. Thereafter sections on relevant sectors like education, health etc. will follow. In these sections first of all an introduction will be given, among others discussing criteria and needs for development. After that, an overview of projects already included in existing plans for the concerned sector will be presented in table form. Each section will be concluded by proposed changes to the current plans, so that the consequences of this Land Use and Development Plan for the development planning will be clear to the reader.

5.1 Conditions for Development

The area is called "remote zone". The most striking feature is the extremely low population density. The total population figure of the whole area is 3793 (1991 Population Census), which means a density of 0.11 person/km² (or 8.7 km²/person). Remote mainly refers to the lack of basic infrastructure. There are no tarred roads, limited educational facilities, limited health facilities. The effective operation of these facilities is severely hampered by lack of communication facilities. No telephones, limited radio connections, bad roads and improvised postal services. The few facilities that exist are mainly from recent date; for many years the area was even more "remote". The new developments have not yet come to full fruition. For example the effect of schools on educational level is still very little. Consequently, the human resource base necessary for modern development is extremely poor. Illiteracy is rife; there is very little experience with development initiatives. The natural resources have offered only limited possibilities for securing a reasonable living so far, as described elsewhere in this report.

Please refer to the Baseline Survey (Volume I of this report) for more details about the existing resource base.

5.2 General Policy Assumptions

It is not likely that the population density will change drastically in the near future, mainly due to the poor resource base. Even though some influx of people might occur in future due to greater accessibility and "push factors" in areas outside zone 6, a dramatic population growth is not anticipated. Even if a number of new boreholes will be drilled and cattle posts established, the settlement pattern will be very scattered and population density will remain low. Therefore developments will be rather limited in extent as it cannot be justified to spend large amounts of money for a handful of people. On the other hand the Government is committed to provide basic services like schools and health facilities to all people in the country. Since people have been living in the concerned area for a long time, provision of those services and improvement of access to them is justified and should be attempted at as much as possible.

Resettlement of people now residing in zone 6 can be considered, but this option should only be chosen with utter restraint. It should only be done when the concerned people express their willingness to move. It has to be accepted that settlements will have to be rather scattered anyhow because of the nature of the resource base.

The main objective is for the inhabitants to reach and maintain self-sufficiency. Food production should be stimulated, in livestock as well as in arable farming. Mechanisms for improvement are discussed in Chapter 7 and will not be dealt with in this chapter. Of more concern here is the objective of employment creation and income generation, especially in the secondary (industry) and tertiary (services) sectors. People need to earn additional income to be able to buy food when their own food production or gathering is low. Also other expenses need to be met, like transport charges, education of children, health, clothing etc.

It is nowadays widely recognized, that for any development programme or project it is important to consider the long term perspective: sustainability of activities should be aimed at. In addition projects should benefit both genders; they should not be disadvantageous for women.

As said before, facilities provided by either Government or NGOs in this remote area will never be of the same level as compared to more populated areas. A balance will have to be struck between justified demands from the people on the one hand and what can be achieved realistically on the other, considering limited financial and other resources.

The proposals for action below are in line with current Government policies. Relevant policies for this chapter are in particular: NDP-7, DDP-4, RAD policy, education policy and the National Settlement Policy (see Chapter 4). At this point in time two major policies are under review: the RAD policy and the education policy. A new draft policy paper about the Remote Area

Dwellers Programme under auspices of MLGLH has been prepared and is being considered by the relevant authorities. With regards to education, the consultations and adoption of the final report by the National Commission on Education is still being awaited. This Commission was established in 1992.

In order not to delay the finalization of this Land Use and Development Plan and to make it as complete as possible, proposals have been included concerning remote area development issues and education, although policies may change soon in these fields. Therefore, these proposals should be taken with caution. In case the proposed projects appear not in line with future national policies, some changes will have to be made. This means that this plan should be used in a flexible way.

1.3 Human Settlements

1.3.1 Settlement Hierarchy

For this paragraph use is made of the recommendations from the socio-economic consultants, Smit & Kappe (1992). Their text is used, as their recommendations seems most valid for the settlement hierarchy of the area. The proposals are in the line with the National Settlement Policy.

Based on existing interrelationships, population figures, distance factors and natural resource utilization Zone 6 is divided into three sub-zones. These sub-zones consist of one or several of the identified sub-regions. Each sub-zone is allocated a central place where services are concentrated and from where production workers operate. The following sub-zones are identified:

Gani sub-zone
This sub-zone only entails the Gani sub-region. The total population of this sub-zone is 1,128 (Population Census 1991).

Chukumuchu/NxauNxau sub-zone
This sub-zone consists of the Xaudum, Chukumuchu, Tsodilo and NxauNxau sub-regions. The total population figure for this area is 1,224 (Population Census 1991).

Qangwa sub-zone
This sub-zone consists of Qooshe, Qangwa, Dobe and XaiXai sub-regions. The total population figure is 1,224 (Population Census 1991).

The mentioned sub-zone already functions like a sub-zone. For example a clinic, a hostel, CDA and FA in Qangwa. The population of the first sub-zone (Gani) is mainly justified by its population figure and its typical characteristic of an

arable farming area (when compared to other sub-regions). Although Gani-centre itself is a (very) small settlement, it is the sub-zone centre as it is most centrally located and several infrastructural developments are already planned. The exclusion of the Xaudum area from this sub-zone needs some explanation as at present developments in Gani are planned to service also the Xaudum Valley. However, the survey showed that the population of Xaudum is more oriented towards Chukumuchu than towards Gani, has different population characteristics and is more oriented towards pastoral farming.

Chukumuchu has the most intrazonal relations in the northern inhabited half of the remote zone. Chukumuchu is centrally located in the Chukumuchu sub-zone, and has the highest population figure. Xaudum and NxauNxau share common population characteristics and similar land use (cattle rearing) with Chukumuchu. Chukumuchu can service Tsodilo sub-region, which is too small to justify major investments. Although years ago a choice was made to develop NxauNxau, resulting in facilities to be located in this village, the idea is that based on inter-relationships Chukumuchu should be the centre. In future time Chukumuchu will be developed as centre for this sub-zone.

Support of developments concerning infrastructure and services in the sub-zone centres entails at the same time a freeze on further major development activities in any of the other sub-regions.

The socio-economic survey from the consultants indicated that there is no place in the remote zone that plays, or can play, a role as centre for the whole area. The population density and figures are very low and the area itself is immense, which makes transportation costs extremely high. Population movements show a strong orientation towards centres outside Zone 6. Internal relations rarely exist which leads to conclude that Zone 6 is not a coherent region.

Based on this it is decided not to pinpoint one place within the remote zone as the central place where services and facilities on a higher level are to be concentrated. Instead, the idea is to underline the present pattern of relations and to make use of the already present centres outside Zone 6: Shakawe, Gomare and possibly, Nokaneng.

Shakawe is considered as next higher service centre for the Gani sub-zone, Gomare as next higher service centre for the Chukumuchu sub-zone and Nokaneng for the Qangwa sub-zone.

The above implies that when planning for the planning zones 1 and 2 (CFDA and CSDA) the interests of the population in Zone 6 is taken into account.

5.3.2 Resettlement of People

As has been mentioned in Chapter 2, a large number of people are

in need to settle.

Mentioned were the people from Kuke gate, people from Kareng and south-west Lake Ngami, and possibly people from Hainaveld.

Also Campbell and Main (1990) suggested the area west of Kareng for resettlement of people. It is a wide open area which has still good land resources, i.e. game and veldproducts.

The land is unsuitable for livestock grazing because of the mentioned problems, especially in regard of water supply, but also Mogau and lack of infrastructure.

Data on soils are presently insufficient, but in the river valleys it is expected that the soils are similar to the areas in the north, although the rainfall is less.

The area is assigned Wildlife Management Area, which secures the wildlife resources, and gives good opportunities to start a NRMP in future time, and to start income generating activities.

At least three groups of people from southwest Lake Ngami have an interest to settle in this area in the west. Two groups have already been allocated a site for a borehole. Their main aim is to be independent and to have a mixed farming system; some cattle, some, ploughing, hunting and gathering.

Since their present situation is rather deplorable, it is felt that these initiatives should be supported.

It should be attempted to keep the population densities low. Large concentrations of people would be detrimental for the fragile environment. The veldfoods would be depleted fast and ploughing areas are too limited. The maximum number of cattle per water point would not be sufficient for a large number of people. A large number of people would deplete wildlife around the settlement.

With a dispersed settlement pattern and a low population these problems can be avoided.

To avoid large conflicts and problems with infrastructure development (esp. roads) it is proposed to have these settlements in a selected area, for example in the southeast along the Kuke fence, where some groups of people are allocated already.

The people should be consulted where they want to settle. They should be allowed to compose groups themselves for these settlements.

Services preferably should be provided outside the area. One larger service centre can cater for all people from the different settlements. It should be considered if this should be a larger existing settlement like Kareng or a new settlement.

5.3.3 Repatriation of People

At the time of writing, a major repatriation exercise is going on which may have rather big consequences for the demographic situation and thus for development prospects. These changes were

not foreseen when the current development plans were formulated.

The people concerned, belonging to the BaHerero and BaVanderu ethnic groups originating from Namibia, had decided to settle in Botswana fleeing the violence of war in their country. Now that the prospects in Namibia are relatively peaceful and stable, a number of them has decided to return to their country of origin. Others have decided to stay in Botswana, where they have been living for many years.

In Zone 6 there were roughly 1000 BaHerero before the repatriation exercise started (27 % of the total population according to Smit and Kappe, 1992). However, at this stage there are no reliable figures of people who have applied to go, at least not for Zone 6. According to records 731 adults have applied to go from the entire district. 1080 children are involved, so the total number of people is 1811. But unfortunately, from the available data it is very difficult to assess the number of people who have applied for repatriation in villages and settlements of Zone 6. In the applications only postal addresses were given and these are mainly outside Zone 6 because there are no post offices in the area. In addition, there is some fluctuation in numbers as some more people apply whilst others hesitate to go at the eleventh hour.

But, according to informal verbal information, substantial numbers are leaving from places like Chukumuchu, Tjinipo, Qangwa and Xaudum.

As stated elsewhere in this report, this group of people are much involved in cattle rearing. Therefore the exodus of people will go together with an exodus of lots of cattle. The Governments of Botswana and Namibia are in the process of preparing a large-scale move of cattle from Botswana to Namibia. For that reason a temporary crossing point and holding ground has been established in Dobe near the Namibian border. A trek route from Nokaneng to Dobe is being provided with water points (5 boreholes, not all of them yielding water). It is still to be decided what will happen with those boreholes after the repatriation exercise is over. The removal of substantial numbers of cattle from the area will of course have a tremendous effect on the environment, most likely resulting in less overgrazing for the time being. But later new cattle owners may wish to settle in the area.

5.4 Physical Infrastructure and Communication

Introduction

It is not expected that traffic volumes will increase tremendously over the forthcoming few years. At the moment traffic is very little. As indicated in the Baseline Survey, the topography favours east - west connections following ancient

river beds. Therefore it is proposed to upgrade the connections between each sub-zone centre and its respective higher service centre, e.g. between Gani and Shakawe and to pay less attention to north - south connections (e.g. between Qangwa and NxauNxau). This is also in line with the settlement hierarchy as described in par. 5.3.1. The roads should be all weather standard and wide enough to allow lorries to use them. Ideally they should be passable for 2x4 vehicles. This may require compacting and grading (see map 5).

In addition, all settlements should be accessible from the sub-zone centre by sandtracks passable for 4x4 vehicles. Bigger settlements and villages like XaiXai may require dirt or gravel roads of reasonable standard, also passable for lorries.

A few places are of special interest for tourists, like Qwihaba caves and Tsodilo Hills. These places, if not already located near roads linking settlements, should be accessible for tourists. It is not a requirement that these roads are passable by 2x4 vehicles. More important is that they should retain a scenic quality. But they should be wide enough to allow safe traffic. Some of the existing tracks are a real hazard should traffic intensity increase: oncoming traffic is not always visible due to vegetation and the roads are too narrow to allow cars to pull out.

There are no tarred roads at the moment; it is not justified in view of the low traffic volumes to consider any tarring for the time being.

Although according to the Tsodilo Hills Interim Management Plan (1993) "mass tourism" to this National Monument is not encouraged, the road Thamacha - Tsodilo - Chukumuchu needs to be improved in order to make the twin sub zone centre Chukumuchu more accessible. An alternative access route from the Etsha - NxauNxau road to Chukumuchu via Xaree instead of going via Tsodilo is technically difficult to realize and would be very expensive.

Increasing access for air traffic could well be considered. Air strips are already existing in Tsodilo, Qangwa and XaiXai (see Baseline Survey). It would be worthwhile to look into feasibility of having airstrips in all villages and major settlements. Air traffic is especially useful for emergency handling.

Connection to the telephone network of Zone 6 villages or settlements is not to be expected in the near future. Fortunately telephones will come nearer: Provision of telecommunication facilities in the higher service centres outside the zone (in Gumare, Shakawe etc.) is under way. But considering the long distances to these places, it is worthwhile developing some other communication devices so that contact with these centres is possible. This would improve health services (especially handling of emergencies), general administration and would be useful for the public. A radio system would therefore be ideal, preferably easily accessible by all departments and even by the general

public. This idea needs some study to look into possibilities and institutional arrangements. There should be a radio in at least each sub zone centre.

Not appearing in the district development plans but only mentioned in NDP 7 is the establishment of a border post in Dobe. This is a possible development in the long term; it confirms the need for improvement of the Nokaneng - Qangwa - Dobe road.

5.4.1 Projects in Current Plans

Project	Location	Planned Completion	Department	Remarks
Road Debushing	Tsodilo - Tamacha	1993	Council - Drought Relief	project at stand-still; not in DDP-4
Road Debushing	XaiXai - Qangwa	1993	Drought Relief	stand-still
Road Debushing	Chukumuchu - Gani	1993	Drought Relief	stand-still
Road Debushing	Chukumuchu - Tsodilo	1993	Drought Relief	stand-still
Road Debushing	Magoraameno - Chukumuchu	1993	Drought Relief	never started
Road Debushing	Magoraameno - Dineva	1993	Drought Relief	stand-still
Airstrip Clearing	Qangwa	1993	Drought Relief	not implemented
Airstrip Clearing	XaiXai	1993	Drought Relief	completed
Border Post	Dobe	before 1997	Min. Home Affairs	in NDP-7

5.4.2 Proposed Changes to Current Plans

Studies should be conducted to assess whether the following road works would be feasible.

Upgrading to all-weather roads passable by lorries and preferably by 2x4 vehicles between Sub zone centres and higher service centres outside zone 6:

- a. Nokaneng - Qangwa road
- b. Thamacha - Tsodilo - Chukumuchu road

c. Etsha 1 - NxauNxau road (this road is of rather good condition already).

Widening of the following roads where necessary to make them passable by 4x4 lorries in order to connect sub zone centres with other villages and major settlements:

- a. XaiXai - Qangwa (already under way under drought relief)
- b. XaiXai - Tsau
- c. NxauNxau - Xabacha - Chukumuchu - Xaudum - Gani ¹
- d. Xaudum - Xaree
- e. Gani - Shakawe

Widening touristic roads, but retaining scenic quality:

- a. Samochima - Tsodilo
- b. XaiXai - Qwihaba

Airstrips should be established in the following places:

Gani, Xaudum, Chukumuchu and NxauNxau.

A study should be conducted to look into the feasibility of having a radio system that is accessible to different departments and organizations and to the general public to convey urgent messages. Preferably there should be sets in all villages and major settlements. Some departments will have their own systems.

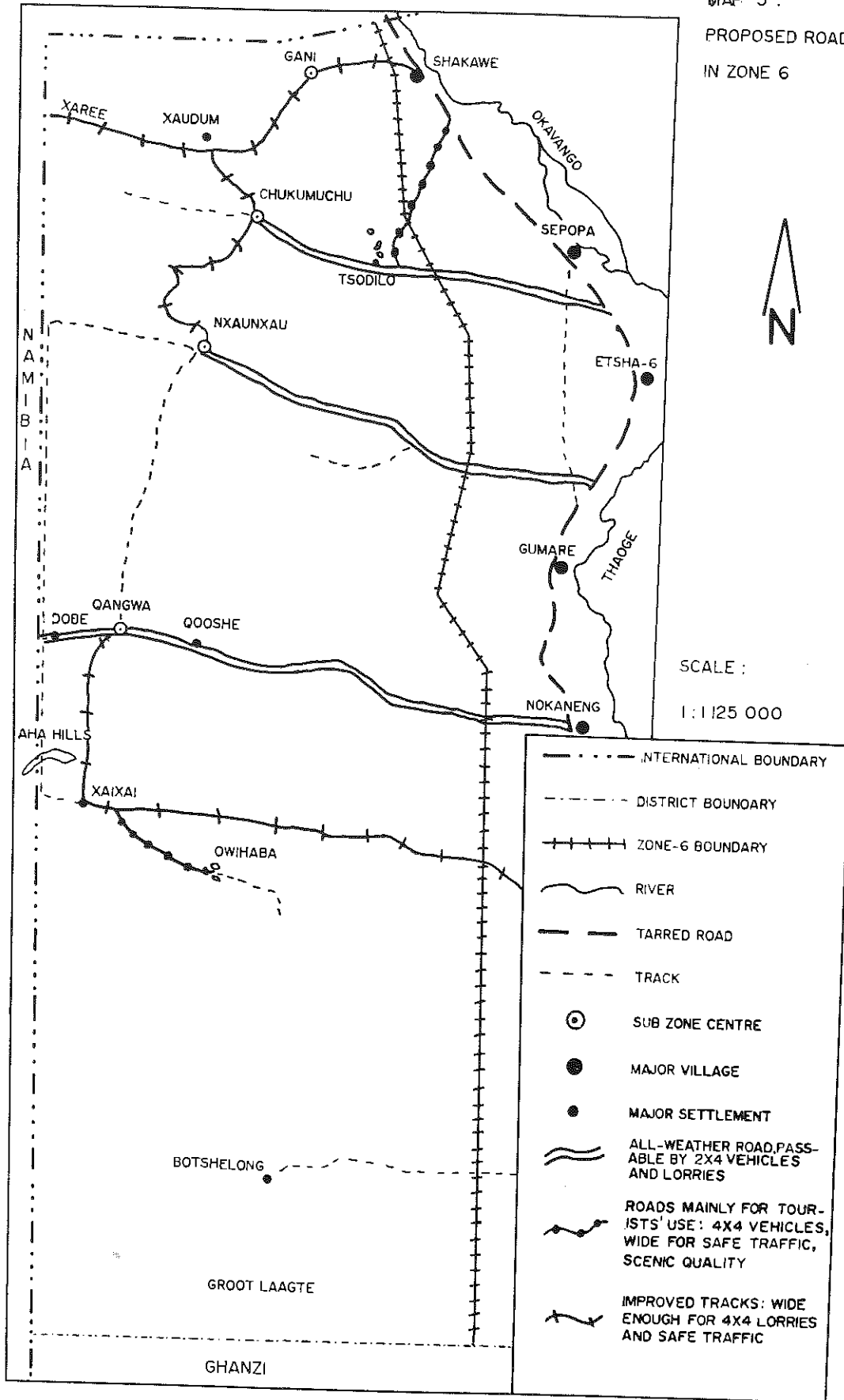
5.5 Water Supply

Introduction

Water availability is a crucial issue in this dry area. The Government can only commit itself to supply the sub zone centres and other recognized villages with drinking water (see map 6). Two boreholes will be needed for each centre, so that water is available in case one of the boreholes has a break-down (back-up facility). In most sub centres reticulation systems do already exist, depending on one borehole each though. Where water availability or water quality from boreholes is a problem (in some places the water is rather saline for example) alternative

¹ Although the connection Gani - Chukumuchu does not meet the criteria for good quality all-weather roads because it does not connect a sub zone centre with a higher service centre but two sub zone centres, it is nevertheless justified to have a good connection between Gani and Chukumuchu: the population density is relatively high.

MAP 5 :
 PROPOSED ROAD NETWORK
 IN ZONE 6



Drawn by the Department of Town & Regional Planning

5.5 Water Supply

Introduction

Water availability is a crucial issue in this dry area. The Government can only commit itself to supply the sub zone centres and other recognized villages with drinking water (see map 6). Two boreholes will be needed for each centre, so that water is available in case one of the boreholes has a break-down (back-up facility). In most sub centres reticulation systems do already exist, depending on one borehole each though. Where water availability or water quality from boreholes is a problem (in some places the water is rather saline for example) alternative water supply techniques will be tried. An example is catchment of rain water using existing roofs, e.g. the roofs of schools, clinics or houses. If large tanks are used water can be supplied for several months. The Council Water Unit is already looking into possibilities.

For major settlements which do not qualify for reticulation systems and boreholes, assistance can be given under RADP for digging of wells. In this way water will be supplied to most areas where people are living.

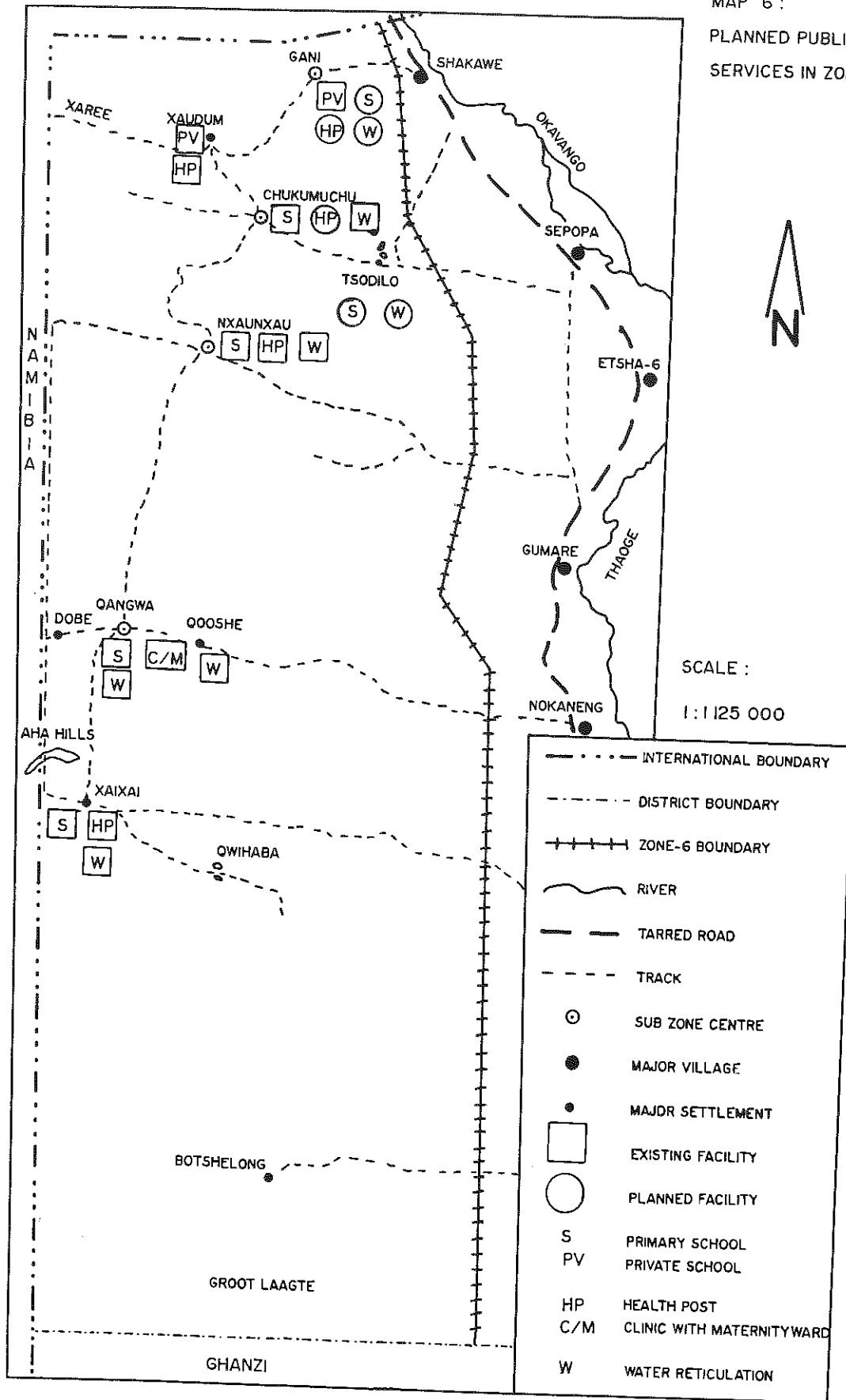
Cattle posts are, of course, usually located around private water points.

In Tsodilo a borehole will be drilled under auspices of NMMAG to supply water for the planned site museum and the staff accommodation.

5.5.1 Projects in Current Plans

Project	Location	Planned Completion	Department	Remarks
Borehole	Gani	90/91	DWA	to be equipped in 1994
Borehole (2nd)	Gani	92/93	DWA	long delay anticipated
Borehole (2nd)	Chukumuchu	92/93	DWA	long delay anticipated
Borehole	Tsodilo	94/95	DWA	not needed: already done by NMMAG
Borehole	Qangwa	96/97	DWA	one drilled by AH&P
Borehole	Tsodilo	93/94	NMMAG	completed

MAP 6 :
 PLANNED PUBLIC
 SERVICES IN ZONE 6



Drawn by the Department of Town & Regional Planning

5.6.1 Projects in Current Plans

Project	Location	Planned Completion	Department	Remarks
Health Post	Gani	94/95	RADP	planned
Mobile Clinic Stop	Chukumuchu	92/93	Council - Drought Relief	ongoing
Mobile Clinic Stop	Dobe	92/93	Drought Relief	ongoing
Mobile Clinic Stop	Tsodilo	92/93	Drought Relief	ongoing
Mobile Clinic Stop	Gani	92/93	Drought Relief	ongoing
Mobile Clinic Stop	Xaudum	92/93	Drought Relief	ongoing
Mobile Clinic Stop	Shaikarawe	92/93	Drought Relief	cancelled

5.6.2 Proposed Changes to Current Plans

It may be considered to provide a health post in Chukumuchu, if mobile clinic visit figures justify such a facility. Further it is proposed to improve the radio systems and provide a few more vehicles to increase the effectiveness of the referral system and emergency handling.

5.7 Education

Introduction

Many complaints that were voiced during the consultative kgotla meetings were about education. Enrolment is low; in some places very few children are attending school, e.g. in Dobe (going to Qangwa school). Some of the reasons given for low enrolment figures and high drop-out rates were: lack of motivation of parents, long distances to schools, language problems (many different languages are spoken in Zone 6), child beating and problems related to staying in RAD-hostels. For a more elaborate description of the existing situation: see section 2.6.3 in Volume I, the Baseline Survey.

This report suggests several possibilities to try to improve the situation. There is not much scope for building many new schools; population figures do not justify such a move. The schools

planned in DDP-4 should still be built. For the planned primary school in Tsodilo the population figures of the catchment area and the potential enrolment should be considered carefully before deciding to establish the school. Perhaps the community is too small for a school. On the other hand the place is very isolated and sending children as far as Chukumuchu is not very desirable. If children would have to go to Chukumuchu a hostel should be built there. When a school has been built in Gani as planned in DDP-4, then all sub zone centres will have primary schools.

Several suggestions have been made to overcome the problems of lack of motivation and long distances. Establishment of day care centres or preschools is one idea. It is suggested to start with some pilot projects; if successful, more preschools could be started later covering many villages and settlements, even in relatively isolated places. This form of education can have several benefits: get children used to educational practices and discipline in a playful way; get the children taught the basics of Setswana which will be the medium of education in primary school; develop creative capabilities at an early age; through involvement of the mothers improve motivation for education of their children and address matters like nutrition, health care etc. One criterion for selecting settlements where to start preschools is that parents are enthusiastic. Inclusion of Dobe is advocated, because hardly any children are attending school from there at the moment. Preschools do not necessarily need a lot of investment. More important is well motivated and qualified staff to assist the schools, in close cooperation with the parents.

Another possibility is to support any local initiative for private schools up to say standard 3. They can be built in smaller settlements and are usually manned by teachers who originate from the same area sharing a common background with the children. Like with preschools, parents' involvement is extremely important. However, in practice the facilities are often very poor and the standard of education is low. The Government may come up with new policies on this issue, following the recommendations of the National Commission on Education. It is suggested now to await the outcome and to decide on policy concerning private schools in Zone 6 later. If private schools are considered feasible, establishing one in the Dobe area would be a high priority because of the extremely low school attendance there. Xaudum and Gani (prior to construction of a primary school) are other suitable places.

Funding of both preschools and private schools (if considered feasible) can be found partly from RADP and probably partly from external donors and NGOs.

Although RAD-hostels are believed not to be the most ideal method to increase school attendance, in view of the fact that not all settlements can be provided with a school they will still be necessary to give those children living far away from school at least a chance to attend classes. Therefore it is proposed to build hostels in all places within zone 6 where a Council primary

school has been or will be established. At present the hostels are too crowded and therefore prone to health problems. This situation is not tolerable and improvements are required. A justification for hostels per location is given in Smit and Kappe, 1992, p 124. Plans are being made to have a limited number of hostels in the District with much better facilities than the existing ones. It is strongly advocated to have one of them within zone 6. NxauNxau is a good location: rather central and with good access.

Another subject that needs more attention, is adult education. Considering the low literacy rate (79 % of the adult population did not attend any school; Smit and Kappe, 1992, p. 20) an intensive literacy programme would be justified. There is scope for expanding activities to promote adult education in this area. Only one TSP attached to Non-Formal Education stationed in NxauNxau was mentioned in Smit and Kappe's report (1992). There has been a literacy group in Gani, but since the group leader left it has not met. In Chukumuchu a new group has started recently, Literacy Assistants are not based in the area: the places are covered by Literacy Assistants in Nokaneng, Gumare and Shakawe. It is suggested to investigate possibilities to expand literacy training, through Government channels but, if necessary, supplemented by NGOs. When the latter channel is used it would be worthwhile to link such activities to preschools and private schools. Promotional activities should be emphasized because motivation is likely to be very low.

Secondary education will for the time being only be available outside Zone 6. Especially the CJSSs in Etsha and Seronga are interesting since they have boarding facilities. Quite important are the Brigades in the Sub District, who offer vocational training. Agreements should be reached with the Boards of Trustees to guarantee sufficient places for trainees from the RAD areas.

5.7.1 Projects in Current Plans

Project	Location	Planned Completion	Department	Remarks
Primary School	Chukumuchu	90/91	NWDC	completed in 1993
Primary School expansion	NxauNxau	90/91	NWDC	completed
Primary School expansion	XaiXai	90/91	NWDC	under retention
Primary School	Gani	90/91	NWDC	not started; no water available
Primary School	Tsodilo	93/94	NWDC	to re-assess potential enrolment

5.7.2 Proposed Changes to Current Plans

As discussed above, it is proposed to re-assess the need for a primary school in Tsodilo.

New projects to be added to the current plans are as follows.

To start a pilot project trying the concept of preschools in a limited number of settlements, including Dobe. Depending on success preschools could be started in many other settlements later.

To establish hostels in XaiXai, Chukumuchu and Gani and to improve the living conditions in the existing hostels. One hostel with very good facilities should be established in NxauNxau.

Setting up of private schools will not be stimulated until the new Government policy on education is known.

To investigate possibilities to strengthen the adult education programme (literacy training) through Government eventually supported by NGOs.

5.8 Non-Agricultural Income Generation

Introduction

RADP has, as one of its components, assisted RADs in providing them with skills to start small businesses. The emphasis has been on basic training in technical and business skills so far. Only recently support to starting up actual businesses has begun. In order to continue what was started, it is proposed here to consolidate that support, giving training but also moving more and more into support for business operations. A lot of limitations have to be taken into consideration here. Bottlenecks for example are distances to prospective markets, low incomes and therefore low purchasing power in the area itself. Nevertheless there is some scope, for example for small shops, perhaps some dressmaking, bakeries, etc.. More promising seem to be activities linked to culture or natural resources, e.g. craft making, biltong production and leather-work. Other tourism related activities, especially in Tsodilo and in Qwihaba, could include sale of firewood, guiding tourists, selling postcards and of course local crafts.

Tsodilo needs special attention. A management plan for that area is now under preparation by the NMMAG with inputs from the Tsodilo Hills Advisory Committee. Although too much influx of tourists and new residents should be avoided in order to protect the uniqueness of this national monument and its surroundings, it would not be fair to deny local people to benefit from the opportunities that may arise in the future. Therefore some tourism related activities should be encouraged (see 9.4 for details).

One possibility suggested in the past for some bigger settlements may still be relevant, viz. the establishment of cooperatives. Activities could include retail shops and craft production. In other remote areas in Botswana cooperatives have been established.

Because of the bad marketing to outside the area, some new channels should be developed, especially for crafts. Possibilities include starting a new marketing organization and revitalizing old ones like !Kung San. Other craft centres in the sub district could also be used, like the BCC outlet in Etsha or the Ngwao Boswa Centre in Gumare.

5.8.1 Projects in Current Plans

Project	Location	Planned Completion	Department	Remarks
Butchery	NxauNxau	not specified	S & CD	LG 109
Craft Shop	Qangwa	not specified	S & CD	LG 109
Guest House	XaiXai	not specified	S & CD	LG 109

5.8.2 Proposed Changes to Current Plans

To engage in the following activities.

Support people who want and who are able to start businesses, through either RADP, IFS or NGOs.

Organize training for potential entrepreneurs.

To investigate the feasibility of cooperatives, for consumers as well as for producers. People in Chukumuchu and Tsodilo have indicated their wish for such cooperatives.

To develop a marketing organization for crafts (NGO).

Develop tourism related activities, especially in Tsodilo and in Qwihaba/XaiXai.

5.9 Local Administration and Social Welfare

Introduction

According to the survey (Smit and Kappe, 1992) local institutions like VDCs and PTAs are not functioning adequately in many places. More support from the relevant departments is needed here such as training and supporting/monitoring activities.

Tribal Administration is not well equipped with housing and office accommodation. This needs to be addressed, although it will require some time. There is only one customary court featuring in DDP-4 for zone 5, namely in Qangwa. Even this one is low on the district priority list and is expected to be constructed only long after the expiry of the current plan in 1995 because the programme is far behind schedule.

It may be considered to station paid Headmen in major settlements like Gani and Chukumuchu.

Houses for any extension department including the District Council can be provided under the accelerated housing programme. Unfortunately also this programme is very much behind schedule.

Another issue featuring high during the consultative kgotla meetings was the assistance to destitutes. As described in Volume I, the number of destitutes in Zone 6 is very high indeed. Efficient assistance to them is hindered by factors like poor communication facilities, lack of transport and insufficient staff (S & CD). On one hand there is scope for improvement of this assistance, on the other attempts should be made to limit the numbers dependent on such assistance by supporting them to find ways to earn their own living.

5.9.1 Projects in Current Plans

Project	Location	Planned Completion	Department	Remarks
Recognition as village	Gani	as soon as possible	several	awaiting water supply
Customary Court	Qangwa	95/96	TA	delays expected
Accelerated Housing Programme	not specified	ongoing	NWDC/ DABS	delays expected
2 VDC houses	Chukumuchu	92/93	Council Drought Relief	ongoing
4 VDC Houses	Gani	92/93	Drought Relief	ongoing
4 VDC Houses	Qangwa	92/93	Drought Relief	completed
4 VDC Houses	XaiXai	92/93	Drought Relief	ongoing
6 VDC Houses	NxauNxau	92/93	Drought Relief	completed

5.9.2 Proposed Changes to Current Plans

More support in the form of training and follow-up visits should be given to VDCs and other local institutions by all extension departments, but especially by S & CD.

Assistance to destitutes should be made more efficient by making staff and equipment available for S&CD.

CHAPTER 6: VILLAGE ZONING AND DEVELOPMENT PLANS

Introduction

This chapter contains the detailed land use and development plans for the sub-zones of Planning Zone 6. All plans follow the same format: an indication of the consultations and discussions that were held with the residents is followed by main points that are relevant for the development plan. Then a description is given of the land use zones, which is followed by the development issues, more detailed recommendations on some of the sectors, e.g. livestock development or infrastructure development for the sub-zone.

Land use plans are only made for the villages where people expressed in Kgotla meetings that they wanted to have such a plan. It must be stressed that the distinction in various zones with specific land uses are suggested by the local communities involved and have been discussed in various Kgotla meetings.

6.1 Gani Area development Plan

This is the only village development plan not yet available. In short future time a plan will be made.

All water points here should be surveyed. The land use is very much entangled, with cattleposts spread out in the ploughing areas. Once all water points are surveyed it will be possible to draw up a plan for zoning land for arable purposes and grazing purposes. Farmers showed interest to move their livestock to the west, provided that they will be assisted by the Government.

Assistance can be given under the Water Development Scheme from the Ministry of Agriculture, as long as the farmers have not benefitted from this scheme in the past.

A Technical Assistant should be based in Gani, since there is much interest in ploughing in this sub-region. The TA based here should supervise the Field Assistant which should be based at Chukumuchu.

6.2 Xaudum Valley Development Plan

The plan for Xaudum is based on meetings with the community of Xaudum on 15/5/1992. The people expressed here that they have little interest in a zoning plan, or rather, "Government is the expert, they should zone the land."

A very positive welcome came from the community of Xaree, at the working group's meeting on that same date. People have a more diversified resource base at this western part of Xaudum valley, and they want to have land reserved for ploughing and gathering.

6.2.1 Summary of Issues

- a. Severe land degradation apparent, and acknowledged by residents. Degradation has resulted in reduced carrying capacities.
- b. Many infectious diseases prevail since most people take water from open wells where also cattle are watered. Tapeworm infected people cause 'measles' in livestock.
- c. Poor road connections with other areas.
- d. In the past Xaudum valley had a lot of game, like eland and giraffe. Presently still some game is present but due to overgrazing and overhunting most game has disappeared.
- e. Bad labour conditions are prevalent at the cattle posts, often people do not receive any payment.
- f. Erosion prone soils are unsuitable for arable farming
- g. Predation by wildlife, especially wild dogs, is prevalent

6.2.2 Land Use Zoning

Mixed farming

All of the eastern part of Xaudum valley is zoned as mixed farming area, in accordance with the wishes of the people.

Arable farming and gathering areas

The soils in the valley are only very marginally suitable for arable farming, part is even permanently unsuitable, since the soil is saline and toxic to many plants.

Better soils are found north of the Mahorameno, at Sangoka. This area is zoned for arable farming.

East of Xaree, RADs have started ploughing at Kolonje. The soils here, on the edge of the valley, are very marginally suitable: S4m. This area is also zoned for ploughing. Since it is not allowed to establish boreholes for livestock within 4 km. of the fence along the border, this area is zoned for arable farming and gathering.

Main activity to sustain a living is gathering, which is done by 80% of the people. Only people from Xaree expressed the wish to protect their gathering area.

Veldfoods are south of the valley: mokgompaha, moretlwa and mokolwane. This area is also zoned for ploughing and gathering, up to Maronga and Kareto cattlepost in Chucumuchu valley, 16 km. south of Xaree.

Livestock development area

Between Mahorameno and Kudinyama as well as around Zao are far

too many wells, too narrowly spaced. No further expansion of cattleposts in these areas is allowed; too much land degradation occurs, according to the people this is due to the high number of people living here nowadays.

Wildlife utilization

This area is zoned as CHA NG 1: community wildlife utilization.

Residential areas

No residential areas are designated in Xaudum valley.

6.2.3 Development Issues

Livestock Development

A follow up on predation on cattle has been made (see par. 4.4.3). No bait will be provided, due to the protected status of wild dogs.

Crafts Development

In the far west, near Zao and Kolonje, baskets are made, but for domestic use only.

Infrastructure Development

The road from Xaudum to Gani should be improved. Possibly this project can be brought under drought relief.

Health, water supply and sanitation

The present water situation forms a real health hazard, which is shown by the presence of infectious diseases in both people and cattle. Besides, small boys are taken from the riverine areas to do hard labour in lifting water for the cattle at the shallow wells.

Pit latrines should be actively promoted to avoid further spread of diseases. The latrines should be on the sandveld, to avoid contamination of groundwater. Once pit latrines are constructed, the Health Department should start a programme against parasites in this area.

To improve the quality of the water, development of concrete lined wells, equipped with handpump, can be stimulated. Research was done recently into the suitability of a new type of handpump (from western Africa).

The pump seems to be suitable for Botswana, it can pump about 1 litre per stroke or appr. 60 l. per minute, which would make it suitable for livestock as well.

The pump can be produced locally, repairs are easily done in the village and the costs are low. The pump, if imported, costs \$ 400,-, but probably less when locally produced. (Mr. Burton, Director BTC).

The lining of the well can be done with locally fabricated concrete rings, provided the sand is good enough to make concrete.

Further research and consultation is needed to assess whether it would form a feasible option for Xaudum valley, and possibly for Gani valley as well. A demonstration project should be started.

6.3 Chukumuchu Area Development Plan

The people from Chukumuchu were most eager for a land use plan. The plan was discussed initially in a meeting between the Zone 6 Working Group and the community on 13/5/1992. They were visited again in the week of 29/7/1992, and further discussions were held with the headman and VDC. This time the boundaries for land use zones were established and confirmed in the field, with VDC, headman and 5 villagers, together with the LUO. General agreement was reached on these boundaries.

6.3.1 Summary of Issues

- a. Most people have arrived over the past 5 years, and have started ploughing here.
- b. Chukumuchu is development nucleus under the RADs policy.
- c. Although Chukumuchu is a RADs settlement, Basarwa refuse to settle here.
- d. Until recently 80 % of the fields were self allocated but now many land applications and ALDEP applications have been made.
- e. Many farmers do not own implements and half of the farmers have to borrow draught power; they rely on the Njambe system.
- f. Livestock predation occurs regularly, especially at the more distant cattle posts.
- g. Chukumuchu is a RADs settlement, recently a borehole has been drilled and a school has been constructed.

6.3.2 Land Use Zoning

Arable farming and gathering areas

The soils at Chukumuchu are reasonable, at least for this area: the classification is S3m, marginally suitable. Farmers have cleared an area and intend to expand their fields much further. They are presently preparing a cutline around their fields, to construct a drift fence. Almost all fields are situated east of Chukumuchu.

From Chukumuchu the road is followed southwards, to Tjinipo molapo. From there the molapo is followed in an easterly direction for 13 km, to the first well of Toxamecha. From there

northwards, across Toxamecha lands and Matanga molapo to Kambu molapo. From there westwards to where it crosses the road to Mahorameno. From there to Bodum, along the road, from Bodum straight to the old well, 2.7 km. west of Chukumuchu. Following the road to the village, the point of commencement.

Livestock development area

The people want to keep cattle west of the settlement, in the valley which is presently used for their cattleposts. The grazing area begins at the old well, some 2.7 km west of the main village, from there in a straight line to Bodum (along a footpath). From there along the road to Mahorameno to Kambu molapo (5 km. north). Following this molapo west, until it intersects an imaginary line Xaree-Gunitsoqa. This line is followed to the south, Tjinipo molapo, from there eastward to the main road at Xabacha which is followed to Chukumuchu.

Wildlife utilization

This area is part of NG 1. The people from Chukumuchu are arable farmers proper, very few are hunting. In addition, most people immigrated very recently. Most hunting is done around Xabacha settlement, south-west of Chukumuchu village. They will be able to continue their traditional hunting activities.

Residential area

It is proposed to have the only residential area at Chukumuchu.

6.3.3 Development Issues

Infrastructure Development

The road to Chukumuchu needs upgrading. This would either mean a road via Tsodilo, or a new road which can be developed from the south, from Xara, Nxaunxau valley. For more detail on roads development: see Tsodilo (par. 6.4).

Arable farming

A Technical Assistant should be posted at Chukumuchu to assist the farmers in their farming activities.

6.4 Tsodilo Area Development Plan

The people at Tsodilo have expressed in the kgotla meeting with the Working Group WCRZ on 14/5/1992 that they are very much in favour of a land use plan for their village area (see also Chapter 6, consultations). This was expressed again during the meeting with the NMMAG, on 3/8/1992. At this same meeting other people expressed doubts on the issue of relocation of cattle. It was stressed that people want alternative watering points first,

because one of the elements will be the relocation of cattle to the grazing area. Details of the management plan have been discussed with the NMMAG on few occasions.

The land use plan as presented here was discussed with the Tsodilo community, with members from the Tawana Land Board present on 3/12/1992. The community agreed with all proposed plans.

6.4.1 Summary of issues

1. Social conflicts between BaMbukushu and Basarwa are abound.
2. Damage to historical sites causes serious concern. Damage is caused by visitors, but also some government departments (BDF) and livestock from Tsodilo residents.
3. Little income is gained locally out of tourism. People would like to establish a campsite and craftshop to increase their involvement in tourism.
4. People immigrate from elsewhere (Kajaja, Nxamasere), which increases pressure on the environment and the monument.
5. Integrity and naturalness of the site should be preserved.
6. Educational aspects of the monument should be developed.
7. Tsodilo has the highest number of registered destitutes (12 %), more than half of the households receive destitute feeding.
8. Outrageous prices are charged for basic groceries and tobacco, since there is no competition from a formal shop.

6.4.2 Land Use Zoning

The aim of the Development plan is to stimulate sustainable development, in a social, environmental and economical sense and to improve the infrastructure and the living standards of the people. This in line with the conservation of the monument. The village should not be a living museum but rather a living settlement.

Arable farming and gathering areas

The area immediately south and west of Tsodilo is zoned as the ploughing area for the village. Where the people presently plough, just east of the fossil lake, the soil is very marginally suitable; harvests might be better near the hill due to additional soil moisture from run-off from the rock. Some five kilometre west of the village (along the road to Chukumuchu) the soil is slightly better, classified as marginally suitable, and therefore this area might have most potential for future

expansion of fields. The site of the fields should be selected with care since the better soils are sparsely distributed in this area.

All around the hills important veldproducts are found; the fossil lake, east of the Hills, but also west of the hills. The resources here will be preserved with this zonation, gathering does not conflict with the conservation area and national monument.

Livestock development area

South of Tsodilo, from the molapo which is named Xomoxau (3.5 km. due south of the Kgotla) which runs in east-westerly direction, the area is zoned for grazing.

People are assisted in the development of their alternative water points. The NMMAG wants to dig a water point at some distance from the hills, to take the cattle away from the monument. It is proposed that two wells or boreholes are dug.

One well at Xomoxau (5.5 km. south-west from the Kgotla) is dry, and needs to be deepened.

It is proposed to dig the second well in the Kahimo molapo, 5.5 km. south-south west of the village or 8 km. east of Kahimo well. However, it is unknown if water will be found at these locations. It will prove to be difficult to stop further immigration of people from outside the area, especially when water will be provided by the Museum.

Some people initially expressed unwillingness to move to new sites since they claim they lack labour to herd cattle at cattleposts, away from the village (see minutes NMMAG, 8/92).

The people should be allowed to keep some draught animals at the lands, to a maximum number of 10 per water point. This only during the ploughing season or other times of need for draught animals or for transport.

Conservation area

The rock paintings at Tsodilo Hills themselves were proclaimed a national monument in 1951, protected under the National Monuments Acts (Cap.59:03).

The hills have a special vegetation type, which is considered rare in Botswana and needs further protection (Hannah et al, 1988; World Conservation Monitoring Centre, 1991; 1989).

The Hills and their surrounding area are proclaimed conservation area. The area includes relict of a fossil lake, which is located west of the village and measures some 10 km². Around the lake as well as the Hills there are several sites which require further archaeological research, and are in need of further protection.

The conservation area comprises all different land units around the hills, including the dunes and valleys.

At present the army is using the site for their operations and training. It is felt that this is not in line with the conservation of a monument of national importance, and the BDF should be requested to divert its attention elsewhere.

Forestry

The area around the hill receives total protection, and in due time it will have to be brought under the new forestry act as conserved area for its specific vegetation type of national importance.

The fierce veldfires often come from the north-east. There is a lot of damage to the modubana, due to fire (Vol.I, 3.9.2). It is recommended that the forestry management plan makes recommendations for construction of firebreaks, e.g. along the main road Samuchima-Tsodilo.

Firewood must be collected outside the conservation area. This will provide some work and income for residents, they can sell the firewood to visitors. Draft animals, sledges or donkey carts can be used for transport.

Hunting

The area around Tsodilo (the conservation area) is zoned as non-hunting, photographic area (NG 6). For boundary descriptions the reader is referred to chapter 4 or Appendix 2. No hunting will be allowed within a distance of 5 km. to the Hills. This is deemed necessary to avoid any risk of accidents with visitors but also to protect game in this area, to maintain further its natural character and increase the diversity.

Residential area

It is recommended that no power is exerted to move people from where they presently live. In line with the discussions held in August, people should only move if they want to, and they should be fairly compensated in that case.

Within the conservation area no further expansion of the village should take place. New residents are only allowed to settle at the southwesternmost settlement, south of the road to Chucumuchu (2 km. from the male hill). The residential area will extend as far as 2.5 km. up to the grove which was recently marked by NMMAG, in the triangle of the road to Chucumuchu, the southwesternmost settlement and the road from this settlement to the well. This area should be large enough to cater for all people, including the Basarwa if they are willing to move.

Any provision of facilities should take place here. If standpipes are going to be provided, water should be reticulated to this site.

It will be virtually impossible to stop immigration from elsewhere; this can only be achieved by cooperation with the residents and especially the headman.

6.4.3 Development Issues

The Tsodilo population is very small (110). It is not intended

to have a fast growing population, but increased employment opportunities will lead to some influx of people. Nevertheless, possibilities for provision of facilities will be low. But because of the isolated location, it is justified to have some services provided, but only the very basic ones like health, education and water.

Because of the objectives of protection of the monuments and tourism development the future production should be mainly linked to this, and agricultural development should be limited as far as it conflicts with these potentials.

Crafts Development

Advantage should be taken of the visitors that come to Tsodilo; Tsodilo is one of the few places where marketing of crafts poses less problems. It is most urgent that a retail shop is established at Tsodilo, as was also expressed by the people at Tsodilo. The Tsodilo sales outlet can also sell crafts made in other parts of Zone 6.

The establishment of a local craft shop should have the highest priority, especially if the National Museum will increase its tourism potential in the area. A local craft shop would be for retail of products, but can also be used as a training centre for producers and as a workshop where tourists can see the crafts people at work.

This craft shop can be linked to a marketing organisation in Maun which would market crafts from all over Zone 6. This organisation can be under the umbrella of the cooperatives, which could establish a consumers shop in Tsodilo.

Training programmes should focus on exchange of existing knowledge within the community. Secondly, diversification has to be looked into, based on local resources e.g. the timber found in the area. Presently very few chairs, axes or other wood crafts are offered for sale.

Industrial development

Industrial development is possible, but should have minimal impact on the monument and the tourism potential. Traditional industries like a black smith, bakery, carpentry, tannery is therefore permitted.

Other productive development

Presently there is nothing for sale at Tsodilo for visitors. Establishment of a shop should be encouraged, like a cooperative. The RADO has invited the cooperatives department to address the community.

Activities of the cooperatives can also include marketing of crafts.

Also drinks, postcards and other items can be sold at Tsodilo itself.

Roads and other infrastructure

The NMMAG is concerned about the uncontrolled access to the Hills. It is therefore proposed to divert the road, incoming from the north, around the eastern side of the Male Hill. All traffic either via the road from Thamacha or from Samuchima in the north, would arrive at the Museum itself.

For road development itself one is referred to chapter 5.

Possibly the airstrip should be relocated. The airstrip is in the centre of the conservation area and causes a lot of disturbance. People cross daily the airstrip to collect water.

Preferably the new airstrip should be located west of Tsodilo, along the road to Chukumuchu where the soils here are not too sandy. The soils more suitable for arable farming, slightly further north, should be avoided.

Education

There are no educational facilities at present. In DDP-4 there is provision for a Primary School under the RADP in 1993/1994. In view of the low population and the wish to keep the population low, it is advisable to change it and provide for a pre-school and/or private school only, catering for children up to standard 3 so that young pupils can attend school at their home settlement. Older pupils can easily be accommodated in other schools, like it is happening now.

Need for adult education should be assessed; courses can perhaps be combined with courses elsewhere.

Health

A permanent structure is being built for the mobile clinic visits from Etsha-6. It is not realistic at this stage to consider provision of a health post.

Water

There is provision for a second borehole under RADP according to DDP 4 in 1994/1995. The national museum has provision for water points as well (see above). At time of printing this report the museum drilled one borehole. Exact location was not known.

Tourism Development

-museum development

The National Museum has planned the construction of a museum at the Hills. Educational aspects and research aspects will be concentrated here.

The Museum has a preference for a site south-east of the male hill, on the sand ridge overlooking Tsodilo. This is thought to be a good site.

It should be noted though that nothing conclusive can be said about water development here. No water can be drawn from the village well, since the capacity will be too low, which would result in water shortages. Reticulation of water from a borehole

elsewhere will be difficult due to the height of the selected site.

The preparation of the lay-out and design of the buildings should commence as soon as possible. The design should take into account the environment and history of the place.

People from Tsodilo should be employed with the building activities as much as possible.

It is of utmost importance that a liaison person for the museum is appointed in Maun, to improve the poor communications with the different authorities and departments.

The possibility to develop a Trust consisting of representatives of the local community, the NMMAG and possibly other government departments, is investigated at the moment. The Task of the Trust would be the day to day management of the site, and to stimulate sustainable development. A system should be developed so that revenues from tourism benefit the local community. We must bare in mind that income opportunities for local people in the Western Communal Remote Zone are scarce and that any opportunity we can find should be used to improve the livelihood of the people.

-employment

Staff employed with the museum should be drawn from the local community as much as possible. Training should be provided to have at least few people from Tsodilo employed as caretaker or custodian at the museum.

This will ensure liaison between the local communities and the museum, on issues like the management of the site, and it will foster more understanding for the activities of NMMAG.

Secondly, it will prove to be difficult to have 'outsiders' more or less permanent posted at a remote place like Tsodilo. If they were to be found they will always be drawn to their places of origin.

Local people should be used as guides, and they should be trained in how to deal with tourists; some training on protection issues, value of paintings and information about the paintings, history, etc.

-camp sites

Residents of Tsodilo are eager to develop (a) camp site(s), where they can charge visitors that want to make use of the facilities. This is supported by the Ngamiland DLUPU for the following reasons:

- There are very little income earning opportunities at Tsodilo, and Tsodilo counts the highest number of destitutes dependant on government destitute relief (food hand-outs). The Working Group stresses that employment and income earning opportunities should be developed.
- A campsite would provide both communities an equal chance of earning some income, which might take away some social tensions.
- The people will increase their participation and care for the

monument, since they have direct benefits with proper management.

- People should have other financial income to show the alternatives for cattle rearing, and to compensate them for relocation of cattle

It is of utmost importance that the campsites are carefully selected, by the National Museum: at least two sites (one for each community), but preferably more. The planning unit would prefer some smaller sites near the Hills.

It should be looked into whether fencing of camp sites would be necessary.

A camp site can be under supervision of the community, which would be responsible for the cleaning of the site and maintenance of facilities.

Except for basic camp sites with fire places, water and long drop toilets, the community can also build some rondavels here, which tourists rent against a higher rate.

In addition, a larger campsite can be made for groups and overland trucks visiting the Hills. The capacity of such site should be at least some 15 tents. Such campsite must be located at some distance from the Hills.

Firewood can be sold to tourists. It is not permitted to collect firewood in the conservation area.

-site exploration

In line with the ideas from the museum, it is not allowed to decrease driving of vehicles around the Hills. The roads should therefore lead to the campsites at the Hill, and there they should be closed.

The monument can be explored by people on foot or with horses or donkeys. Several options should be offered, since it will be too hot at times of the year to walk much, neither is it for everybody to ride on horses. It should be possible therefore to use donkey carts, as was suggested by the museum.

The NMMAG could assist people with provision of the donkey carts, which people can pay back in due time.

Trails can be of different duration; from two hours, visiting the main rock paintings, up to a full day, exploring besides the rock art and archaeology also different aspects like geology, geomorphology, vegetation and fauna and birds.

It will demand some expertise to develop these trails and it will be a necessity to put up signs explaining various aspects of the monument.

In future also walking trails can be made covering 2 or more days. First it should be assessed though if there will be demand for such hikes.

6.5 NxauNxau Area Development Plan

The following plan is accepted for the area of Nxaunxau. Consultations were held on 12/5/1992. The people showed little confidence in Government in general, and had no interest in land use zoning.

6.5.1 Summary of Issues

- a. Land degradation is abound; one indicator, a problem grass is spreading rapidly in the area; the people are blaming the drought for land degradation.
- b. Borehole raises many complaints, people get sick from the water. Also health staff complain that the water is affecting their instruments.
- c. Presently there is no Veterinary Assistant or Technical Assistant (CP&F) based in NxauNxau.
- d. Land use system largely based on pastoral farming. Soils for ploughing are reasonable good, be it that there is a risk of soil erosion, and the nutrient status is low.
- e. NxauNxau is located outside the centre of this subregion. Chukumuchu is more centrally located and would therefore be more attractive as development centre
- f. Predation by wild dog and hyena is a very common problem

6.5.2 Land Use Zoning

Mixed farming areas

All areas around NxauNxau are zoned for mixed farming. The best soil for arable farming are found in the main river valley and its tributary.

Livestock area development, fencing allowed

The area west of the livestock trek route is zoned for grazing, where fencing will be permitted (see for allocation guidelines par. 7.1.2).

The area is separated into blocks, to avoid the blocking of wildlife migration corridors.

It should be noted that elephants are present in the area; most migration seems to take place from the Delta, Etsha area to Kaore, but tracks from elephants were also noted along the road to Qangwa, just south of the AI camp. Every potential applicant should be made aware of this fact, and that he can not claim any compensation for destruction of fences by elephants.

Arable farming and gathering areas

The ploughing areas are at Xabacha. People also keep some cattle here.

It is not allowed to expand wells further around in these lands areas; Xabacha is the ploughing area for the people staying here. This was their explicit wish, expressed after the consultation meeting. At NxauNxau it was stated that people from Xabacha should decide themselves if they wanted zoning of land.

Wildlife utilization

This area is in CHA NG 2, which is zoned for citizen hunting. This status still allows people to hunt with their special game licence.

Residential area

Residential area is at NxauNxau itself, as well as at Xabacha; all surrounding settlements are cattle post areas, which are not to be developed any further.

New for this area is that Xabacha falls under Chukumuchu and not under NxauNxau as it used to be (ch.5).

Chukumuchu is a RADs settlement, which presently does not cater for many Basarwa.

6.5.3 Development Issues

Livestock development

Predation of cattle by wildlife is a serious concern. DWNP has been informed of the situation, and, as mentioned in ch.4 they intend to make several changes in the compensation guidelines. One of the proposals made by the district is, that people can be paid a fixed amount for a certain animal (heifer, ox, calf). The procedure should be eased, with only a wildlife officer involved. Payments should be made in the district.

A veterinary assistant should be based at NxauNxau, since it is an important livestock rearing area.

In Xabacha livestock died because of a well with poisoned water. New well location should be identified and RADs should be assisted with new livestock.

Arable farming

RADs at Xabacha have applied for assistance for ploughing, they want lands, fencing material, implements, and draught power. It is strongly recommended that they get assistance under EPF and ALDEP; for this purpose the land applications they have made must be processed quickly.

Cenchrus ciliaris

This grass is very obnoxious, which was acknowledged by the people. It is proposed that government will assist with spraying of selected sites in the village, sites which should be kept clear of people and livestock. At present it is still unclear whether picking of the grass can be done under Drought Relief. The people showed however willingness to do it under self help.

Water Development

The development of a new borehole for this village has high priority. It should be attempted to establish a second borehole in 1994, instead of 1997/98, as it is presently planned.

6.6 Qooshe Area Development Plan

Consultations in Qooshe were held on 11/6/1992 (see appendix with consultations). A follow up was made, the area was visited again at 6/8/1992, when the water points were surveyed and the zoning was further discussed.

6.6.1 Summary of Issues

1. People complain about a conflict, cattle are grazing in the gathering and hunting areas.
2. Nobody ploughed for himself at Qooshe, some ploughed for others that own lands here; reason is apparently lack of seeds and ploughs.
3. No FAP projects have been started at Qooshe.
4. Despite the fact that Qooshe is a very small settlement (59 people), it has its own water supply
5. People want assistance which was promised to develop a well at Nxwienxoro. Here they can keep EPF cattle

6.6.2 Land Use Zoning

Arable farming and gathering area

The lands are concentrated in the valley at Qooshe. The soils are marginally suitable, which is about the best qualification in this area. Similar soils are found in Malatso molapo, south of Qooshe.

Most veldfoods are gathered south of Qooshe, in Malatso (or Qodugum) molapo; grasses are found east of Qooshe, few kilometres from the village near Benxaa molapo.

The area in the triangle around Qooshe is zoned as the ploughing and gathering area for Qooshe.

The rough boundary is as follows: from the bridge at Mahito due north, to Xunsus molapo (Mathata a mathlalerwa), following this molapo to the point north of Karuwe, from there due south, across Karuwe to Malatso molapo. Following this molapo to Qooshe, from there along the road to the bridge.

Livestock development area

The grazing area is north of Qooshe, at Nxwienxoro, as well as to the east, from the bridge up to Mahito and further. See further for the ploughing areas what area is excluded from grazing.

Livestock development area, fencing allowed

The area west of the livestock trek route is zoned for grazing, where fencing will be permitted (see for guidelines par. 7.1.2). The area is separated into blocks, to avoid the blocking of wildlife migration corridors.

It should be noted that elephants are present in the area; most migration seems to take place from the Delta, Etsha area to Kaore, but tracks from elephants were also noted along the road to Qangwa, just south of the AI camp. Every potential applicant should be made aware of this fact, he can not claim any compensation for destruction of fences by elephants.

Wildlife utilization

This area is in the centre of CHA NG 3, which is zoned for community wildlife utilization.

Residential areas

The only residential area is at Qooshe itself; the residential area is north of the main road, in between where the track from and to the main road goes.

6.6.3 Development Issues

Livestock development

It is proposed that RADs from Qooshe are assisted in the development of a water point. This water point should be at least 8 km. from Nxwienxoro, where Ipopagano syndicate has been allocated. It is proposed to select a site 8 km to the west, since it might be too far from the settlement otherwise.

The cattle which are presently watered in the village should preferably be moved away, to avoid crop damage. This can only be done through the community. People can be assisted though to move out of the village with their cattle through the Water Development Scheme; it might be difficult though to find water elsewhere.

The cattle trek route will be extended very soon, up to Dobe. At

present preparations are being made by the Veterinary Department and Office of the President. This will improve the marketing of cattle considerably.

Crafts Development

Crafts are important for Qooshe, since it is a main source for cash income. With stimulation of crafts developments at Qangwa, the crafts at Qooshe will also be boosted. A marketing outlet at Qangwa will in this respect be important for Qooshe.

Roads and other infrastructure

It is of utmost important for this subregion that the road from Nokaneng is upgraded to all-weather standard. This should have priority for council, since a large number of people are living here and access is one of the crucial factors in development here.

6.7 Qangwa Area Development Plan

Consultations in Qangwa were held on 9/6/1992 (see appendix with consultations). The people showed little confidence in Government in general, and had no interest in land use zoning. Development issues were discussed with the Councillor for the area.

6.7.1 Summary of Issues

1. Land degradation is abound; a problem grass is spreading rapidly in the area (*Cenchrus ciliaris*); the springs are polluted. The people are blaming the drought for land degradation, and they show little interest to do something about the problems.
2. People want a craft shop where crafts can be stored, which can also serve as central marketing point.
3. People want assistance for borehole drilling, since Qangwa area is too much congested with cattle.
4. Extension of the trek route is wanted and needed, to improve the marketing of cattle.
5. RADP has committed itself to assist people from Cherachera-cha with the development of a water point, for their (EPF) cattle.

6.7.2 Land Use Zoning

Mixed farming areas

All areas around Qangwa are zoned for mixed farming. The best soil for arable farming are found where the cattle is grazing. The springs in Qangwa provide in natural water points over a short distance, which has resulted in pollution and land degradation.

It is recommended that the people at Cheracheracha are assisted in development of a water point. They have dug a well with their own sources, the well is deep, but no water was found.

Wildlife utilization

This area is in CHA NG 3, which is zoned for community wildlife utilization.

Residential area

Residential area is at Qangwa itself; all surrounding settlements are cattle post areas, which should not be developed any further.

6.7.3 Development Issues

Crafts Development

With stimulation of crafts developments at Qangwa, the crafts at Qooshe and areas like Magopa will also be boosted. A marketing outlet for crafts at Qangwa will in this respect benefit the whole region.

Livestock development

The livestock marketing is the only thing that can be improved to alleviate the land degradation. At present a trek route is constructed to facilitate BaHerero to repatriate to Namibia with their cattle. For this purpose a holding ground is constructed at Dobe. The boreholes that are drilled for the trek route link this subregion with the major markets.

It is recommended that people from Cheracheracha are assisted with the deepening of the well or the drilling of a borehole. Their present well is 20 m. deep, all dug by own means which were finally exhausted.

Once the well is established it should be assessed whether they can be assisted with cattle under EPF.

Roads and other infrastructure

It is of utmost important for this subregion that the road from Nokaneng to Qangwa is upgraded to all-weather standard. This should have priority for council, since a large number of people are living here and access is one of the crucial factors in development here.

6.8 Dobe Area Development Plan

The plan for Dobe area is based on the consultations with the people at 10/6/1992.

6.8.1 Summary of Issues

1. Education is poorly attended by children from Dobe.
2. Marketing of handicrafts has stopped.
3. To water their EPF cattle, people want a water point of their own.
4. Arable farming is constrained by lack of implements and poor soils.
5. The settlement is very near to the Namibian border (2-3 km.).

6.8.2 Land Use Zoning

Arable farming and gathering areas

By virtue of the fact that the fence at the border is built as a stock and disease control fence, (see Daily News, d.d. 9/9/1992) it is not permitted to establish boreholes for livestock within 4 km. from the fence at the Namibian border. Nor is it permitted to establish kraals within 4 km. of the border (see guidelines, chapter 4).

All land west of the old cutline Cheracheracha-Qabi (which is appr. 6 to 8 km. from the border) is zoned therefore for ploughing and gathering purposes. As mentioned on p. 16, Vol.I, the soils are marginally suitable due to shallow soils which give limited roothold. Occasionally water logging occurs.

Grazing area

The grazing area is east of the cutline/road. from Cheracheracha-Qabi.

Along the Namibian border a holding ground for livestock of the Baherero repatriating to Namibia has been established.

South of Dobe is Qubi cattlepost. This area is traditional summer grazing area with many pans holding water after the rains. In addition, in this area there are several protected archaeological sites, which includes Xgi, the most important Middle Stone Age site in Botswana.

Hunting area

This area is zoned as NG 3, for community wildlife utilization.

Conservation area

Aha Hills, the area south of the cutline at Qabi (which runs due

west) is zoned as a conservation area. No expansion of grazing shall be allowed within this area, due to the uniqueness of the area, the archaeological sites and the presence of the national monuments.

In addition, it is near the border fence from which also within 4 km. no boreholes can be established.

Residential areas

The only residential area is Dobe. Because of the small number of people living here possibilities for provision of facilities will be low. It is justified to have some services provided, but only the very basic ones like health, education and water.

6.8.3 Development Issues

Livestock development

It is proposed that people from Cheracheracha and Qainxaho (both north of Dobe) are assisted with EPF cattle and the establishment of a water point.

They do have old water rights at those sites. At Cheracheracha an attempt was made to dig a well, over 20 m. deep. This was done with own resources until these were finished.

6.9 XaiXai Area Development Plan

The plan for the area of XaiXai is based on ample consultations with the community of XaiXai, see also consultations by the Working Group Zone 6 at the kgotla (8/6/1992), meeting of the LUO with the VDC (7/8/1992) and kgotla meeting addressed by people from NRMP (DWNP), DOL and LUO (16/10/1992). The area was visited once more 23/11/1992, in which brief discussions were held with the chief and few VDC members.

Finally the plan was presented to the community on 4/12/1992, in presence of the Members of the Tawana Land Board. The community agreed with the plan and expressed the wish to develop a project based on natural resources, esp. wildlife.

6.9.1 Summary of Issues

1. Soils are not good for ploughing at XaiXai itself. In addition, cattle destroy crops at the village. For this reason Nxani is assigned ploughing area. A well for human consumption should be established near the fields.
If found necessary a drift fence can be constructed between the village and the fields. This to prevent crop damage by livestock.
2. The area has an important tourism potential (Qwihaba Caves, Aha Hills).
3. Wildlife resources have a major potential for income and

employment generation.

4. The Aha Hills and Qwihaba Caves are in need of protection for their important vegetation type as well as the presence of national monuments and archaeological finds at these sites.
5. A large number of people is dependant on hunting and gathering, which is also shown by the large number of special game licences.
6. Livestock development is hampered by the very limited water resources and bad marketing situation
7. The RADP has committed itself to assist the people with the digging of a well at Qwihaba and Nxani; the wells can not be deepened due to calcrete, assistance is needed from a blaster.

6.9.2 Land use zoning

Arable farming and gathering

Nxani valley is zoned for arable farming. This area has marginally suitable soils (S3m and S3m), the best rated soils in this sub-zone.

No cattleposts are to be established in this valley; wells established can only be for domestic purposes or draught animals only.

Land Board and RADP is requested to address the people at Xaixai on land registration, and should enable/assist people in the application at Nxani. (Only few people cleared lands at Nxani some years back, not known is whether these were registered). The Ministry of Agriculture then could assist the people in their applications for implements, draught power or fencing materials.

Seed distribution should be improved since presently no A/D is based at Xaixai. Under the present drought the seeds will be distributed by Field Assistants.

After this programme will be finished it is proposed to assist the villagers through the development worker within the village (see below).

Livestock development area

The valley east of Xaixai (up to the turn off to Xhaba cattle post) is zoned for livestock grazing. This is the area presently used for grazing, be it mainly seasonal since no permanent water sources are present here. The carrying capacity is presently good, in this area; in 1990 the estimated c.c. was 10 ha/lisu. With the present demand for grazing (6,500 ha) the area provides ample space for all cattle, but new wells or boreholes should be established further east to facilitate a better distribution of livestock.

It should be noted though that no information is available on presence of good aquifers in this same area, since no boreholes

were ever drilled here.

It is recommended to assist farmers which have their watering point at the cluster of wells at Xaixai and Engonde to relocate their watering point further east, in the grazing area. This could be done with the Water Development Scheme from MoA.

It is strongly recommended to secure funding for the drilling of a borehole for the trek route, so that farmers are able to sell their cattle to BMC. The borehole should be sited near the turn off to Xhaba cattlepost.

RADP should continue to provide support to RADs with breeding heifers under EPF. However, wells need to be developed at appropriate sites, and the sites identified (Qwihaba and Nxani) conflict with other land uses. It is recommended that no cattle will be allowed at Qwihaba, (see explanation below under tourism development). At Nxani the well could be used for draught animals only, it should not be a cattle post and therefore a limitation on number of cattle is proposed of 50 head. It might well be possible though to establish a second watering point at Nxani or in Qwihaba valley (west of where the Qwidum valley joins Qwihabadum). Also further south in Qumxhani this would not cause conflicts.

Conservation area

Both, Qwihaba and Aha Hills are conservation area. The vegetation type of Aha Hills (rocky hill habitat) is rare and presently in Botswana unprotected. Some rare geological features like the Caves and sinkholes require adequate protection as well (World Conservation Monitoring Centre 1991; Hannah et al 1988; IUCN, 1987).

The conserved area comprises 8 km. on either side of the Xaixai/Qwihaba valley, from Xhomo pan, (appr. 10 km. after the turn-off to Qwihaba), up to Xhaba cattle post.

The second conservation area comprises the Aha Hills; it is enclosed by the International border in the west, the outline which is the boundary of NG 4 in the north, the road Magopa-Xaixai in the east, the road from Xaixai to the border in the south.

Tourism/Wildlife utilization

It is recommended that the area south and west of Xaixai, NG 4, is zoned as wildlife management area.

It is proposed that the WMA is subzoned, as conservation (non-hunting) area and hunting area. The conservation area has a good potential for photographic tourism but also other traditional land uses like gathering are important here.

Hunting should be done south of Xaixai, or north-east of the village in the grazing area. Far south around Koanaka a diversity of game species is found, including many gemsbok, wildebeest, and

kudu. Also hartebeest, eland, giraffe, leopard and lion are present here.

In all, also this area represents a good hunting potential, also for commercial hunting.

6.9.3 Development Issues

Protection of conserved areas

Until recently, there were three known caves in the western Ngamiland region, Qwihaba Caves (a.k.a. Drotsky's) and two deep sinkholes in the Aha Hills (Waxhu North, Waxhu South). The former has two large central chamber and approximately 1 km of passage. Because the cave has been open to the surface for a considerable time, large amount of sand and bat guano have infilled much of the system. Recent research has led to the discovery of three new caves in the region. One located in the Qwihaba Valley (!Wa-Doum Cave) has a small and cryptic entrance which has effectively sealed the system from the external environment. This has excluded bats and much of the sand resulting in unique internal conditions. The cave has a very high density and diversity of secondary formations, many of which are rare and very beautiful. It also appears to continue into deep, lower levels which probably contact groundwater. The cave also has an unusual dynamic, carbon-dioxide enriched lower atmosphere, probably related to the ground water. This creates a hazardous situation for visitors. The cave has been sealed with a steel and concrete gate to preserve the internal environment and control access. Two other caves were discovered in the Koanaka Hills. One of these is located in a hill that was known to contain fossil cave sediments dating from the Plio-Pleistocene (2-3 Million years ago-see research by M. Pickford). The cave consists of a single 75m wide chamber, several peripheral rooms and an entrance series of chambers. The second cave, Blue Cave, is located in a nearby hill and is unique in that the internal dolomite rock walls are blue. With 1800m of surveyed passage and 35m high chambers, it is the largest known cave in Botswana. Both Koanaka caves contain fossil remains of large mammals at least 2 million years old. Such represent an unusual and extremely valuable scientific and natural resource that must be carefully protected. There is also evidence that the caves were used by species of hominids which were ancestors to modern humans. Provided the problems of conservation and safety to visitors are properly addressed, these caves can also become an important tourist resource. In order to protect the integrity and value of these caves, it is essential that NMMAG liases closely with the Natural Resources Management Project in XaiXai. In this way local communities will be able to profit from tourism and protection of the caves will be ensured.

For now it is proposed that a caretaker is posted near the Caves; the caretaker should act as guide, and see to it that no further vandalism takes place. The caretaker should charge a standard rate for his service, which should pay for his salary.

It is not permitted to collect firewood in this conservation area due to lack of firewood. Villagers could collect firewood and the caretaker can sell it to visitors.

Tourism development

It is recommended that a community based natural resources management project is started, after the community has given its final consent on the concept (see par. 7.4.4).

Tourism development would create much needed employment. An integrated project, involving both safari hunting and photographic tourism, seems to be the most preferred option of the villagers.

Horse riding can be offered at the Aha Hills. A camp can be constructed here, as well as ablution facilities. Horses can be rented from the village for a fixed price, which will bring in revenues from the start of the project.

Interesting part would be the vegetation of the Hills, birds, but also wildlife; at times of the year elephant are present in the Hills (tracks of a herd of some 25 elephants were sited in November 1992), but also leopard will be present.

A trip would be offered to the Qwihaba Caves. Also here walks could be organised. A camp site should be established here, which would be maintained by the village. This would form a permanent source of income for the village.

For a safari company, the hunting would bring in most revenues, the hunting would pay for the (high) investments in photographic tourism (camp construction, cleaning of the area, drilling of (a) borehole(s)). Trackers would be employed from the village. People would be trained to be professional skinners, and meat would still be returned to the community. People would be employed at the camp.

A focal part would be also the interaction with the people from Xaixai. A view of village life in an unspoilt area, with old traditions still present; hunting, livestock rearing; culture, crafts development.

Before further steps are taken a project memorandum should be prepared, in discussion with the people, with NGOs and/or donor agencies, and possibly with interested safari companies. Especially the responsibilities of the different parties and the formal relations should be worked out in detail. The management of such a project are crucial for success of such a project.

6.10 Groot Laagte Development Plan

Since no settlements are present in Groot Laagte area no formal consultation took place. Some discussions were held with individuals though, from Kareng as well as from Botshelong. The

area was visited on several occasions, to record water points in the area.

The land has best potential for wildlife utilization, since the water resources are very poor, which would be a major constraint for pastoral farming.

The residents of XaiXai were very much in favour to zone the northern part of the area (NG 4) as WMA. The southern part (NG 5) has even more game and has a good potential for hunting. The resources for other land uses like pastoral and arable farming are very limited.

Very relevant was a conversation held with Mr. Segadimo, the councillor for Kareng, d.d. 25/11/1992, in presence of PRADO and Mr. Mangana:

"Land should be allocated to the RADs from Kareng. Also for people from Kuke quarantine camp. They are a burden for Kareng. They should get land west of Kareng, in the area of Botshelong and north of the Kuke fence.

The people must have wildlife, land for ploughing and to graze some cattle. A wildlife area as the people from XaiXai want will be a good thing. The people from XaiXai and RADs from Kareng are the same.

RADs need land urgently, it is not good that all land is taken by others. This should be stopped, even people from Kareng recognize that.

The land should be allocated by the Land Board to the RADs, the land comes first, if people have land we can find resources to develop it."

6.10.1 Summary of Issues

1. Groot Laagte area has a good wildlife potential, with a lot of gemsbok present, but also a high number of eland (an estimated 700).
2. Water potential is very poor; except for one borehole which is not operational (and saline) and two others drilled recently no other cattleposts are present.
3. Land pressure is prevalent in the east of the area (Kareng area); people have no rights, squatter at existing boreholes
4. Much pressure exists in the east to fence off lands

6.10.2 Land Use Zoning

Wildlife Management Area

The area is zoned as Wildlife Management Area. Other land uses are allowed, as long as it is compatible with this zoning, arable farming and (limited) pastoral farming.

Presently there is only one field near Botshelong, otherwise no

farmers are ploughing.

Livestock development area

Many constraints are imposed on livestock development (see above). For that reason main emphasis is on wildlife utilization and other land uses should be compatible with it. Existing water points can be developed (as far as possible) but no new water points can be allocated for intensive livestock rearing.

Only non-intensive livestock rearing should be permitted, i.e. livestock for domestic purposes only (this includes ploughing and for milk).

A maximum number of livestock per watering point is imposed therefore, being 50 head of cattle per watering point.

Arable farming

Arable farming has not much potential in this area. Since the scale of farming is not conflicting with the main form of land use, it is allowed to establish fields.

Tourism/Wildlife utilization

It is proposed that the southern part of the area (NG 5), will be allocated to a community. See for details on settlement the development plan for Groot Laagte.

This southern area has also many interesting desert species, game of interest for the safari industry. Especially since the hunting is closed in the southern parts of the country.

If the community wants they can invite a safari company for trophy hunting in this area. The communities would decide on what licences are sold, and they should be recipients of the revenues for these licences.

Meat should be returned to the communities. Residents should be employed as much as possible.

Forestry

No real potential for forestry exists.

Residential area

Presently no people are living in this area; it is proposed to resettle people from the area of South-west Ngami, as a scheme from RADs unit. This would take away the pressure from that area, since it is overcrowded with people squatting at boreholes.

Some RADs have been allocated water points in the west already, where they intend to settle (see chapter 2 and 8). They can be assisted with drilling of boreholes, by either RADs unit or an interested NGO like BCC.

6.10.3 Development Issues

Infrastructure development

No further infrastructure is to be provided. A development centre should be outside the area, at a new centre or at a settlement like Kareng.

CHAPTER 7: Further Research

7.1 Livestock

Mineral deficiencies are a concern in general in livestock rearing. Very little is known to what extent the deficiencies are found in different land units. For that reason it is proposed to have blood samples taken from cattle which are brought to BMC, and assess the levels of different minerals and the deficiencies. It is possible to assess this fairly reliable (SVO, pers. comm.).

7.2 Forestry

Reference is made to the various chapters in which remarks are made on specific forestry issues.

Attention should be paid to the regeneration of Mukwa; it seems that in that respect the situation here is better than in Chobe Forest reserves. Ecological factors might be of major importance in this respect.

7.3 Vegetation monitoring

Monitoring of vegetation is needed; especially in those areas where ranching will be undertaken. Before the ranches will actually be established, transects should be set out, to monitor the vegetation changes. Especially increase in woody species and decrease in perennial grasses are of importance.

A monitoring system is needed to assess the effects of grazing/vegetation change on groundwater.

7.4 Vegetation Research

A detailed vegetation survey of Aha Hills and Tsodilo Hills is needed. The areas are proposed as conservation areas, partly based on the rare vegetation type; up to now no comprehensive study was done of the plant species and occurrence of endemic species. Some sampling has been done in the past by P. Smith.

7.5 Veldproducts

Further research is needed into the presence of morama bean, and the potential for commercial harvesting of the beans. Further on it should be evaluated if it is possible to develop commercial utilization of veldfoods (from a natural as well as a commercial point of view). Monitoring of possible depletion of the various veldfoods should take place.

More awareness should be built on the utilization of veldproducts. Up till now government as well as private sector do not acknowledge the importance of veldproducts for the local communities (see Vol. I).

The Forestry Programme for Botswana (Ngamiland project) should take a leading role in this exercise.

7.6 Beekeeping

More research should be done in the ways that people harvest honey, and how sustainable the used techniques are.

7.7 Wildlife/Natural Resources Utilization Project

A study should be undertaken to check the possibility to start a same kind of project in Groot Laagte as in XaiXai. More precise wildlife data of NG 4 and NG 5 are needed.

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**APPENDIX 1: Previous and present members of the Working Group
Western Communal Remote Zone and supporting officers**

Function and name of previous and present members of the Working Group Western Communal Remote Zone including supporting officers. Order of appearance is random (as was found in the minutes of the WG-WCRZ).

Bussiness Advisor RADs	O. Nelson
Council Planning Officer	R. Dimbundu (chairperson)
Land Use Officer	T. van der Sluis (secretary)
Senior RAD Officer	W. Machao
RAD Officer	V. Morris (act. chairperson)
District Officer Lands	E. Naane
Senior Council Planning Officer	K. Morakanjane
District Officer Lands	W. Chabo
District Officer Development	W. Smit Lenders
Bussiness Advisor RADs	I. HOGset
District Officer Lands	T. Rampa
District Officer Development	M. Roozendaal
Principal RAD Officer	J. Camm
District Agricultural Officer	F. Sigwele
Administrative Officer	S. Seoke
Dep. Wildlife Nat. Parcs	S. Masabase
Sub-Land Board	T. Thomas
Dep. Water Affairs	O. Balapi
TSP	E. Monametsi
District Officer Lands	I. Tema
District Agricultural Officer	K. Setswalo
Land Use Officer	M. Boom (secretary)
Council Planning Officer	E. Kealotswe
Council Planning Officer	Xu Yao
Ass. Project Officer	Tshao
Ass. Project Officer	Monkgwe
Ass. Project Officer	Morwagabuse
Forest Officer	K. Mathibidi
Remote Area Dweller Officer	Makabu
Senior Livestock Officer	Habano
District Agricultural Officer	Ncube

APPENDIX 2: LAND EVALUATION

Rating of land qualities

The influence of each land quality on land use is determined by a single (or a set of) land characteristic(s), according to the grade of its availability or absence of risk, as follows:

<u>Rating</u>	<u>Description</u>
1	very high grade of -availability/-absence of risk
2	high " " "
3	medium " " "
4	low " " "
5	very low " " "

Generally the most limiting factor is conclusive; exceptions to this rule are explained in the text. The grades have a relative meaning only; i.e. the approach is qualitative.

forage availability

The forage availability has a quantitative and qualitative component:

- quantity/unit area (carrying capacity)
 - quality: digestability, palatability, toxicity, nutrient value
 - crude & digestable protein
 - minerals (micro- and macro nutrients)
- yearly and seasonal variation

It is not possible with the present knowledge to define accurately differences in fodder quality, based on vegetation type. The detail on the vegetation is lacking, but also scientific information on e.g. crude protein for different browse is not available.

However, the range assessment takes into account the quality of the species. Therefore it is mainly the actual carrying capacity, based on the data of Range Ecology Section (see Vol. 1) which is used for the assessment, as well as the mineral deficiency.

The potential carrying capacity in most of zone 6 is 14 ha/lsu (Field, 1973) and this is used as an indicator for 'average' grazing conditions. Secondly, the areas with a low carrying capacities are ecologically most fragile and least suitable for grazing.

subrating carrying capacity

- | | |
|---|--------------|
| 1 | < 12 ha/lsu |
| 2 | 12-14 ha/lsu |
| 3 | 14-16 ha/lsu |
| 4 | > 16 ha/lsu |

The carrying capacity will be affected by the annual rainfall. Most important to consider is what the average rainfall is. For perennial grasses and shrubs that will be browsed, the dry spells and reliability of rainfall are less of importance.

factor of any subratings. If, for example the subrating is 1 and 5 respectively, the final rating will be 5. The significance of the figures on the scale of 1 to 5 is as follows: 1 means excellently accessible, 5 means accessible with great difficulty.

location (mainly req. markets)

Marketing of cattle is finally the aim if one strives for optimal land use. Marketing is considered a real problem where there is no cattle trek route, and large distances to bridge when going to the abattoir; it hampers timely marketing since cattle can only be trekked during the rainy season.

The distance to major villages is also of importance for supply of materials or access to extension support, LAC etcetera.

subrating marketing

- 1 near the cattle trek route; access to loading ramps
- 2 access to feeder trek route
- 3 no trek route present; water points present to reach the trek route
- 4 no trek route; no water points present, marketing in dry season impossible

Current suitability for pastoralism

Land Quality	HpH	HmL	SmH	SmA	SpH	SpA	SpL	Apa	ApL
<u>Forage availability:</u>									
Carrying capacity	4	4	2	4	2	2	4	2	2
Average rainfall	1	3	1	2	1	2	3	2	3
Risk veldfires	3	3	3	3	3	3	3	3	3
<u>Forage quality:</u>									
- Minerals	3	3	3	3	3	3	3	3	3
overall rating	4	4	3	4	3	3	5	3	4
<u>Water:</u>									
Water availability	4	4	4	4	5	5	5	5	5
Water quality (TDS)	2	1	2	2	4	3	4	5	5
Surface water present	2	3	3	1	3	3	1	2	2
overall rating	4	4	4	3	5	4	4	5	5
<u>Biological Hazards:</u>									
Poisonous plants	1	1	3	3	3	3	3	3	3
Predation	2	3	2	5	2	5	3	3	3
overall rating	2	3	3	5	3	5	3	3	3
<u>Accessibility:</u>									
Slope	1	4	1	1	1	1	1	1	1
Stoniness	1	3	1	1	1	1	1	1	1
overall rating	1	4	1	1	1	1	1	1	1
<u>Location:</u>									
Distance to markets or major town	4	4	1	2	1	4	4	4	4

Overall rating into land suitabilities is as follows:

Forage availability	Water	Biological hazards	Accessibility	Location	Overall Rating
1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	S3
4	4	4	4	4	S4
5	5	5	-	-	N2

Current Suitability for pastoralism	HpH	HmL	SmH	SmA	SpH	SpA	SpL	Apa	ApL
Rating	S4	S4	S4	N1	N2	N2	N2	N2	N2

- S3 = Marginally suitable
 S4 = Very marginally suitable
 N1 = Temporarily unsuitable
 N2 = Permanently unsuitable

Potential Land Suitability for pastoral farming/ranching

If we want to evaluate the land for its potential suitability, the rating of few factors will change, and few other factors should be added: water potential, potential carrying capacity, mogau and ease of fencing. Only those ones that are changed or added are included here. The rest will be rated as above.

Forage availability

It is assumed that the carrying capacity will increase in some areas, after the range recovers from overgrazing and mismanagement.

Average carrying capacity is considered to be rather low, compared to carrying capacities elsewhere in Botswana. The weighing of the land units for the potential land suitability for pastoral farming will therefore be based on potential carrying capacity (Field 1973).

subrating	carrying capacity
1	< 12 ha/lsu
2	12-14 ha/lsu
3	14-16 ha/lsu
4	> 16 ha/lsu

Water:

If no established water points are present, it has to be assessed what chance there is of finding suitable water. The costs for establishment of a water point are very high and the risks are large, for that reason the rating starts at 3. The rating is derived from hydrogeological maps (GSD, 1981) with extrapolation from knowledge of existing water points.

subrating	water potential
3	uniform fair
4	variable poor to fair
5	uniform poor

Mogau

In the case of land evaluation for fencing the rating should

increase with one point, since mogau might pose severe limitations on intensive grazing management. Under grazing pressure mogau will increase rapidly, it might expand into areas which are presently not really infested.

subrating	Presence Mogau
1	absent
2	
3	
4	occasionally/common
5	widespread

ease of fencing

Ease of fencing of land is of importance if one considers ranching, through fencing of communal lands, as proposed in the new agricultural policy.

Presence of elephants will be a major problem if one considers large scale fences.

subrating	risk of destruction
1	no risk
2	elephants rarely visit area
3	elephants visit occasionally the area
4	elephants migrate annually through area

Accessibility is important if one considers fencing of land, especially the rockiness of the soil and slope. The rating for accessibility is determined by the most limiting factor of any of these subratings. If, for example the subrating is 1 and 5 respectively, the final rating will be 5.

subrating accessibility
as above (p. 6)

Potential suitability for pastoralism (per land unit)

Land Quality	HpH	HmL	SmH	SmA	SpH	SpA	SpL	Apa	ApL
<u>Forage availability:</u>									
Carrying capacity	4	4	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Average rainfall	1	3	1	2	1	2	3	2	3
Risk veldfires	3	3	3	3	3	3	3	3	3
<u>Forage quality:</u>									
- Minerals	3	3	3	3	3	3	3	3	3
overall rating	4	4	3	3.5	3	3.5	4	3.5	4
<u>Water:</u>									
Water potential	4	4	4	4	5	5	5	5	5
Water quality (TDS)	2	1	2	2	4	3	4	5	5
Surface water present	2	3	3	1	3	3	1	2	2
overall rating	4	4	4	4	5	5	5	5	5
<u>Biological Hazards:</u>									
Poisonous plants	1	1	4	4	3	4	3	3	3
Predation	2	3	2	5	2	5	3	3	3
overall rating	2	3	4	5	3	5	3	3	3
<u>Accessibility:</u>									
Slope	1	4	1	1	1	1	1	1	1
Stoniness	1	3	1	1	1	1	1	1	1
overall rating	1	4	1	1	1	1	1	1	1
<u>Constraints fencing:</u>									
Presence elephants	3	4	4	4	4	3	2	1	1
Accessibility	1	4	1	1	1	1	1	1	1
overall rating	3	4	4	4	4	3	2	1	1
<u>Location:</u>									
Distance to markets or town	4	4	1	2	1	4	4	4	4

Overall rating:

Forage availability	Water	Biological Hazards	Accessibility	Location	Overall rating
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1,2,3	1,2,3	1,2,3	1,2,3	1,2,3	S3
4	4	4	4	4	S4
5	5	5	-	-	N2

Potential Suitability for pastoralism ^{*)}	HpH	HmL	SmH	SmA	SpH	SpA	SpL	Apa	ApL
Rating	S4	S4	S4	N1	N2	N2	N2	N2	N2

(*) Note that ease of fencing was not weighed for this assessment)

Potential Suitability for ranching	HpH	HmL	SmH	SmA	SpH	SpA	SpL	Apa	ApL
Rating	S4	N2	S4	N1	N2	N2	N2	N2	N2

S3 = Marginally suitable
 S4 = Very marginally suitable
 N1 = Temporarily unsuitable
 N2 = Permanently unsuitable

However, the socio-economic chapter has shown the importance of the combination of different activities in Zone 6, or the 'multi-stranded' economy (IUCN, 1992). This is in contrast with land qualities and aspirations of the population.

Hunting is often a multiple Land Utilization Type on agricultural, forestry or livestock rangeland.

APPENDIX 3: BOUNDARY DESCRIPTIONS CONTROLLED HUNTING AREAS

A general description of the boundaries is given in par.4.5.2. This appendix gives the detailed boundary descriptions, which will be gazetted for legal status in 1994.

Controlled Hunting Area NG/1 (Xaudum)

Commencing at a point marked NG/1/7/A (app. coord.34E5755N79803) being a point at the International Boundary of Botswana with Namibia at boundary beacon BP 18-19/10, the boundary follows the International Boundary with Namibia WSW, (258°), to a point marked NG/1/A (app. coord.34E5479N79749) being a point at the International Boundary of Botswana with Namibia at boundary beacon BPP 147, the boundary follows the International Boundary with Namibia due west, (270°), to a point marked NG/1/B (app. coord.34E4999N79750) at boundary beacon BP 18-19/1; thence in a straight line southwards (180°), to a point marked NG/1/2/A (app. coord.34E4999N79268), being in the centre of a molapo, appr. 1 km. south of boundary beacon BP 21/4; thence following the centre of the molapo in easterly direction (100°) to a point marked NG/1/2/B (app. coord.34E5233N79227), where the valley enters a river valley running NNW-SSE; thence in a straight line (98°) to NG1/2/C (app. coord.34E5300N79237) being the location of the well at Xabacha; thence following the main road to point marked NG/1/2/D (app. coord.34E5423N79233), being the centre of a molapo at Tjinipo cattlepost; thence following the centre of the molapo in easterly direction (100°) to a point marked NG/1/2/E (app. coord.34E5548N79212) being the first well at Tuxamecha cattlepost, thence in a straight line NNW (21°) to a point marked NG/1/2/F (app. coord.34E5573N79278) being a point just north of Tuxamecha lands, at the intersection of the road Tsodilo-Chucumuchu; thence the road is followed in ESE direction (106°) up to a point marked NG/1/2/6/A (app. coord.34E5725N79239) being a point appr. 6 km. from the kgotla of Tsodilo; thence in a straight line NNW (340°) to a point marked NG/1/6/A (app. coord. 34E5694N79327) being a point in a valley just west of a thick bush; thence in a straight line almost north (9°) to a point marked NG/1/6/B (app. coord.34E5700N79369) being a point at a group of trees; thence in a straight line ENE (60°) to a point marked NG/1/6/C (app. coord.34E5740N79392) being a point on the north side of a larger group of trees; thence in a straight line ESE (112°) to a point marked NG/1/6/D (app. coord. 34E5784N79376) being a small bush; thence in a straight line SSE (143°) to a point marked NG/1/6/E (app. coord. 34E5826N79323) being a point at the intersection of the cutline/road Tsodilo-Samuchima; thence in a straight line SSE (166°) to a point marked NG/1/2/6/B (app. coord. 34E5853N79212) being a point at the intersection of the road Tsodilo-Thamacha; thence the road is followed almost due east towards Thamacha up to a point marked NG/1/2/7 (app. coord. 34E5983N79212) being the centre of the cattle trek route; thence the trek route is followed in a straight line in NNW direction (332°) to a point marked NG/1/7/B (app. coord. 34E5793N79581) being Setoto borehole; thence leaving the trek route, in a straight line almost due north (5°) to a point marked NG/1/7/C (app. coord. 34E4803N79661) at beacon BPS

444; thence in a straight line NNW (341°) to point of commencement.

Controlled Hunting Area NG/2 (Nxaunxau)

Commencing at a point marked NG/1/2/A (app. coord. 34E4999N79268), being in the center of a molapo, appr. 1 km. south of boundary beacon BP 21/4; thence following the center of the molapo in easterly direction (100°) to a point marked NG/1/2/B (app. coord. 34E5300N79237) being the location of the well at Xabacha; thence following the main road to point marked NG/1/2/C (app. coord. 34E5423N79233), being the center of a molapo at Tjinipo cattlepost; thence following the center of the molapo in easterly direction (100°) to a point marked NG/1/2/D (app. coord. 34E5548N79212) being the first well at Tuxamecha cattlepost, thence in a straight line NNW (21°) to a point marked NG/1/2/E (app. coord. 34E5573N79278) being a point just north of Tuxamecha lands, at the intersection of the road Tsodilo-Chucumuchu; thence the road is followed in ESE direction (106°) upto a point marked NG/1/2/6/A (app. coord. 34E5725N79239) being a point appr. 6 km. from the kgotla of Tsodilo; thence to a point marked NG/2/6/A (app. coord. 34E5780N79210) being a point just south of the fields of Tsodilo; thence to a point marked NG/2/6/B (app. coord. 34E5805N79217) being a point of intersection with the road Tsodilo-Thamacha; thence to a point NG/1/2/6/B (app. coord. 34E5853N79212); thence the road is followed almost due east towards Thamacha upto a point marked NG/1/2/7 (app. coord. 34E5983N79212) being the center of the cattle trek route; thence the trek route is followed in a straight line in SSE, (152°) to NG/2/7 (app. coord. 34E6053N79078) being Thamacha borehole on the cattle trek route, from where the boundary goes almost due south (175°); thence to NG/2/3/7/8 (app. coord. 34E6075N79792) being at the intersection with the road Nxaunxau-Etsha, from where the boundary follows the road in the direction of Nxaunxau, to NG/2/3/A (app. coord. 34E5875N79843) being a point where a fossil river valley is entered, turning southwards to NG/2/3/B (app. coord. 34E5870N79830) where molapo-wa-mokgalo is entered; thence the boundary follows westerly direction (280°) through the center of the molapo to NG/2/3/C (app. coord. 34E5482N78853) being a pan appr. 22 km. west of Mokgalo borehole; thence in a straight line 4.5 km. or 2 molapo to the south, (185°) to a point NG/2/3/D (app. coord. 34E54795N78853) in the center of the molapo; thence following the molapo WNW (284°) to point NG/2/3/E (app. coord. 34E5056N78953) being a point in the center of Sankora molapo, one km. south of pans; thence the same direction is followed to point NG/2/3/F (app. coord. 34E4999N78964) being a point on the International Boundary with Namibia, a group of trees in the center of the valley; thence the border is followed due North (0°) to the point of commencement.