

MUKUNGULE GAME MANAGEMENT AREA



LAND USE PLAN

**Zambia Wildlife
Authority**
Private Bag 1
Chilanga,
Zambia.



APPROVAL PAGE

Implementation of this Land-use Plan for the Mukungule Game Management Area has been approved by the Board of Directors of Zambia Wildlife Authority at its 49th meeting held on 30th December, 2004.

Signature:.....

Name

Honorable Chief Mukungule

30th December, 2004

Signature:.....

Name

CRB Chairperson

30th December, 2004



Hapenga Kabeta

Director General

Zambia Wildlife Authority

30th December, 2004



Vincent N. Kamuti

Board Chairperson

Zambia Wildlife Authority

30th December, 2004

TABLE OF CONTENTS

INTRODUCTION	1
1.1 BACKGROUND	1
1.2 LOCATION AND SIZE	1
1.3 TOURISM DEVELOPMENT	3
1.4 Local Community Participation	3
PHYSICAL AND BIOLOGICAL ENVIRONMENT	5
2.1 PHYSICAL ENVIRONMENT	5
2.1.1 Climate	5
2.1.2 Geology and Soils	5
2.1.3 Hydrology and Drainage	5
2.1.4 Relief and Topography	7
2.2 BIOLOGICAL ENVIRONMENT	7
2.2.1 Vegetation	7
2.2.2 Fauna	8
SOCIO-ECONOMIC SCENARIO OF THE MUKUNGULE GMA.....	12
3.1 Establishment of the GMA	12
3.2 History of the Chiefdom	12
3.3 Livelihood Activities	15
3.3.1 CROP PRODUCTION	15
3.3.2 LIVESTOCK	16
3.3.3 Artefacts	17
3.3.4 Income Availability	17
3.3.5 Land Tenure	17
3.3.6 Expenditure patterns	17
GMA PURPOSE, SIGNIFICANCE STATEMENTS AND EXCEPTIONAL RESOURCES	18
4.1 GMA PURPOSE	18
4.2 SIGNIFICANCE STATEMENTS	18
4.3 EXCEPTIONAL RESOURCE VALUES	19
LAND-USE PROBLEMS, ISSUES AND CONCERNS	20
5.1 NATURAL RESOURCES	20
5.1.1 Land-use practices	20
5.1.2 Illegal Off takes of Wildlife and Other Natural Resources	21
5.1.3 Fire Management	22
5.1.4 Inadequate Information	22
5.2 PROBLEM AREAS AS LISTED BY THE COMMUNITY WORKSHOP PARTICIPANTS	22
5.2.1 Education	22
5.2.2 Health	23
5.2.3 Agriculture	23
5.2.4 Transport System	23
5.2.5 Clean Water Supply	23
5.3 MANAGEMENT AND OPERATIONS	25
5.3.1 Park Boundary	25

5.3.2	Community Awareness.....	25
5.3.3	Human Resource.....	25
5.3.4	Human Wildlife Conflicts.....	25
5.3.4	Hostility between ZAWA field staff and the community.....	27
5.4	COMMUNITY BENEFITS FROM THE WILDLIFE IN THEIR AREA....	27
5.4.1	Benefits from wild animals.....	27
5.4.2	Marketing and promotional strategy	27
5.4.3	Natural resource product development and craft.....	27
5.4.4	Tourism Development and Conservation Awareness.....	28
5.5	CULTURAL RESOURCES.....	28
MANAGEMENT OBJECTIVES.....		29
6.1	OVERVIEW	29
6.2	NATURAL RESOURCES OBJECTIVES.....	29
6.3	MANAGEMENT AND OPERATION OBJECTIVES	30
6.4	LOCAL COMMUNITY OBJECTIVES.....	31
6.5	OTHER ORGANIZATIONS/INSTITUTIONS OBJECTIVES	31
6.6	CULTURAL RESOURCES OBJECTIVES.....	32
LAND-USE ZONE PLAN		33
7.1	Land-use plan zoning concept.....	33
7.2	Rationale for the zoning concept.....	33
7.3	Land-use zoning scheme concept.....	35
7.3.1	Settlement zone	35
7.3.2	Buffer Zone.....	35
7.3.3	Hunting Areas.....	36
7.3.4	Sensitive Areas Zone	36
7.3.5	Management Zones.....	37
LAND-USE PLAN IMPLEMENTATION ACTIONS.....		38
8.1	OVERVIEW	38
8.2	NATURAL RESOURCES ACTIONS	38
8.3	MANGEMENT AND OPERATION ACTIONS.....	43
8.3.1	Management Guidelines.....	43
8.3.2	Revenue Generation	44
8.4	LOCAL COMMUNITY MANAGEMENT OBJECTIVES.....	48
8.5	CULTURAL RESOURCES MANAGEMENT ACTIONS	54
ENVIRONMENTAL CONSIDERATIONS.....		57
9.1	OVERVIEW	57
9.2	STRATEGIC ENVIRONMENTAL MITIGATION MEASURES	57
9.2.1	Mitigation Measures and Recommendations due to Construction of a Community Camp Site in a GMA.....	57
9.2.2	Mitigation Measures and Recommendations due to Establishment of a Safari hunting Camp.....	59
PROJECTION OF REVENUE AND EXPENDITURE FOR THE MUKUNGULE GMA		61
10.1	OVERVIEW	61

10.2	EXPECTED REVENUE	61
	Financial Projections from Tourism.....	62
	Hunttable Species.....	64
10.3	EXPECTED EXPENDITURE FOR MANAGEMENT AND DEVELOPEMNT OF THE GMA	66
IMPLEMENTATION PLAN.....		67
11.1	IMPLEMENTATION PRIORITY	67
	11.1.1 Natural Resources Management Action Priorities	67
	11.1.2 Management and Operation Action Priorities	68
	11.1.3 Local Community Management Action Priorities	68
	11.1.4 Cultural Resources Management Action Priorities	69
11.2	MONITORING, EVALUATION AND FEEDBACK.....	69
	11.2.1 Monitoring.....	69
	11.2.2 EVALUATION.....	70
	11.2.3 FEEDBACK.....	71

LIST OF ABBREVIATIONS AND ACRONYMS

AMU	Area Management Unit
BAMU	Bangweulu Area Management Unit
CRB	Community Resource Board
EPB	Environmental Project Brief
EIA	Environmental Impact Assessment
FZS	Frankfurt Zoological Society
FNH	Foundation for Nature and Humanity
GMA	Game Management Area
GMP	General Management Plan
GRZ	Government of the Republic of Zambia
Km	Kilometres
Km ²	Square Kilometres
LUP	Land-use Plan
NLWCCD	North Luangwa Wildlife Conservation and Community Development
NLCP	North Luangwa Conservation Project
NLNP	North Luangwa National Park
Mger HR	Manager Human Resources and Administration
M	Meter
Mm	Millimetres
ZAWA	Zambia Wildlife Authority
ZNTB	Zambia National Tourist Board

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

The development of the Land-use plan for the Mukungule GMA started in 2003, with financial support from the Frankfurt Zoological Society (FZS) through the North Luangwa Conservation Project (NLCP). The Zambia Wildlife Authority (ZAWA) is responsible for the preparation of the plan. The planning team was drawn from the Department of Planning Monitoring and Evaluation, the Extension Services Department, the Area Warden of BAMU and the Technical Advisors of the NLCP. This land-use plan will be regarded to be equivalent to a General Management Plan for the GMA and will be regarded as per requirement in the Zambia Wildlife Act No. 12 of 1998 *section 7 (3)*.

1.2 LOCATION AND SIZE

Mukungule Game Management Area is located on the western boundary of the North Luangwa National Park (NLNP) in Mpika District of the Northern Province. The GMA is in Chief Mukungule's area. The size of the GMA is 1900Km² lying between latitude 11°10' South to 11°53' South and longitude 31°36' East to 32°14' East. The greater part of the boundary between Mukungule GMA and the NLNP is the Muchinga escarpment. The description of the exact boundary is found in the Statutory Instrument No. 136 of 1998. (Appendix I)

1.3 TOURISM DEVELOPMENT

Natwange Community Campsite is the only tourism facility operating in the Mukungule GMA. It became operational in 2002. There is also small-scale consumptive hunting from individuals. The table below shows the flow of tourists between 2002 and part of 2004.

Table 1. Visitor numbers at the Natwange Community Campsite

Year	Number of Visitors
2002	65
2003	48
2004 (up to End of July)	39

1.4 Local Community Participation

People's needs drive the land-use planning process. Local farmers, other land users and the wider community who depend on the land must accept the need for change in the land use, as they will have to live with the land-use planning process results. Planning has to integrate the information about the suitability of the land, the demand for alternative products or uses and the opportunities for satisfying those demands on the available land now and in the future. In this regard the planning process involved the local community through holding community meetings, two community workshops and frequent visits and consultations with the VAGs and the CRB.



Figure 2: Participants at the First Community workshop held at Katibunga Middle Basic School

CHAPTER TWO

PHYSICAL AND BIOLOGICAL ENVIRONMENT

2.1 PHYSICAL ENVIRONMENT

2.1.1 Climate

Mukungule GMA is located in the high rainfall ecological zone with average annual precipitation of about 900mm and above. The GMA experiences typical tropical climatic conditions with three distinct seasons namely hot-wet season (November to April), cool-dry season (May – August), and hot-dry season (September to November).

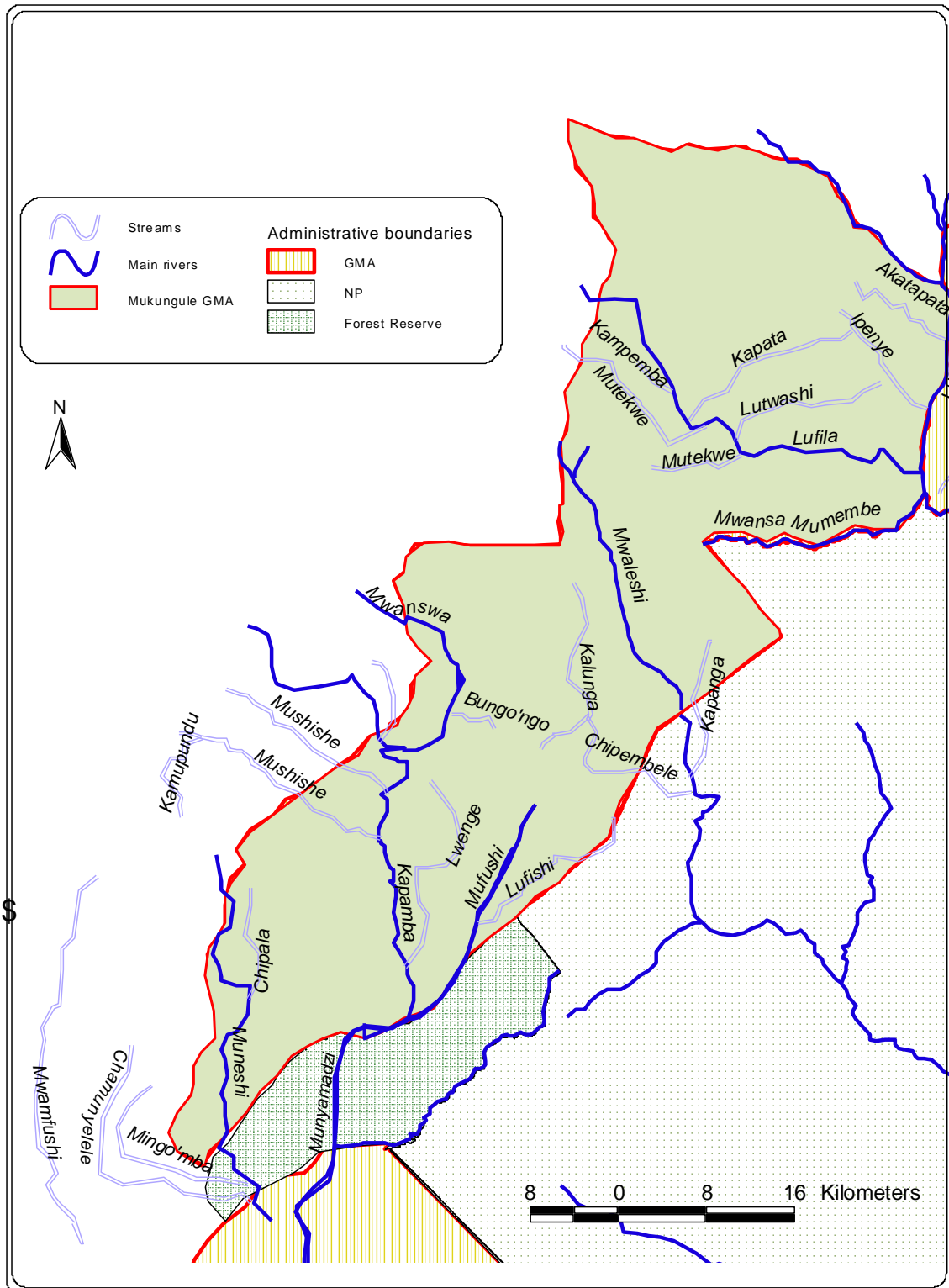
2.1.2 Geology and Soils

Part of Mukungule GMA is a continuation of the Central African Plateau and more than 70% of the total GMA is arable land. However, the soils are highly weathered and leached soils. The general soil characteristics include the Lunzua soil series (*moderately well drained, yellowish red to brownish yellow sandy clay loam to sandy clay soil with sandy loam or sandy clay loam top soil. Laterite gravel, sheet laterite weathered rock may occur in the lower sub soil. Mottles may be present in the below 60cm.*), Nkolemfumu soil series (*Well drained, yellowish red sandy clay soil with sandy clay loam to loamy sand top soil*) Kaombe soil series (*well drained, duplex soils with dark reddish brown clay loam upper subsoil over a yellowish red clay lower subsoil. The topsoil is sandy loam to loam. The soil has strong sub angular blocky structure*) and Mulolwe soil series (*well drained, red to dark red clay with sandy clay loam to silty loam topsoil, moderate to strong sub angular blocky structure*) Lungu (2001). Lime is not required on virgin soils that have not been treated with fertilizer. Studies by Wood (1985) showed that fertilizer use will induce acidifying effects and will hence induce demand for lime application.

2.1.3 Hydrology and Drainage

Mukungule GMA has a number of perennial rivers and streams and contains their catchments areas. These include Kapamba, Mwaleshi, Lufila and Luswa rivers, Muneshi, Mwanswa, Mushishe, Mufushi, Chipembele streams. The streams in the GMA are characterised by a few small dambos while the rivers are incised and do not form dambos (sections that are in the GMA) on their margins. These rivers and streams form an important integral part of the drainage system of the NLNP.

Figure 2. Map of rivers in Mukungule GMA.



2.1.4 Relief and Topography

The Mukungule Game Management Area generally lies about 1200m above sea level although the northern most part of the GMA comprises loose standing hills elevating to about 1500m above sea level at the foot of the Muchinga escarpment. The southwest boundary of the GMA follows the Kalenga Mushitu range while the southeast boundary with the North Luangwa Park follows the Ibangwe hills.

2.2 BIOLOGICAL ENVIRONMENT

2.2.1 Vegetation

Smith (1995) describes the prevalent vegetation type in the upper Muchinga escarpment and its attendant foothills under the umbrella of Miombo woodlands. The dominant vegetation type in this category is the *Brachystegia-Julbernardia-Isobertia*, which can further be separated into three distinct vegetation subtypes dictated by substrate. *Subtype 1* occurs over most of the upper escarpment, on deep laterite soils. *Subtype 2* is found in isolated patches on shallower plateau soils. *Subtype 3* is associated with the occasional granite outcrops dotted throughout the escarpment terrain

Subtype 1 –Upper Escarpment Miombo Woodland

Upper escarpment Miombo woodland takes the form of two-storeyed woodland with an open to lightly closed canopy of semi evergreen trees 15-20m high. The grass layer is typically sparse.

Characteristic canopy trees include *Julbernardia paniculata*, *Brachystegia spiciformis*, *Brachystegia utilis*, *Isobertia angolensis*, *Marquesia macroura*, *Parinari curatellifolia*, *Brachystegia manga* and *Pericopsis angolensis*. Common lower storey trees are *Brachystegia stipulata*, *Uapaca* spp., *Cratersiphon quarrei*, *Phyllocosmos lemaireanus*, *Mimocylon flavovirens*, *Dalbergia nitidula*, *Combretum zeyheri*, *Brachystegia longifolia*, *Aniophyllea pomifera*, *Dilorhynchus condylocarpon* and *Pseudolachnostylis maprouneifolia*. Frequent shrubs are *Keetia gueinzii*, *Keetia vnosa*, *Rothmania englerana*, *Landolphia parvifolia* and *Protea* spp. Climbers are frequent in this vegetation type. The grass layer is sparse and generally restricted to scattered clumps predominantly tall grasses. Common species are *Andropogon chinensis*, *A. schirensis*, *Anthephora elongata*, *Heteropholis sulcata*, *Loudetia simplex* and *Sporobolus sanguineus*.

Subtype 2 – Plateau Miombo Woodland

Plateau Miombo woodland is of single storey structure and is characterised by smaller trees, such as the *Uapaca spp.* In addition, the shrub and grass layers are comparatively well developed. This subtype occurs on the comparatively shallow, infertile soils characteristic of the plateau peneplain and may be secondary Miombo woodland, which has arisen due to fire and past cultivation.

Subtype 3 – Ripicolous Miombo Woodland

The rocky outcrops and granite kopjes of the Muchinga Escarpment support a distinctive vegetation type and although many of the species listed above may occur, additional species such as *Carphaelia pubescens*, *Schrebera trichoclada*, *Kirkia acuminata* and *Tarenna neurophylla* are typical. Smith P. P. (1995)

The complete list of vegetation as illustrated in the Vegetation Survey done by Smith P. P. (1995) is attached as appendix II.

2.2.2 Fauna

An indication of the wildlife stocks in the Mukungule GMA can be obtained from a SRF census, which was done in October 2001 by the North Luangwa Conservation Project Team.

Table 2: Wildlife Stocks of Mukungule GMA as at October 2001 (Survey area: 1,910Km²)

Species	Population Estimates	Standard Error	95% CL	CL as % of Estimate
Buffalo				
Duiker	39	18		92
Eland	876	727		166
Elephant	156	57	±114	74
Hartebeest				
Impala	1,951	848		87
Puku	701	246		70
Roan	360	257		143
Sable	19	18		191
Waterbuck				

Wildebeest	417	400		192
Zebra				

(Insert Wildlife map)

In addition to the quantitatively obtained data, the local community residing in the GMA qualitatively provided a list of wild animals that they encounter or sight in the GMA.

Table 3. Matrix of Wildlife sighted in the Mukungule GMA

Type of animals	Approximate numbers sighted at a time	Area Sighted	Time of the year
Duiker	1– 2 (common)	Every where	All seasons
Bush pig	Plenty	Every where	All seasons
Monkeys & Baboons	Plenty	Every where	All seasons
Kudu	2 (not common)	Mukungule, Chobela, Chishala, Chipelembe village and Chisansa stream (Kaluba)	April – Sept
Buffalos	More than ten	Chishala, Chobela, Mukungule, Lufila river, Mutekwe, Munenshi river and Chisansa swamps	All seasons
Elephants	Plenty (common)	Chishala, Nkomba, Mukungule, Chobela, Mufushi stream and Lufishi	-Dry hot season in Mufushi stream and Lufishi -Anytime in the other areas

Lions	1 – 2, sometimes 4	Follow other animals	Follow animals
Hippo	3 (common)	Kampamba, Mwaleshi, Lufila, Mwanswa, Mupete and Muneshi rivers	Rain season
Bush buck	2 (common)	Everywhere	All seasons
Sitatunga	3 (not common)	Mwamfushi – Chipundu area	All seasons
Zebra	8 - 15	Mukungule, Chobela, Chishala	June - December
Water buck	Plenty	Everywhere	All seasons
Eland	5 - 20	Nkomba, Chobela, Chishala	April – Aug (Chobela, Chishala) August – Dec (Nkomba)
Grysbok (Katili)	1	Nkomba, Chobela, Chishala and Mukungule	All seasons
Hyena	1	Chobela, Nkomba	All seasons
Sable Antelope	50+	Nkomba, Chobela, Chishala and Mukungule	July - December
Reedbuck	3 - 10	Nkomba, Chobela, Chishala and Mukungule	All seasons
Roan Antelope	8 - 10	Nkomba,	May -

		Chishala and Mukungule	December
African Jackal	1 - 2	Nkomba, Chobela, Chishala and Mukungule	All seasons
Porcupine	1 - 2	Nkomba, Chobela, Chishala and Mukungule	All seasons
Leopard	1 - 2	Nkomba, Chobela, Chishala and Mukungule	All seasons
Warthog	1 - 15	Nkomba, Chobela, Chishala and Mukungule	All seasons
Crocodile	1 - 5	Kapamba, Mwaleshi and Lufila rivers	All seasons

CHAPTER THREE

SOCIO-ECONOMIC SCENARIO OF THE MUKUNGULE GMA

3.1 Establishment of the GMA

Mukungule was established as Game Management Area No. 39 through Statutory Instrument No. 136 of 1998. The GMA covers about 90% of the area of the Mukungule Chiefdom.

3.2 History of the Chiefdom

The subjects of Mukungule Chiefdom originated from the Luba tribe in Kola (now Democratic Republic of Congo). Their trek ended when they settled in the Luangwa valley in the 17th Century. They were relocated to the Western side (the current location of the Chiefdom) of the Muchinga escarpment in 1945 after the valley was identified as a good location for designation as a game reserve. The two main local tribes of the Mukungule Chiefdom are Bisa and Bemba.

The Chiefdom has only one traditional heritage site at Marula Puku Camp where they go yearly in October to lay stones. This is the site where they used to embalm and keep the remains of their dead chiefs for one year prior to burying them at Shiwangádu (the earlier chiefs) and later at Bungóngo (successive chiefs).

There are approximately three thousand (3000) households with an approximate population of sixteen thousand (16000) inhabitants (approximate figures were obtained using a household registration form, which was administered by VAG committee members).

The GMA has 9 Village Action groups namely: Mwansabamba (short boundary with park), Chipundu (no boundary with park), Kashaita (no boundary with park), Kaluba (short boundary with park), Katibunga (no boundary), Chobela (medium boundary), Mukungule (long boundary), Chishala (long boundary) and Nkomba (long boundary).

The Community Resource Board for the Mukungule GMA was established in April 2004. It is still in the infancy stage and is yet to be registered with the Zambia Wildlife Authority.

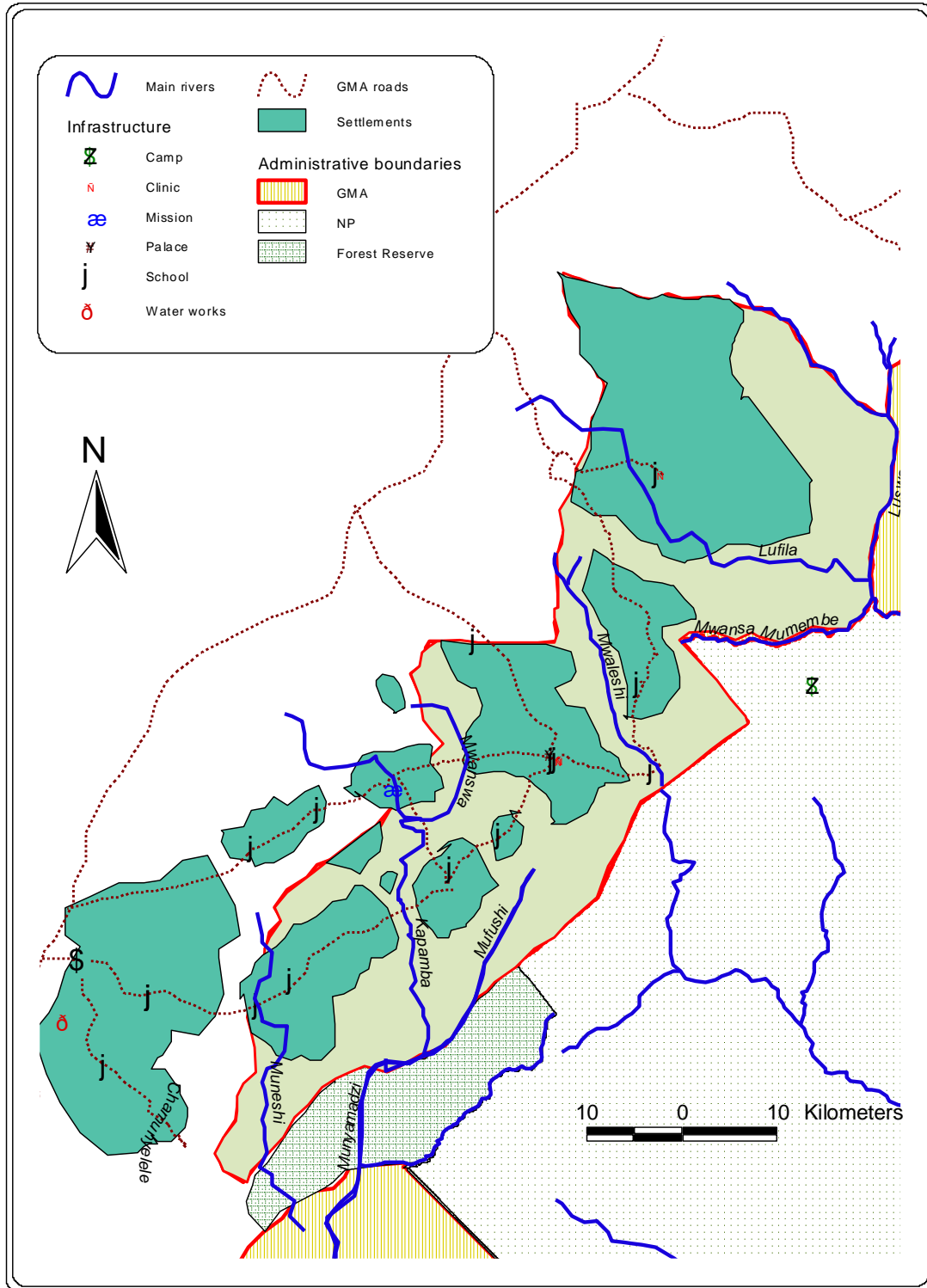
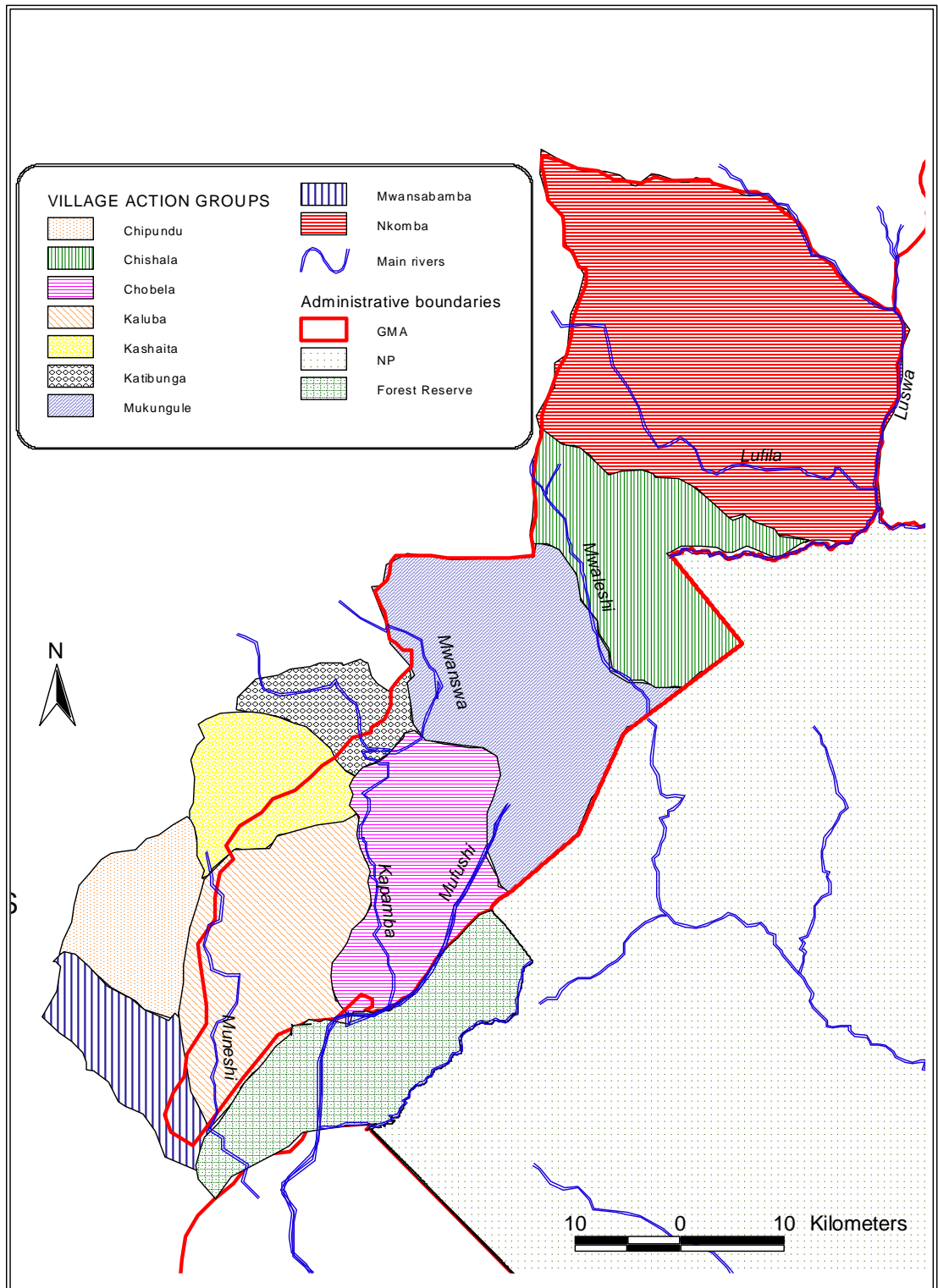


Figure 4: Main Settlements in the Mukungule GMA

Figure 4: Village Action Groups of the Mukungule GMA



3.3 Livelihood Activities

In general terms, the livelihood of people in the GMA are primarily based on combining strategies and resources relating to livestock production, crop-based agriculture and gardens, natural resource utilization (weaving, hunting, fishing, carving) and exploitation of income opportunities (including employment in the park).

The people of the GMA are vulnerable for a variety of reasons including variable rainfall; the presence of wildlife species and predators (resulting to loss of crops to elephants and other herbivores, and livestock losses to carnivores); lack of secure land tenure, poor access to markets; limited alternative sources of income; and health risks associated with HIV/AIDS, malaria and others.

3.3.1 CROP PRODUCTION

The local community describe crop productivity as having improved compared to the way it was the years before. The major contributing factor to the increase has been attributed to improvement in extension services provided by both the government institutions and agricultural based Non Governmental Organizations. The extension service has helped farmers to diversify their choice of crops grown each season and in some cases farmers have been introduced to practicing conservation farming methods. However, the slash and burn (Chitemene) method is still widely used to grow finger millet.

Crop cultivars grown include groundnuts, finger millet, sweet potatoes, cassava, sorghum, sunflower, soybeans, beans, peas, monkey nuts, vegetables and cowpeas that are less input demanding. Maize is the main staple food but has dropped in prominence due to high costs of fertilizers. Consequently, Chitemene practice has gone up.



A lady harvesting finger millet from a Chitemene field

3.3.2 LIVESTOCK

In the past, people in the GMA only used to keep chickens because they used to depend on game meat for most of their protein requirements. At present some households keep a variety of livestock because the law enforcement activities to prevent poaching (hunting) have intensified thereby limiting the community from appropriating game meat for their consumption. In addition, households have come to realize that they can earn some income from selling their livestock.

Livestock kept include sheep, goats, pigs, cattle, chicken, rabbits, guinea fowls, doves, guinea pigs and ducks.

3.3.3 Artefacts

They carve mortars, stools and chairs, axe handles, cooking sticks and doors. Basketry products include baskets, reed mats, and hats. Blacksmith products are mainly axe and hoes.

3.3.4 Income Availability

Workshop participants indicated that households in the Mukungule GMA realize more income from selling groundnuts, sunflower, beans, Chickens, goats, pigs, sheep and doors. Maize, finger millet and cassava generate medium earnings because for these crops, households have to share between selling and home consumption. This is confirmed by a study on livelihoods for Mukugule and Chikwanda areas done by Hichaambwa and Chintu (2000) who found that groundnuts were the second highest income earner by the communities in the study areas after beer brewing.

Income from crops is received mostly from February to December while income from livestock and doors is received throughout the year.

3.3.5 Land Tenure

The Chief is the custodian of all the land in the GMA. The subjects of the Chieftdom do not have title deeds for the land that they are occupying. Even those that stay in farm block (Chipundu VAG) do not have title deeds to the farms they occupy.

There is no order as to where households could locate their fields. The locations of fields follow family lineages where a household can lay claim to a piece of land based on where the ancestors performed their livelihood activities.

3.3.6 Expenditure patterns

The main areas of expenditure are purchasing farming inputs (in December - February), paying people to help with various farming activities, purchasing school requisites and medicines. Excess funds are spent on clothing and blankets.

CHAPTER 4

GMA PURPOSE, SIGNIFICANCE STATEMENTS AND EXCEPTIONAL RESOURCES

4.1 GMA PURPOSE

According to the Zambia Wildlife Act No.12 of 1998, a GMA has two objectives of addressing both sustainable natural resource management and use, and socio-economic development of the local people. The GMA has to be managed such that it is able to harmonize the long-term sustainable natural resources conservation practices with the livelihood activities of the local community for the benefit of the present and the future generations and the environment.

4.2 SIGNIFICANCE STATEMENTS

- I. Mukungule GMA contains catchments areas for Mwaleshi, Lufila and Kapamba rivers. It is therefore important and plays a major role in protecting the fragile ecosystem in the NLNP since the said rivers are part of the important ecosystem for the park.
- II. Mukungule GMA has some perennial streams namely Mufushi, Muneshi, Mushishe, Luswa and Chipembele, which drain into the Lufila, Kapamba and Mwaleshi rivers, which subsequently drain into the Luangwa River.
- III. Mukungule GMA combines human livelihood activities (agriculture) and wildlife habitat.
- IV. The current law enforcement mechanisms put in place for the NLNP is allowing animal numbers to improve meaning more animals reach the GMA and makes it possible to sustain hunting operations.
- V. Mukungule GMA has suitable soils (when used with good agricultural practices) and vegetation for agricultural activities both crop farming and livestock husbandry.
- VI. Mukungule GMA forms the integral and important part of the NLNP wildlife habitat

4.3 EXCEPTIONAL RESOURCE VALUES

The following were identified to be the exceptional resources in the Mukungule GMA:

- I. The GMA contains attractive mountain scenery. It has a number of mountain ranges including part of the Muchinga escarpment
- II. The GMA contains perennial rivers and streams and plains that offer concentration of game during the dry season and scenic beauty
- III. Village set up which can be used for community tourism
- IV. Large areas of the GMA do not have tsetse flies therefore potential for livestock farming
- V. Vegetation suitable for bee keeping.
- VI. Contains two waterfalls: one on the Kapamba and the other on the Mwaleshi rivers

CHAPTER FIVE

LAND-USE PROBLEMS, ISSUES AND CONCERNS

The problems and issues outlined were identified during the two community workshops, Planning team reconnaissance field visits and VAG and CRB formation meetings.

5.1 NATURAL RESOURCES

5.1.1 Land-use practices

Currently, the main use for land in Mukungule GMA is small-scale mixed farming where farmers grow crops and keep domestic animals. Except for Chipundu VAG where there are demarcated farm units, the rest of the GMA does not have designated areas for fields and grazing. As a result, individual farmers decide where to locate fields for the households. In some instances, fields have been taken to areas where there are a lot of animals or located along the animals' migration routes or close to riverbanks. These are the main areas of human animal conflict due to crop destruction by wild animals.

Another land-use practice, which causes some good degree of environmental concern, is cutting for Chitemene on slopes of hills and in watersheds. Cutting for Chitemene on the slopes of hills exposes the slopes to soil erosion and excessive radiation from the sun. This may consequently cause siltation in the rivers. Further, cutting in watersheds alters the ecological conditions for the areas thereby creating uncertainties for the sources of rivers and their tributaries in the future.



Figure 4: *A field on the bank of Muneshi River*

5.1.2 Illegal Off takes of Wildlife and Other Natural Resources

The GMA community is passive and sometimes residents are accomplices to illegal off takes of wildlife resources in the GMA. Members of the local community rarely report cases of illegal hunting (by both the residents of the GMA and those from other areas) to the relevant authorities.

Fish poisoning is another problem in the GMA. Poison does not discriminate between fish and other aquatic fauna or between fry and big fish. As such, poisoning of fish affects the operation of the ecological system in the rivers.

Another potential problem is the cutting down of tree resources. This problem can also contribute to silting of river and stream systems through soil erosion.

5.1.3 Fire Management

The burning of the Chitemene fields causes most of the fires that rage in the GMA. Most of the Chitemene fields are burnt in late September to October because farmers have to wait for the tree branches to dry before burning them. Such late fires cause a lot of damage to the forest system due to intense heat, which they generate.

5.1.4 Inadequate Information

There is need to carry out more detailed ecological studies in the GMA so as to gather information on the wildlife stocks for the area, impact of human activities on the wildlife habitats and ecological effect of agro-chemicals on the water systems.

The resident community also needs to be sensitised on the issues pertaining to natural resources conservation, i.e. how they can participate and how they can obtain benefits through sustainable conservation.

5.2 PROBLEM AREAS AS LISTED BY THE COMMUNITY WORKSHOP PARTICIPANTS

5.2.1 Education

There are a number of incomplete school structures in the GMA reducing the available school places for the school going population. This leads to low levels of education.

Accommodation for teachers is inadequate at all the schools in the GMA. This demotivates the trained teaching staff as such there are a number of unqualified volunteer teachers in the area. Volunteer teachers run some of the Community Schools.

The Ministry of Education does not supply schools with school materials like teaching guidebooks, equipment for practical demonstrations etc.

5.2.2 Health

There are only two clinics in the whole GMA covering an area of more than 1900Km² with a population of more than 16,000 inhabitants.

5.2.3 Agriculture

The agricultural input supply and marketing system is poor and unpredictable. Farmers experience problems in sourcing inputs for agriculture and also there are no markets for the farm produce.

Further, there are no agricultural loans schemes to enable farmers get loans to acquire livestock.

5.2.4 Transport System

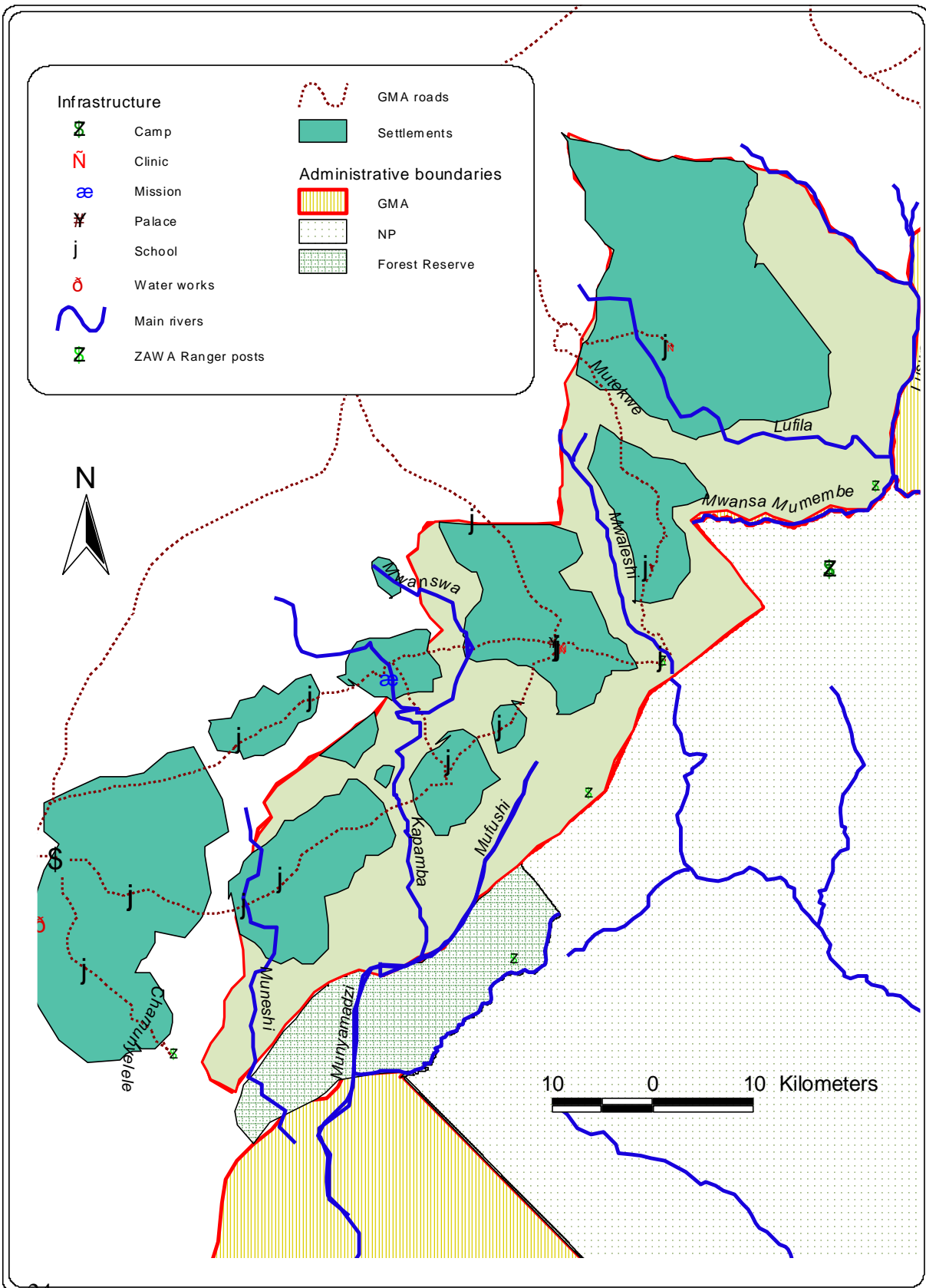
There are no bridges on the Kapamba river (road connecting Mpika boma and Mukungule via Kaluba), Mwaleshi River, Kapata and Lutwashi streams. Bridges on these rivers would form important access routes in the GMA.

The road infrastructure in the GMA is in a poor state. In addition, there is no public transport system for both humans and the farm produce.

5.2.5 Clean Water Supply

There is a problem with clean water supply especially during the hot dry season.

Figure 6: Infrastructure in the GMA



5.3 MANAGEMENT AND OPERATIONS

5.3.1 Park Boundary

The boundary between Mukungule GMA and the North Luangwa National Park on the stretch south of Mano Camp is not clearly defined and needs re-verification and marking. As the situation is, the local community may carry out their livelihood activities in areas that encroach into the park.

5.3.2 Community Awareness

There are few sensitisation programs on how the community can participate in the management of the wildlife stock in their GMA. There is need for the local community to be sensitised on the roles of the Zambia Wildlife Authority and other stakeholders in the management of the wildlife.

Further there is also need to emphasise on the need for the local communities to improve on the productivity of their livelihood activities by utilising organic farming method. Extension services in this area need to be expanded.

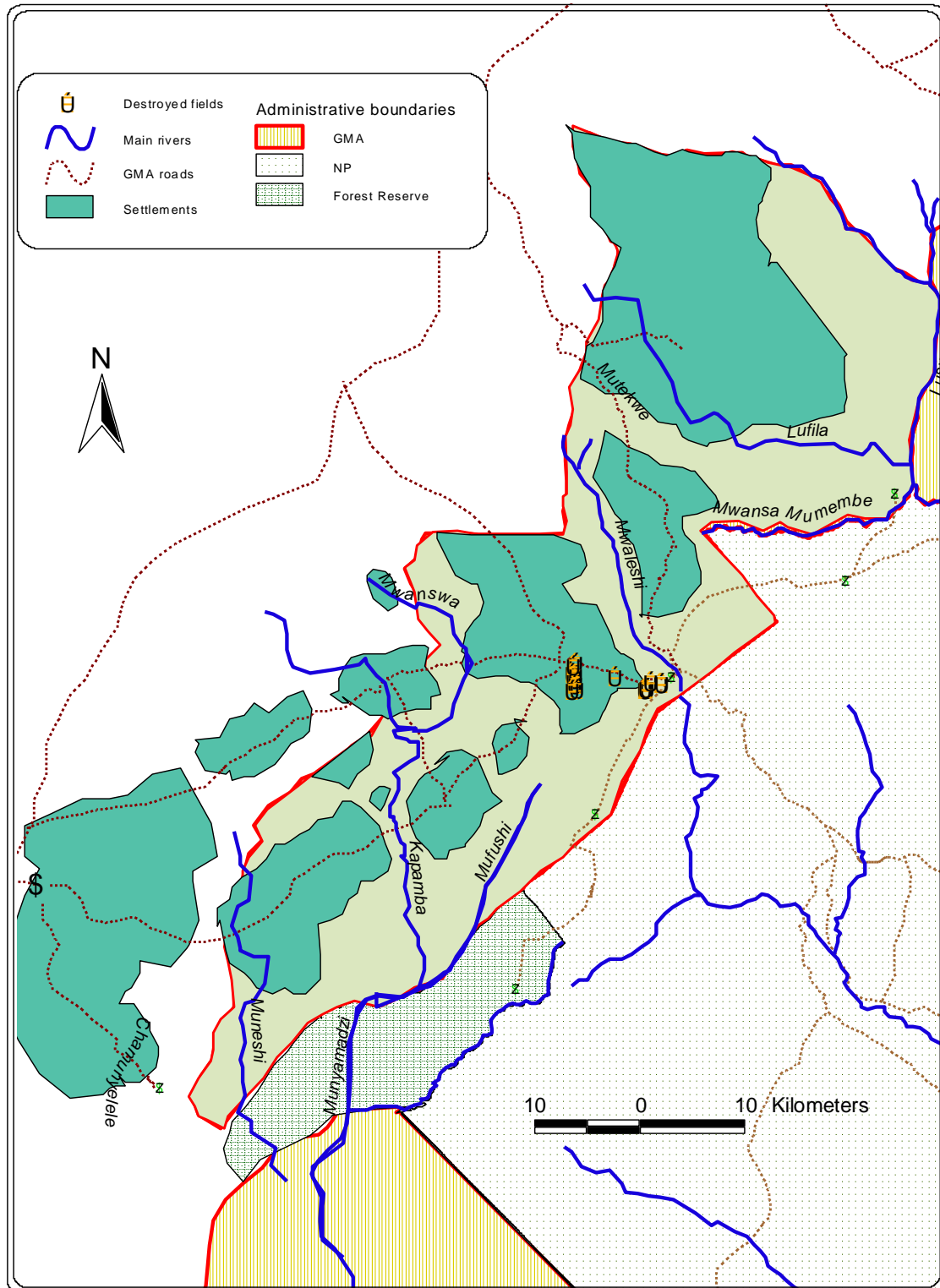
5.3.3 Human Resource

The Zambia Wildlife Authority does not have sufficient human resource and other requisite equipment to adequately patrol and protect animals that are in the GMA.

5.3.4 Human Wildlife Conflicts

The local community report an increase in wildlife sightings in the GMA resulting in increased human wildlife conflicts. This perception affects the extent to which the local community will support the natural resources conservation initiatives and efforts. Human Wildlife conflict is, however, a complex problem with no single easy solution. Human Wildlife Conflicts has a variety of impacts on livelihoods and people incur a number of different costs (direct and indirect). In Mukungule, Kabuta, Chibale, Muyeleva and Kabungo villages, thirteen cases covering total field area of 123,864.67m² have so far been reported in 2004. This is a significantly large area for so few cases considering that production is at peasant scale.

Figure 3: **Fields destroyed by wild animals in Kabuta, Muyeleka and Chibeka villages**



5.3.4 Hostility between ZAWA field staff and the community

There is a misunderstanding on the operations of ZAWA in the GMA. The community feels that ZAWA officers victimize them and that the operations that are conducted in the villages are in some instances not conducted according to the law.

The community also feels that the licensing of animals on quotas is in some instances not done in a transparent manner.

5.4 COMMUNITY BENEFITS FROM THE WILDLIFE IN THEIR AREA

5.4.1 Benefits from wild animals

The community of Mukungule GMA currently does not obtain direct or indirect benefits from the wild animals that are found in their area. There is neither a commercial hunting safari outfitter nor any other tourism activity-taking place in the GMA. The Natwange Club operates the only Campsite that is in the GMA and the proceeds do not go towards the improvement of the standard of living for the general local population but for the members to the Natwange club.

5.4.2 Marketing and promotional strategy

During the past seven years, that has seen a positive trend in the numbers of the animals' population in the adjacent NLNP there has also been an increase in animals sighted in the GMA. Despite this observation, no deliberate strategy was developed either by the local community or other relevant government agencies to try to explore and market the tourism potential (both consumptive and none consumptive) of the GMA.

5.4.3 Natural resource product development and craft

Many people in the GMA are involved in production and sale of crafts (principally baskets). The incomes they receive for these vary but can contribute to pay for house consumption items and food, or cover the costs of schooling and health care. This source of income could be an important addition to livelihood security.

Constraints to further expansion of these enterprises include lack of access to markets in the local district, at national and international level.

There is also a possibility of utilizing natural resources by way of honey production at a more commercial value than is currently being utilized.

5.4.4 Tourism Development and Conservation Awareness

In the General Management Plan for the NLNP there is planned for a number of tourist accommodation facilities, an indication that there would be improved tourism activities in the park. In the event that the planned tourism improvements become a reality, there is need for the Mukungule Community to be developed and strengthened in skills such as tour guiding, camp construction, visitor management, hospitality skills, marketing and tourism investment management. The fact that Mukungule GMA is located on the route to the main gate of the NLNP could be to the advantage of the community.

5.5 CULTURAL RESOURCES

There is need to document the cultural heritage of the Mukungule Chiefdom, identify sites of cultural significance and package these for promotional purposes.

CHAPTER SIX

MANAGEMENT OBJECTIVES

6.1 OVERVIEW

Local communities have always used and managed the resources in their environment. The management of the resources was within social structures and cultural norms centered on communal ownership and the interest and welfare of a homogenous group. The sizes of the groups were small as were the scales of management. Institutions for management evolved within village level governance structures.

The system applied at low human population levels and low resource demand ratios and worked well under these conditions. It broke down from colonial period to the present with changes in scales of government away from local level, increase in human population, increasing resource demands and new land use practices. The land-use practices require that the integrity of the adjacent NLNP be sustained but at the same time the local population should be empowered to undertake livelihood activities that would ensure their food security.

The objectives outlined therefore describe the desired future conditions for the GMA so that it continues to provide resources for the local community as well as biodiversity conservation. The objectives form important targets for guiding and evaluating all management actions to be implemented under this plan.

6.2 NATURAL RESOURCES OBJECTIVES

Mukungule GMA is endowed with rivers, streams and springs, which are perennial, arable land, forestland and wildlife. It is important that these resources are managed in a harmonized and sustainable manner for the benefit of the present and future generations and also for the good integrity of the local environment. The following objectives are set to improve the natural resource management:

- To establish by-laws by which to manage fires
- To maintain law enforcement activities by Wildlife Police Officers and Scouts
- To put in place a wildlife monitoring system for large animals

- To put in place a system that would discourage cutting for Chitemene along the rivers, sensitive catchments area and at sources.
- Discourage cutting for Chitemene on the slopes of the hills
- Employ good methods of farming especially on the slopes

6.3 MANAGEMENT AND OPERATION OBJECTIVES

The following objectives are set to outline the management and operations targets for the effective management of the GMA:

- To clear up the misunderstanding on whether Mwansa mumembe scout camp is located in the park or in the GMA
- To carry out a verification exercise on the park boundary on the section south of Mano camp
- To clear (e.g. slashing) the entire stretch of the boundary between the GMA and the park
- To designate the whole GMA as a hunting block
- To market the hunting block
- To maintain sufficient manpower and equipment to protect the resources of the GMA
- To maintain and continue to improve law enforcement by staff
- To improve and maintain the existing wildlife camps
- To improve on the networking and collaborating with other organizations/institutions that are operating in the GMA
- To finalize establishment of the Community Resource Board and assist the board to become operational
- To support programs that aim at minimizing human wildlife conflicts

6.4 LOCAL COMMUNITY OBJECTIVES

Conservation objectives must create situations whereby conservation and other social and economic objectives can simultaneously be met. Conservation initiatives must be coupled with activities that should enhance and improve the standard of living of the local community in the GMA by way of providing employment, income generating opportunities and food security. The following objectives are set to address the outlined scenario:

- To improve on cooperation between ZAWA and the community
- To improve awareness education on conservation
- To encourage local residents to participate in prevention of illegal off takes of wildlife
- To encourage the members of the community to locate their fields in areas where scaring of problem animals can be consolidated
- To encourage use of alternative farming methods (e.g. conservation farming) other than using chemical fertilizers
- To encourage crop diversification
- To encourage alternative livelihood activities like fish farming, bee keeping
- To encourage livestock farming in areas that are suitable for such activities
- To empower the CRB so that it can actively participate in marketing the GMA and source for initial funds for operations
- To identify markets for craft products
- To encourage programs that enable people to have alternative sources of income

6.5 OTHER ORGANIZATIONS/INSTITUTIONS OBJECTIVES

Below are objectives that could be achieved via contribution by other organizations/institutions

- To improve access to loans for farming inputs

- To improve access to appropriate farming technologies
- To improve access to effective extension service
- To improve the GMA access roads and public transport system
- To undertake educational awareness campaigns to encourage households to dig and use pit latrines

6.6 CULTURAL RESOURCES OBJECTIVES

- To ensure the preservation of heritage resources while allowing access to the same by the local and international tourists for nature education and scientific purposes
- To promote and create awareness on the value and significance of cultural heritage resources
- To develop, promote and preserve cultural heritage sites and tourist attractions

CHAPTER SEVEN

LAND-USE ZONE PLAN

7.1 Land-use plan zoning concept

Land-use zoning is concerned with what should be done, where. The aim is to zone the GMA in such away that the activities to be undertaken in each zone would be responsive to needs for enhancing food production capacity, socio-economic empowerment of the local community, without compromising the requirements for sustainable natural resources conservation.

7.2 Rationale for the zoning concept

A number of things were taken into consideration when developing a zoning scheme for the GMA to ensure that it:

- Offers protection to identified exceptional resources and values
- Takes note of the physical limitations imposed by the landscape and important ecological features
- Takes note of the activity implementation limitations for implementing agencies
- Continues to be the local people's base for livelihoods
- Protects environmentally sensitive areas e.g. river banks, sources of rivers/streams and wildlife habitats

7.3 Land-use zoning scheme concept

7.3.1 Settlement zone

Purpose: For continued settlement of the community

Access: The settlement zone can be accessed by road though the road infrastructure is in poor state. There is also an airstrip at Mano camp.

There is no case of a settlement that is located in the park area at present. Settlements are generally located more than five kilometres (except for Kabuta and White villages) away from the park boundary. There are approximately three thousand households with a population of about sixteen thousand people.

Future Developments: People to continue with their livelihood activities in the settlement areas. There is however need to relocate a family that has settled in the Mufushi valley and another family that has settled in Lubanga in Chishala, Kwisuba. These households are believed to be accomplices in illegal off take of wildlife by hosting poachers.

7.3.2 Buffer Zone

Purpose: This is the area between the settlement areas and the park boundary. This is the area where the local community could operate some tourism activities e.g. safari hunting, photographic tourism and campsite.

Access: Accessibility by local community to continue collecting honey, reeds, Chikanda (*Satiria Sativa*), firewood and wild fruits.

Access arrangements: Local community to arrange with the Safari operator on the schedules of going to collect the resources from the area.

Visitor experience:

- One campsite to continue operating but needs to be legally registered so that it can operate legally.
- Hunting safari outfitters
- Hiking

Future Development:

- Establish one more community Campsite on the southern boundary with Mano Camp.
- Hiking trails
- No Chitemene or any other fields

7.3.3 Hunting Areas

Purpose: These are the areas that will be allocated for commercial safari hunting purposes. To be located at the Luswa valley up to Kampanga stream, Luchembe and Mazela plains up to Mano camp, old White road from Mwansa mumembe to Lubanga stream, Mufushi valley area up to the confluence of Kapamba and Mufushi rivers.

Visitor use and experience:

- Commercial safari hunting outfits

Future developments:

- No permanent structures
- Hunting roads

7.3.4 Sensitive Areas Zone

Purpose: Sensitive areas are watersheds either at source or along the rivers. These areas to be recognized as areas to be used to protect the catchments areas i.e. source and about 300m along the banks of the rivers.

Visitor use and experience:

- Hiking
- Hunting Safari outfitters

Future developments:

- No human settlements
- No fields
- Could consider water based tourism

7.3.5 Management Zones

Purpose: These are the areas where the Zambia Wildlife Authority Scout Camps are located.

Access: All the six scout camps are accessible by road. Mano camp is also accessible by air.

Future Development: To complete the construction of better housing units for the staff at the camps.

CHAPTER EIGHT

LAND-USE PLAN IMPLEMENTATION ACTIONS

8.1 OVERVIEW

Land-use planning has to integrate information about the suitability of the land, the demand for alternative products or uses and the opportunities for satisfying those demands on the available land, now and in the future. As such, the proposed land-uses are identified in order to achieve the objectives relating to problems, issues and concerns of the Natural Resources, Local Community, Management and operations, cultural resources and Land-use Zones of the Mukungule GMA. These proposed actions constitute the Land-use plan for the Mukungule Game Management Area. The status of the implementation and the impacts of the implementation will be reviewed after three years to assess their appropriateness and whether they are producing the desired results or not. The local community through his Honour Chief Mukungule, ZAWA and the park management staff will approve all the proposed actions.

These proposed actions would provide guidance for the preparation of operation plans and budgets. The Mukungule GMA land-use plan provides statements of intent for managing the GMA's natural resources, responsible use of agricultural land and also provides a framework for developing improved land-use strategy for the GMA's natural resources. It is important to note that the success of the proposed actions would depend on high cooperation levels between ZAWA, the local community and other organizations operating in the GMA.

Each of the proposed action forms an integral to the maintenance of the GMA's biodiversity and socio-economic development of the local community. The proposed actions are described in the following tabular format. The categorization time frame of implementing the proposed actions from the time of ratifying the land-use plan is categorized as **short-term (1 month to 1 year and on-going actions), Medium-term (1 year to 2 years) and long-term (2 years to 3 years)**. The time frame is based on the fact that within three years, the land-use plan will be reviewed and some of the proposed actions will be fulfilled while some will be changed to conform to the prevailing situation at the time.

8.2 NATURAL RESOURCES ACTIONS

The problems, issues and concerns that Mukungule GMA faces pertain to bad agricultural practices, illegal of takes of wildlife, human wildlife

conflicts and wildfires. These negative activities seriously threaten the improvement of wildlife populations and sustenance of livelihood activities for the local community. The populations of large mammals that cross into the GMA have not been increasing as much as expected because the natural succession of the vegetation has been disturbed due to late bush fires. It is therefore emphasised that by-laws to govern the burning for Chitemene be introduced and enforced and the anti-poaching activities be intensified. Conservation measures are required for ecologically sensitive areas like the river catchments systems. The flora and fauna of the GMA will be maintained by taking the following actions:

- The ecologist to assist the community in coming up with bushfire management options
- The traditional set up to establish by-laws against late burning for Chitemene
- The traditional set up to establish by-laws against locating fields on the river banks
- Monitor wildlife and vegetation
- CRB to recruit CRB scouts
- Law enforcement on fish poisoning
- Collect data on wildlife and vegetation
- Effective law enforcement system put in place
- Monitor water quality in the rivers and streams of the GMA
- Provide further training to the Wildlife Police Officers

Table 4. Natural Resources Actions

No.	Management Objective	Action	Activity	Who	Time Frame	Priority
1.	To establish by-laws by which to manage bush fires	Elaborate the causes and effects of bush fire in the GMA	Literature review on incidences of bush fire in the GMA	ZAWA Ecologist	On going	Short, medium & long term
		Assist the local community to come up with bush fire management options	Hold discussions with the local community to get their views on effects of fire on the wildlife population and vegetation in the GMA	ZAWA Ecologist	Months	Short term
		Develop the sanctioning strategy for non by-law abiding residents	Process, document and pass the by-law on discouraging late burning for chitemene	The Royal Establishment in Mukungule GMA	1 year	Medium term
2	To maintain law enforcement activities by Wildlife Police Officers and Scouts	To provide further training	Identifying training needs and developing appropriate training module	NLCP/ Admin & HR Mger	On going	Short, Medium & Long-term
		To recruit CRB Scouts	Provide basic and advanced training in law enforcement skills to scouts	Mweka/ Chunga/ Southern Africa Wildlife College/ Nyamaluma etc		
		Enforce disciplinary code				
		Effective law enforcement system in	Identifying further education opportunities for scouts			

		place Empower the CRB so that it becomes in a position to recruit its own scouts	Identify ways by which the CRB could raise funds to start financing its operations Creating awareness of the disciplinary Code and implementing the code Providing good permanent housing for scouts	NLCP/ Mger. HR &Admin ZAWA Extension Office Mger. HR &Admin/ Con. &Mgt NLCP/ ZAWA		
3.	To put in place a monitoring system for large animals	Monitor wildlife Collect data Analyse and interpret data	Identifying corridors for monitoring wildlife Establish the populations and trends by conducting ground transect counts	NLCP/Ecologist NLCP/ Ecologist		
4.	To put in place a system that would discourage cutting for Chitemene along the rivers, sensitive catchments areas at sources of rivers	Educate local community on the disadvantages of exposing river banks and catchments areas	Assess the current Chitemene practice on the river banks and collect the necessary information Hold community meetings	Forestry Department/ ZAWA Extension Office Forestry Department/		

				ZAWA Extension Office		
5	Employ good methods of farming especially on the slopes	Provide extension services on good farming practices on slopes	Carryout sensitisation campaigns on the negatives of bad farm practices	Ministry of Agriculture		
6	To maintain good water quality in rivers and streams of the GMA	Monitor water quality in rivers and streams Law enforcement on fish poisoning	Encourage farmers to use more biological farming methods other than applying chemical fertilizers Collecting water samples from the rivers and streams in the GMA for analysis by relevant institutions Prosecuting fish poison users Carrying out environmental awareness on the dangers and un sustainability of using fish poison			

8.3 MANGEMENT AND OPERATION ACTIONS

The Zambia Wildlife Act No. 12 of 1998 section 28 and the Policy for National Parks and Wildlife in Zambia of 1998 require that any person who settles or lives in a Game Management Area conform to provisions of a management plan developed in agreement with other all stakeholders. Therefore, in line with this land-use plan, the park management, ZAWA, and the local community are expected to abide by the agreed actions so as to enhance natural resources conservation in the GMA thereby minimizing the disturbance of the GMA and the adjacent park's biodiversity and natural processes of the ecosystems.

8.3.1 Management Guidelines

The land-use plan for the Mukungule GMA has provided guidelines for use of each identified zone. The following uses require specific guidelines.

Camping

Camping shall be restricted to the Natwange Community campsite. Camping in areas in the GMA other than at Natwange will be by permit from the Mukungule Community Resource Board and camping fees shall be paid at the entrance gate. Information on the location and facilities at the campsite shall be available at the Mano entry gate.

Hiking

The CRB may introduce walking safaris at the Natwange Campsite. Introduction of walking safaris would require establishing walking safari routes. The routes would be determined according to circumstances and in consultation with the park management, ZAWA and other stakeholders. Operating walking safaris would however require that the CRB acquire communication equipment in order to be able to serve tourists especially in emergency cases.

Hunting

This land-use plan has recommended commencement of commercial hunting safaris in the Mukungule GMA. The commercial hunting activities will take place in areas that would be identified in consultation with the local community, ZAWA and the prospecting hunting outfitter.

Collection of Forest Products

The local community shall continue to get resources from the forest. There shall however be need to agree with the hunting outfitter/s on the timetable for forest products collection in order to minimize human activities and accidents in the hunting areas.

Farming

The mainstream livelihood activity for the local community shall continue. Fields shall be located in the settlement areas but not close to the park boundary. Efforts shall be made to locate fields such that the scaring of animals would be consolidated.

Regular Inspection

The park management and ZAWA shall carry out regular inspection of the campsite to ensure that the facility keeps up to the required conditions and standard and that the site is kept clean with all equipment functioning fully.

Monitoring

Natural resources and ecosystems e.g. water pollution, soil erosion, change of vegetation and plant communities, change of animal behaviour and distribution need to be monitored. Monitoring programs should be developed which includes observation, questionnaire, recording and interpretation of data at different time frames.

Carrying Capacity

Data should be collected on a continuous basis for both social and natural environment upon which to base their limits. This entails continuous monitoring of visitor activities and the environment at designated campsite so as to set up the carrying capacity for the site.

Park boundary

The boundary between the Mukungule GMA and the NLNP should be cleared to prevent human activity encroachment into the park and to minimize misunderstandings between the ZAWA patrol officers and the local community. The portion of the boundary south of Mano Camp should be verified and beacons positioned.

8.3.2 Revenue Generation

The Mukungule Community Resource Board would only become operational if funds are available for implementing community projects. In addition, the local community would accept the wildlife conservation initiatives in their area if and when they begin to realize benefits from the availability of the resource. It is therefore very important that the hunting block is advertised and concession be signed as soon as possible so that the GMA may start to generate some revenue for local utilization.

Table 6. Management and Operation Actions

No.	Management Objective	Action	Activity	Who	Time Frame	Priority
1	To clear up the misunderstanding on whether Mwansa mumembe scout camp is located in the park or in the GMA	Land surveyors, ZAWA and the NLNP	Engaging the land surveyors to remark the boundary	ZAWA/NLCP	1 year	Short term
		Management to remark the boundary	Surveying the portion that is in question	Surveyor general's office	1 year	Short term
		Collect information on the old location of the stream Mwansa mumembe or on whether there are two streams with the same name				
2	To carry out a verification exercise of the park boundary on the section south of Mano camp	Land surveyors, ZAWA and the NLNP	Engaging the land surveyors to remark the boundary	ZAWA/NLCP	1 year	Short term
		Management to remark the boundary	Surveying the section that is in question	Surveyor General's Office	1 year	Short term
		Hold public		PME	6 Months	Short term

		awareness meetings with all stakeholders				
3	To clear the entire stretch of the boundary between the GMA and the park	Hold public awareness meetings	Clearing the surveyed and marked boundary between the park and the GMA	NLCP/ ZAWA/ Community	1 year	Short term
			Putting up permanent markers along the surveyed and marked boundary	NLCP/ ZAWA, Community	1 year	Short term
4	To designate the whole GMA as a hunting block	Include Mukungule GMA on the list of hunting blocks to be leased	Advertise the hunting block in the public media	ZAWA/ NLCP	6 months	Short term
5	To market the hunting block	Market committee in place Compile information on wildlife stocks	Approach potential companies who would be interested in leasing the area	CRB/ ZAWA/ NLCP	6 Months	Short term
			Package marketing information	CRB/ ZAWA/ NLCP	6 months	Short term
6	To maintain and continue to improve law enforcement	Provision of appropriate equipment to ensure effective enforcement	Providing appropriate rations, communication equipment and other field requisites	NLCP/ ZAWA/ CRB	On going	Short, medium and long term

7	To improve networking and collaborating with other organizations/ institutions that are operating in the GMA	Hold consultative meetings with other institutions	Identify areas of overlap of areas of institutional interest Organize for joint public awareness meetings	PME/ ZAWA Extension /Other organizations	On going	Short, medium and long term
8	To finalize establishment of the Community Resource Board	Formulate the constitution of the CRB	Get the CRB registered with ZAWA Conduct training in different requisite areas for the smooth operations of the CRB	ZAWA extension/ CRB	3 months	Short term
9	To support programs that aim at minimizing human wildlife conflicts	Link CRB with projects that work towards minimizing human wildlife conflicts	Identify projects that work towards minimizing human wildlife conflicts			

8.4 LOCAL COMMUNITY MANAGEMENT OBJECTIVES

The following actions are recommended to under local community objectives:

- Inventory of local craft products
- Identify programs that can enable people to have alternative sources of income
- Conduct environmental education in schools in the GMA
- Conduct conservation awareness meetings with the local community
- Build capacity to undertake programs such as bee keeping, fish farming, gardening

Table 9. Local Community Management Actions

NO.	Management Objectives	Action	Activity	Who	Time Frame	Priority
1.	To improve cooperation between ZAWA and the Community	Conduct public awareness Sensitise ZAWA field staff on matters of treating suspects	Conduct community sensitisation activities on the need for the community to participate in prevention of illegal off takes of wildlife Conduct short training courses/ workshops for the ZAWA field staff on matters of suspects' rights	ZAWA/ NLCP/ CRB	On going	Short, medium & long term
2.	To improve awareness education on conservation	Carry out extension messages on the need for sustainable natural resources conservation Implement environmental/ conservation education in schools in the GMA	Disseminate extension messages on need for sustainable natural resources conservation Implement the environmental education curriculum in the schools in the GMA Reviewing the implementation of the curriculum	ZAWA/ NLCP/ CRB	On going	Short, medium & long term
3.	To encourage local residents to participate in prevention	Instil sense of ownership of wildlife into the local residents	Recruit CRB scouts	CRB/ ZAWA	On going	Short, medium & long term

	of illegal off takes of wildlife					
4.	To encourage the members of the community to locate their fields in areas where scaring of problem animals can be easy	Conduct public awareness	Conduct public awareness need for the community to consolidate their efforts in minimizing Human Wildlife Conflicts	NLCP/ ZAWA/ CRB	3 years	Long term
5.	To encourage use of alternative farming methods like conservation farming	Provide extension service on available technology in biological farming	Provide extension messages on biological farming technologies	FNH/ Min of Agric	On going	Short, medium & long term
6.	To encourage crop diversification	Provide extension messages on the need for crop diversification	Provide extension messages on the need for crop diversification	Min. of Agric/ FNH	On going	Short, medium & long term
7.	To encourage alternative livelihood activities like fish farming	Provide extension messages on the profitability of fish farming and bee keeping	Provide extension messages on the profitability of fish farming and bee keeping	FNH/ Forestry Dept/ Min of Agriculture	On going	Short, medium & long term

	and bee keeping					
8.	To encourage livestock farming in areas that are suitable	Provide extension messages on the advantages of livestock farming	Provide extension messages on the advantages of livestock farming	Ministry of Agriculture/ FNH	On going	Short, medium & long term
9.	To empower the CRB so that it can actively participate in marketing the GMA and in operating the community camp sit	Conduct training in business and financial management	Train VAG and CRB members in business and financial management	NLCP/ ZAWA/ CRB/ FNH	6 Months	Short term
		Make the operations of the Natwange camp site legal	Register the Natwange camp site with the commercial services department at ZAWA	ZAWA/ CRB	5 Months	Short term
			Facilitate the transfer of the operations of the Natwange camp site from a club to the CRB	ZAWA/ NLCP/ CRB	6 Months	Short term
10.	Identify markets for craft products	Inventory of possible local tourism products	Carrying out an inventory of possible local tourism products	NLCP/ ZAWA/ CRB	2 years	Medium term
		Build capacity to produce tourism products in sustainable quantities	Facilitate formation of clubs/cooperatives			
11.	To encourage programs that enable people	Inventory of other potential income generating	Link community with other organizations that may be relevant	ZAWA/ NLCP/ CRB/ Other	On going	Short, medium & long term

	to have alternative sources of income	activities in the GMA	Build capacity to undertake such alternative activities	organizations		
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8.5 CULTURAL RESOURCES MANAGEMENT ACTIONS

During the consultative process with the community i.e. community workshops and community meetings, there were no heritage sites that were identified in the GMA. The only shrine where traditional rituals take place is at Marula Puku. This is the place where the people of Mukungule Chiefdom used to embalm and keep the remains of their chiefs for one year before burying them at, originally Shiwang'andu and later Bung'ongo burial sites. Hence this plan has not identified significant cultural resources in the GMA.

However, in case some sites are identified in future some cultural sites are identified, the following actions should be considered:

Table 10 Cultural Resources Management Actions

No.	Management Objective	Action	Activity	Who	Time Frame	Priority
1	To ensure the preservation of heritage resources while allowing access to the same by the local and international tourists for nature education and scientific purposes	To undertake desk/ field surveys to identify, record, evaluate and document cultural heritage resources Develop an up to date inventory of existing cultural heritage resources Carry out measures to conserve cultural heritage resources	To undertake desk/ field surveys to identify, record, evaluate and document cultural heritage resources Develop an up to date inventory of existing cultural heritage resources Carry out measures to conserve cultural heritage resources	NHCC/ NLCP/ CRB/ ZAWA ZAWA/ NHCC NHCC/ ZAWA/ NLCP	On going On going On going	Short, medium & long term Short, medium & long term Short, medium & long term
2	To promote and create awareness on the value and significance of cultural heritage	Produce informative literature on cultural heritage resources	Providing informative literature on cultural heritage resources	NHCC/ ZAWA/ NLCP	On going	Short, medium & long term

	resources					
3	To develop, promote and preserve cultural heritage sites and tourist attractions	Conduct awareness campaigns to local schools and other stakeholders	Conducting awareness campaigns to local schools and other stakeholders	NHCC/ NLCP/ ZNTB/ ZAWA	On going	Short, medium & long term

CHAPTER NINE

ENVIRONMENTAL CONSIDERATIONS

9.1 OVERVIEW

All types and kinds of developmental projects taking place in the protected areas (National Parks and Game Management Areas) of the country should be subjected to the conduct and preparation of Environmental Project Briefs (EPB's), Environmental Impact Assessments (EIA's), Environmental Audits (EA's) and Wildlife Impact Assessments (WIA's) reports depending on the nature and magnitude of the project in order to ensure sustainable tourism development prevail in the respective National Parks and GMA's. It is important that the conduct of EPB's, EIA's, EA's and WIA's is harmonized and well coordinated in order to ensure sustainable management and utilization of these areas and to guide and monitor implementation of developments taking place in these areas as stipulated in the Zambia Wildlife Act No. 12 of 1998 and the guidelines in the Environmental Impact Assessment Regulations (Statutory Instrument No. 28 of 1997) of the Environmental Protection and Pollution Control Act (EPPCA) No. 12 of 1990.

The EPB, EIA, EA or WIA report provides information on the potential positive and negative impacts and mitigation measures on the negative impacts that may arise due to the intended investment developmental activities taking place in the protected areas or GMAs. It is important that the EPBs, EIAs, EAs and WIAs be conducted and that impact assessments be carried out in consultation with ZAWA. Further the drawing up of the 'Terms of Reference' (ToR) upon which the assessments are based should also be done in with participation by ZAWA.

9.2 STRATEGIC ENVIRONMENTAL MITIGATION MEASURES

Based on the broad assessment of environmental aspects and project activities that are likely to be affected by tourism development during site preparation, construction and operational phases of the envisaged developmental projects within the GMA, the following mitigation measures and recommendations have been proposed.

9.2.1 Mitigation Measures and Recommendations due to Construction of a Community Camp Site in a GMA

The following are among the proposed mitigation measures and recommendations that the developer / proponent needs to comply with during the site preparation, construction and operational phases of such developments. It is the responsibility of the Park Manager to

ensure that the proposed measures are implemented for such types of developments in the GMA:

1. All the construction works should be done during the normal working hours of the day to avoid or to keep noise pollution that may disturb the animals, birds, insects etc in the locality of the project site, to the minimum level.
2. Site clearing should be based on the site plans to be approved by ZAWA in order to avoid cutting trees. The trees to be cut should not exceed 10cm diameter at breast height. Clearing should be strictly limited to the actual areas of development and access to these sites should be restricted along the cleared parts of the sites in order to minimize undue distraction of the surrounding areas of the site.
3. Extreme care should be observe in the movement of materials, light, heavy machinery and vehicles around the site in order to minimize the impacts of the materials, machinery and vehicles to the surrounding areas of the propose site.
4. The actual camping sites locality should be at least 50m away from the water frontage of any river system.
5. The ablution rooms/toilets should be constructed 61m away from the water frontage of any river system.
6. Designated footpaths should be established with minimum clearance of vegetation and these should not exceed 1m wide. Only under growth branches should be cleared and cut.
7. Site selection should be carefully done in order to avoid cutting down trees by choosing pockets of sites that are between trees, having both short and long term negative impacts to the ecosystem, cultural, historical, archaeological and surrounding environment of the proposed site.
8. At least three baboon proof dustbins with heavy lids should be mounted at some communal place of the camp site to carter for bottled and container waste, tins waste and biodegradable and burnable material waste. Mechanisms and modalities of disposing off the above mentioned wastes are the responsibility of ZAWA and the Community Camp Manager.
9. A site should be identified closer to the campsite where degradable material wastes should be burnt.
10. Site design should be such that designated roads are kept to a minimum

11. Leaflets guiding the tourists on how to sustainably stay at the camp should be produced and given to every client that comes to the site e.g. fire is not allowed except at designated localities, picking of firewood and flowers around the camp is not allowed; the introduction of exotic species is also not allowed, etc.

9.2.2 Mitigation Measures and Recommendations due to Establishment of a Safari hunting Camp

The following are among the proposed mitigation measures and recommendations that the developer / proponent needs to comply with during the site preparation, construction and operational phases of developing safari hunting camp. It is the responsibility of the Park Manager to ensure that the proposed measures are implemented whenever a safari hunting camp is being developed in the GMA:

1. All the construction works should be done during the normal working hours of the day to avoid or to keep noise pollution that may disturb the animals, birds, insects etc in the locality of the project site, to the minimum level.
2. Site selection should be carefully done in order to avoid cutting down trees by choosing pockets of sites that are between trees, not having both short and long term negative impacts to the ecosystem, cultural, historical, archaeological and surrounding environment of the proposed site.
3. The total area that should be allowed to for the construction o a bush camp should not exceed 2ha.
4. Site clearing should be based on the site plans to be approved by ZAWA in order to avoid cutting trees. The trees to be cut should not exceed 10cm diameter at breast height. Clearing should be strictly limited to the actual areas of development and access to these sites should be restricted along the cleared parts of the sites in order to minimize undue distraction of the surrounding areas of the site.
5. Extreme care should be observe in the movement of materials, light, heavy machinery and vehicles around the site in order to minimize the impacts of the materials, machinery and vehicles to the surrounding areas of the propose site.
6. Te proponent should as much as possible use local or nearby surrounding community labour for the construction of the hunting safari camp.

7. The actual hunting camping site's locality should be at least 50m away from the water frontage of any river system.
8. The ablution rooms/toilets should be constructed 61m away from the water frontage of any river system.
9. The structures of the hunting campsite should blend with the surrounding environment.
10. At least one baboon proof dustbin with heavy lids should be mounted at the campsite to cater for bottled and container waste, tins waste and biodegradable and burnable material waste. Mechanisms and modalities of disposing off the above mentioned wastes are the responsibility of hunting outfitter.
11. The proponent should not at all cost introduce exotic species and domesticated animals at the camp.

CHAPTER TEN

PROJECTION OF REVENUE AND EXPENDITURE FOR THE MUKUNGULE GMA

10.1 OVERVIEW

The projection of the revenue and expenditure for the period of three years has been done in order to show how much the Mukungule GMA can generate from the two proposed tourism activities namely a hunting block and the Natwange Campsite and how much will be required for the sustainable wildlife conservation in the GMA. It is difficult to project the precise revenue because there has not been commercial safari hunting before in the area for one to figure out the profitability of the block. It is also difficult to project the wildlife conservation costs in the GMA since the major component of the expenditure will be met through external funding support from the NLCP. This therefore makes the projection only a guide for managers to have an indication of the revenue and expenditure flows in the GMA in future.

10.2 EXPECTED REVENUE

This land-use plan will generate revenue from animal quotas and from the campsite. The revenue that will be earned by individual households through employment, sales of farm produce and all other sources are not included in the breakdown below. The revenue from animal quotas will be shared according to Part II of the Zambia Wildlife Act No. 12 of 1998 Section 5 (0) which states that “the Zambia Wildlife Authority shall pay out money into a fund established by the Community Resource Board from revenues payable under this act in respect of licences issued, concessions granted and services rendered from the use of wildlife resources within an area of the board as the Minister shall prescribe by regulations after consultations with the authority”. Currently, the existing sharing ratios are 45% CRB, 5% Chief, 40% ZAWA and 10% GRZ as per agreement during the national workshop for Chiefs and Community Representatives residing in Zambia’s GMAs held in 2002. The share of revenue for the CRB will be utilized in:

- Implementing community projects as will be agreed by the CRB in consultation with the rest of the community
- Supporting the activities of the CRB scouts i.e. buy uniforms, pay allowances, buy patrol rations etc.

- Support marketing mechanisms that will be aimed at expanding the tourism activities in the area

This land-use plan will be reviewed within three years from the date it is ratified and all commercial issues, which are based on the three-year life span, will be reviewed.

Financial Projections from Tourism

Table 12 gives the maximum number of tourist beds envisaged, the maximum number of guests to be accommodated, maximum number of bed nights, bed fee per night and envisaged total amount in an operational season for the Natwange community campsite.

Table 13 provides a summary of the possible revenue from animal quotas in the Mukungule GMA.

Table 12. Projection of Revenue from the Natwange Community Campsite

Name of Facility	Type of Facility	Status of Facility	No. Of Beds	No. Of Guests /night	Season in Days	Maximum Bed nights	Estimated Occupancy	Estimated Bed-nights	Charge per Bed (Us\$)	Total Income (US\$)
Natwange Community Campsite	Community Camping site	Existing	24	24	150	3,600	25%	900	5	4,500

Table 13. Possible Revenue from animal Quotas in the Mukungule GMA

Huntable Species	No. Per seasonal quota	Rate per trophy (US\$)
Eland		1,500
Sable		2,700
Roan		3,500
Reedbuck		300
Lion		2,750
Buffalos		1,000
Common Duikers		230
Impala		100
Total		

Table 14. Projection of Revenue in a Series of Three Years

Year	1	2	3
Projected Revenue (US\$)			
Annual Increase			

10.3 EXPECTED EXPENDITURE FOR MANAGEMENT AND DEVELOPEMNT OF THE GMA

The main area of expenditure for the CRB in the GMA would be support to the patrols through recruiting and paying the CRB scouts, buying uniforms, rations and other accessories. Expenditure for the ZAWA and NLCP Management would be to provide training to scouts, provide patrol leaders, transport requirements etc.

CHAPTER ELEVEN

IMPLEMENTATION PLAN

Plans are as good as actions they lead to. Many times plans fail to deliver the intended purpose. If a plan is to be implementable, there is need to ensure that:

- The plan identifies the resource implications of its proposals and the action needed from government, local communities and other stakeholders.
- The plan clearly identifies the roles and encourages self-sufficiency of the institutions involved.
- The plan is realistic in terms of what can be achieved within the available resources.

Before implementing the plan, it is necessary to prioritise and sequence the proposed actions in the plan and make an implementation plan for each action programme. During and after the implementation, monitoring and evaluation are required in the feedback system.

11.1 IMPLEMENTATION PRIORITY

The proposed management actions in relation to the respective management objectives and the management zones have been prioritised in order to efficiently and effectively implement the plan over a three-year period.

11.1.1 Natural Resources Management Action Priorities

First Priority

- Finalize formation of CRB
- The Ecologist to assist the community in coming up with bushfire management options
- Traditional set up to establish by-laws against late burning for Chitemene
- The traditional set up to establish by-laws against locating fields on river banks
- Effective law enforcement system put in place

Second priority

- CRB to recruit CRB scouts
- Monitor water quality in the rivers and streams of the GMA
- Monitor wildlife and vegetation
- Collect data on wildlife and vegetation
- Law enforcement on fish poisoning

11.1.2 Management and Operation Action Priorities

First Priority

- Officially designate Mukungule GMA as a hunting block
- Market and concession the hunting block
- Provide incentives for the law enforcement staff

Second priority

- Legalize the operations of the Natwange Community Campsite
- Empower the CRB through training in financial and business management
- Provide further training to the law enforcement staff

11.1.3 Local Community Management Action Priorities

First Priority

- Inventory of possible tourism attractions for the community
- Identify programs that can enable people to have alternative sources of livelihood security
- Conduct conservation awareness meetings with the local community
- Conduct environmental education in schools

Second priority

- Build capacity to undertake programs such as bee keeping, fish farming and gardening

11.1.4 Cultural Resources Management Action Priorities

First Priority

- Carry out measures to conserve the cultural heritage at Marula Puku Camp
- Undertake desk/field surveys to identify, record, evaluate and document cultural heritage resources that the community may not consider to be important

11.2 MONITORING, EVALUATION AND FEEDBACK

11.2.1 Monitoring

Monitoring will be done on a continuous basis and will be used to assess delivery, identify difficulties, to ascertain problem areas, and to recommend remedial actions. The purpose of monitoring is to ensure the efficient and effective implementation of the proposed management actions. Monitoring the implementation of the proposed actions will provide timely baseline for future land-use planning. The monitoring tools to be used will be the **proposed management action plan, the progress review of implementing the proposed management actions and the review of the land-use plan after three years**. The management actions indicate the management objectives, actions to be undertaken, activities to be carried out, by whom, time frame within which to carry out the activities from time of ratifying the plan and priority of the activities to be carried u and the progress review of implementing the proposed management actions and the land-use plan will be used to examine the actual implementation of the land-use plan for the GMA.

The proposed management action plan provides:

- The **actions** and **activities** described in relation to the **management objectives**
- Who should carry out the activity, time frame within which to carry out the activities from the time of ratifying the land-use plan and priority of the activities to be carried out?

The **progress review of implementing the proposed management actions** and the **land-use plan** will answer the following questions:

- Are inputs made available as prioritized?

- Are activities being carried out according to the proposed action plan?
- Are actions being implemented as prioritized?
- What changes have taken place, particularly, if any additions or deletions were made to the proposed management actions?
- What problems or difficulties have been encountered during the three years?
- What remedial actions have been taken or are planned?

11.2.2 EVALUATION

The implementation of the land-use plan will be evaluated by assessing the effects and impacts of the GMA performance, focusing on the analysis of the progress made towards the achievement of the proposed GMA objectives. Evaluation will be an essential function that will take place at one specific point in time in order to feedback into the GMA management and future direction of GMA planning, formulation and management.

Evaluation will be key tool for:

- Enhancing the management of implementing the land-use plan
- Improving the development of new management actions and
- Providing inputs into broader land-use management actions

Evaluation will be concerned with one or more of the following aspects of the land-use plan implementation performance:

1. **Effectiveness:** To what extent has the land-use plan achieved its objectives and reached its target groups?
2. **Efficiency:** Does the expected land-use plan results continue to justify the cost incurred?
3. **Relevance:** Does the land-use plan continue to make sense?
4. **Validity of design:** Is the design of the planning process leading to the preparation and production of the land-use plan document logical and coherent?
5. **Casualty:** What specific factors or events have affected the land-use plan results?

6. **Unanticipated Effects:** Is the land-use plan having an significant (positive and/or negative) effects which were not foreseen during the planning process?
7. **Alternative Strategies:** Is there or would there have been, a more effective way to address the problems, issues, concerns and achieve the objectives of the LUP.
8. **Sustainability:** What is the likelihood that the LUP benefits will be sustained on a long-term basis?

11.2.3 FEEDBACK

The proposed management action plan, the progress review of implementing the proposed management actions, the review of the LUP after three years and the self-evaluation reports will be the management tools that will be used to guide and document the work that relates to the implementation of the Mukungule Game Management Area Land-use Plan. Both the preparation of these reports and the follow-up actions to these reports will require dialogue and consultation with all stakeholders. Results of the evaluation of the plan will be fed back to the original plan. This process will provide counter measures to improve the situations and guide further management decisions. In case of unexpected circumstances in the future, which re significantly unsuitable with this plan, the process will allow the planning team to modify the plan. The LUP should be reviewed after three years from being ratified while the implementation of the management actions will be reviewed annually through the AMU annual review meetings where annual reports will be presented. Revised parts of te LUP, if any, will be recorded in the AMU annual work plan.

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Appendix I: Statutory Instrument No. 136 of 1998 of the Laws of Zambia.

Appendix II: List of Floristic Composition of the Vegetation in the Mukungule GMA (Smith, 1995)

Tall trees

Berchemia discolor (**Klotzsch**) **Hemsley**
Borassus aethiopium **Mart.**
Brachystegia boehmii **Taub.**
Brachystegia bussei **Harms**
Brachystegia glaberrima **R.E.Fr.**
Brachystegia glaucescens **Burt Davy & Hutch.**
Brachystegia longifolia **Benth.**
Brachystegia manga **De Wild**
Brachystegia microphylla **Harms**
Brachystegia spiciformis **Benth.**
Brachystegia utilis **Burt Davy & Hutch.**
Burkea africana **Hook**
Euphorbia ingens **Boiss.**
Ficus thonningii **Blume**
Isoberlinia angolensis (**Benth.**) **Hoyle & Brenan**
Julbernardia globiflora (**Benth.**) **Troupin**
Julbernardia paniculata (**Benth.**) **Troupin**
Parinari curatellifolia **Benth** subsp. *mobola* (**Oliv.**) **R. Grah.**
Periscopsis angolensis (**Baker**) **Van Meeuwen**
Pterocarpus angolensis **DC.**
Sterculia quinqueloba (**Garcke**) **K. Schum.**

Small trees

Albizia atunesiana **Harms**
Anisophyllea pomifera **Engl. & Brem.**
Annona senegalensis **Pers.**
Antidesma venosum (**E. Mey. ex**) **Tul.**
Azanza garkeana (**F. Hoffm.**) **Exell & Hillcoat**
Bersama abyssinica **Fresen** subsp. *paullionioides* **Verdc.**
Brachystegia allenii **Burt Davy & Hutch.**
Brachystegia stipulata **De Wild.**
Brachystegia taxifolia **Harms**
Bridelia cathartica **Bertol. f**
Cassipourea mollis (**R.E.Fr.**) **Alston**
Combretum collinum **Fresen** subsp. *Ondongensis* (**Engl. & Diels**) **Okafor**
Combretum collinum **Fresen** subsp. *suluense* (**Engl. & Diels**) **Okafor**
Combretum fragrans **F. Hoffm**
Combretum molle **G. Don**
Combretum zeyheri **Sond.**
Craterispermum schweinfurthii **Hiern**
Craterosiphon quarrei **Staner**
Dalbergia nitidula (**Welw. ex**) **Baker f**
Diplorhynchus condylocarpon (**Muell. Arg.**) **Pichon**

Faurea intermedia **Engl. & Gilg.**
Faurea saligna **Harv.**
Faurea speciosa **Welw.**
Garcinia huillensis (**Welw. ex**) **Oliv.**
Hexalobolus monopetalus (**A. Rich.**) **Engl. & Diels**
Hymenocardia acida **Tul.**
Lanea discolor (**Sond.**) **Engl.**
Lasianthus kilimandscharicus **K. Schum.**
Magnistipula butayei **De Wild.** Subsp. *Bangweolensis* (**R.E.Fr**) **F. White**
Maprounea africana **Muell. Arg.**
Maranthes floribunda (**Baker**) **F. White**
Marquesia macroura **Gilg**
Memycylon flavovirens **Baker**
Monotes africanus (**Welw.**) **A.DC.**
Monotes katangensis **DeWild.**
Monotes magnificus **Gilg**
Ochna gambleoides **Robson**
Ochna schweinfurthiana **F.Hoffm**
Ozoroa insignis subsp. *reticulata* (**E.G. Baker**) **J.B. Gillett**
Phyllocosmos lemaireanus (**DeWild. & Dur.**) **T. & H. Dur.**
Pseudolachnostylis maprouneifolia **Pax**
Ptercarpus tinctorius **Welw.**
Rourea orientalis (**Baill.**) **Baker**
Salacia rhodesiaca **Blakelock**
Securidaca longependunculata **Fresen.**
Strychnos cocculoides **Baker**
Strychnos innocua **Del.**
Syzygium guineense (**Willd.**) **DC.** Subsp. *huillense* (**Hiern**) **F. White**
Swartzia madagascariensis **Desv.**
Terminalia sericea (**Burch. ex**) **DC.**
Terminalia stenostachya **Engl. & Diels**
Uapaca kirkiana **Muell Arg.**
Uapaca nitida **Muell. Arg.**
Uapaca sansibarica **Pax**
Uvariastrum hexaloboides **R.E.Fr**
Vitex fischeri **Guerke**

Shrubs

Bridelia duvigneaudii **J.Leon.**
Canthium crassum now *Multidentia crassa* (**Hiern**) **Bridson & Verdc.**
Canthium huillense now *Psydrax livida* (**Hiern**) **Bridson**
Canthium lactescens **Hiern**
Canthium pseudorandii **Bridson**

Cassia singueana now *Senna singueana* (**Delile**) **Lock**
Catunaregam spinosa (**Thunb.**) **Tirven.**
Dichrostachys cineræa (**L.**) **Wight & Arn. Subsp. nyassana** (**Taub.**) **Brenan**
Diospyros kirkii **Hiern**
Diospyros lycoides **Desf.**
Dombeya rotundifolia (**Hochst.**) **Planch.**
Euclea racemosa **Murr. Subsp. schimperi** (**A.DC.**) **F. White**
Flacourtia indica (**Borm. F.**) **Merr.**
Indigofera rhynchocarpa (**Welw. ex**) **Baker**
Keetia gueinzii (**Sond.**) **Bridson**
Keetia venosa (**Oliv.**) **Bridson**
Kotschya strigosa (**Benth.**) **Dewit. & Duvign**
Kotschya strobilantha (**Baker**) **Dewit & Duvign**
Landolhia parvifolia **K. Schum.**
Maytenus acuminata (**L.f.**) **Loes.**
Maytenus buchananii (**Loes.**) **Wilezek**
Ochna leptoclada **Oliv.**
Ochna puberula **Robson**
Olax gambecola **Baill.**
Pavetta schumanniana (**F. Hoffm. ex**) **K. Schum.**
Phyllanthus discoideus now *Margaritaria discoidea* (**Baill.**) **G.L Wesster**
Premna senensis **Klotzsch**
Protea angolensis **Welw.**
Protea welwitschii **Engl.**
Psorosperum febrifugum **Spach**
Psychotria spithamea **S. Moore**
Rhus longipes **Engl.**
Rothmannia engleriana (**K. Schum.**) **Keay**
Rothmannia whitfieldii (**Lindi.**) **Dandy**
Tarenna neurophylla (**S. Moore**) **Brem**
Teclea rogersii **Mendonca**
Vangueriopsis lanciflora (**Hiern**) **Robyns**
Vernonia bellinghamii **S. Moore**
Vernonia glaberrima (**Wew. ex**) **O. Hoffin**
Vernonia suprafastigiata **Klatt**
Vitex madiensis **Oliv.**
Vitex mombassae **Vatke**
Ximения caffra **Sond.** *Subsp. natalensis*
Ziziphus mauritiana **Lam.**

Climbers

Amplocissus obtusata (**Welw. ex Baker**) **Planch.** *Subsp. kirkiana* (**Planch**)
Wild & Drummond
Strophanthus welwitchii (**Bailli**) **K. Schum.**

Grasses

Alloteropsis semialata (**R. Br.**) **Hitchc.**
Andropogon chinensis (**Nees**) **Merr.**
Andropogon gayanus **Kunth.**
Andropogon schirensis **A. Rich.**
Anthephora elongata **De Wild.**
Bewsia biflora (**Hack.**) **Goosens**
Brachiaria pungipes **W.D. Clayton**
Digitaria diagonalis (**Nees**) **Stapf**
Digitaria gazensis **Rendle**
Digitaria milanjjana (**Rendle**) **Stapf**
Digitaria nitens **Rendle**
Eleusine indica (**L.**) **Gaertn.**
Eragrostis racemosa (**Thunb.**) **Steud.**
Eragrostis castellaneana **Buscal & Muscht.**
Heteropholis sulcata (**Stapf**) **C.E. Hubbard**
Hyperrhenia filipendula (**Hochst.**) **Stapf** subsp. *filipendula*
Homozeugos eylesii **C.E. Hubbard**
Hyparrhenia variabilis **Stapf**
Leersia denudata **Launert**
Loudetia simplex (**Nees**) **C.E. Hubbard**
Melinis repens (**Willd.**) **Zizka**
Phacelurus huillensis (**Rendle**) **W.D. Clayton**
Pogonarthria squarrosa (**Roem. & Schult.**) **Pilg.**
Sacciolepis seslerioides (**Rendle**) **Stapf**
Schizachyrium sanguineum (**Retz.**) **Alst.**
Setaria homonyma (**Steud.**) **Chiov.**
Setaria orthosticha **Herrm.**
Sporobolus molleri **Hack.**
Sporobolus sanguineus **Rendle**
Trachypogon spicatus (**L.f.**) **Kuntze**
Trichopteryx fruticulosa **Chiov.**
Tristachya bequaertii **De Wild**
Tristachya hubbardiana **Conert**
Zonotriche inamoena (**K. Schum.**) **W.D. Clayton**

Appendix III. Consultation and Coordination

Authors

Marinah K. Sibbuku
Elsabe van der Westhuizen

Zambia Wildlife Authority
North Luangwa Conservation Project

Planning Team Members

Marinah K Sibbuku	:Planning Officer – ZAWA
Teddy Bwalya	:Area Warden – BAMU – ZAWA
Kamuti Simushi	:Senior Ranger – Mano Sector – ZAWA
Conrad Muzeta	:Livestock Development Officer – MACO
Stanslous Chilekwa	:District Planning Officer – Mpika District
Chiposo H. Musonda	:In Charge – Mpika District Forestry Dept
Patrick Mwape	:Chief's Representative

Workshop Facilitators

Marinah K. Sibbuku	:Zambia Wildlife Authority
Elsabe van der Westhuizen	:North Luangwa Conservation Project
Hammerskjoeld Simwiinga	:Agriculture Coordinator – NLWCCD
Maureen S. Mulenga	:Micro Entrepreneurship Officer- NLWCCD
Fannwel Muzengeza	:Extension Officer - ZAWA
Jones K. Masonde	:Wildlife Ecologist - ZAWA

Participants to the Community Workshops

Workshop held at Mukungule Middle Basic School 5 – 7th May 2004

Modesto Simfukwe	:Senior WPO – Mano Sector – ZAWA
Dextor Chilunda	:Senior WPO – Mano Sector – ZAWA

NKOMBA VAG
Davis Kangwa
Christopher Chilumba
Sterah Chileshe
Edward Kangwa
Loveness Bwalya
Paul Bwalya
Nsofwa Joseph

MUKUNGULE VAG
Patrick Mulenga
Mwila Chewe
Mathews Chibulu
Grace Samala

Stephen Mwila
Boston Kashita
Josephine Muyeleka
Chanda Davies

CHOBELA VAG
Kabamba Davies
Chilufya Fredrick
Kayumba Emmanuel
Bwalya Anthony
Malama Reginah
Mulenga Peter

CHISHALA VAG
Enerst Malama
Benson Kunda
Loveness Chewe
Christopher Mpelembe
Agness Mwila

Workshop held at Katibunga Middle Basic School 14 – 16th April 2004

KASHAITA VAG
Raphael Chikoti
Susan Katani Muchelenje

KATIBUNGA VAG
Bonface Chibulu
Wilbroad Mautelo
Smart Mutale
Tresphord Kangwa
Peter Chapatuka
Philip Kabuswe
Fabiano Mulenga
Nkuka Chewe

MWANSABAMBA VAG
Jackson Matipa
Enerst Chanda
Philimon Kasalu
Francis Kaluba
Amon Ng'ambi
Moses Chilangu
CHIPUNDU VAG
Musakanya Kabwe
Sebio Bwalya
Friday Chinkalanga
Mary Bwalya

Martha Kolala
Simon Kapasa
Lawrence Chiluba

KALUBA VAG
Shadreck Kaluba
Lawrence Shawa
Nsofwa Joseph
Gradwell Jonas Kabuswe
Joyce Mulenga
Mathews Chilangu
Dickson Kabuswe