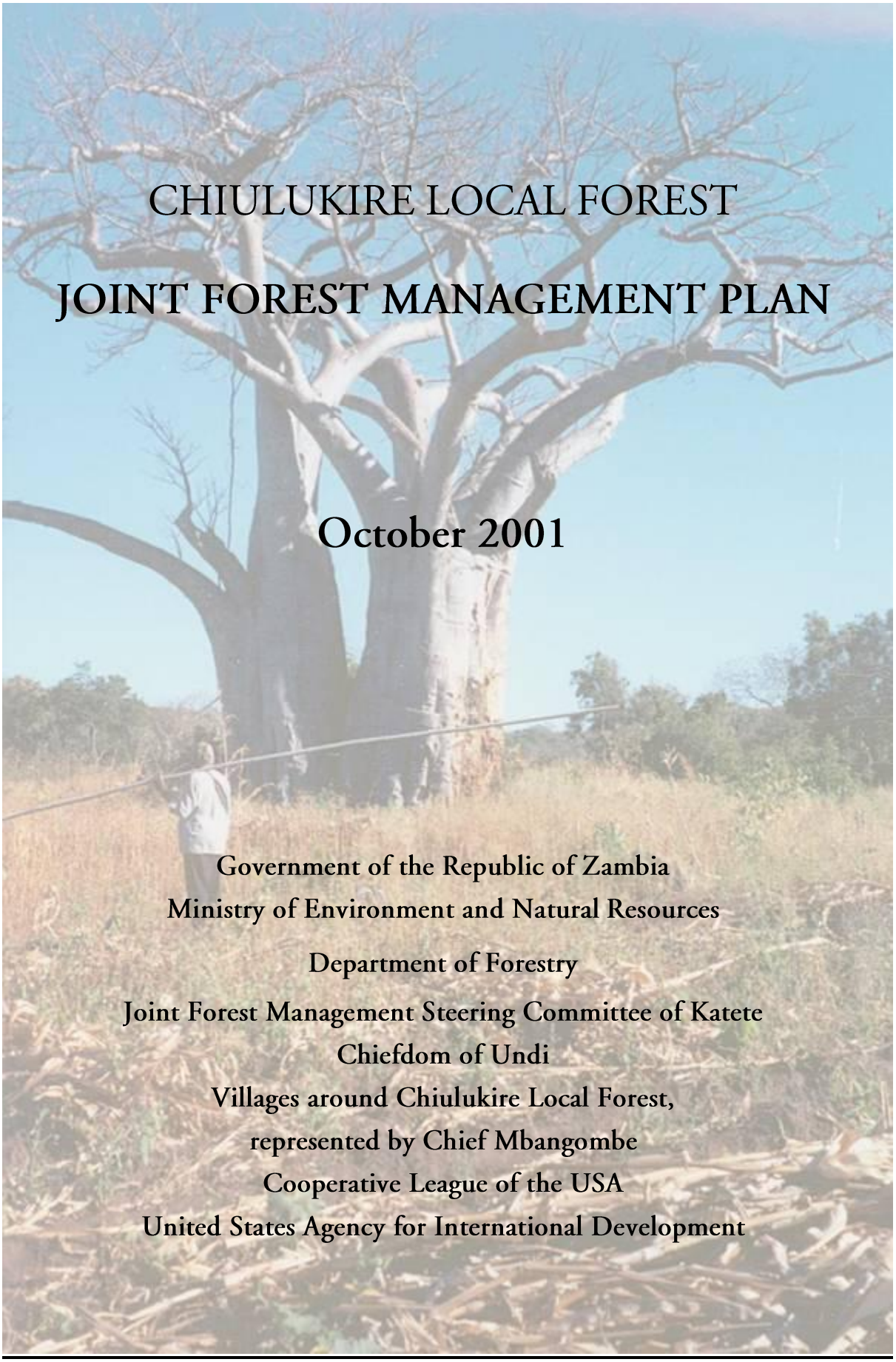


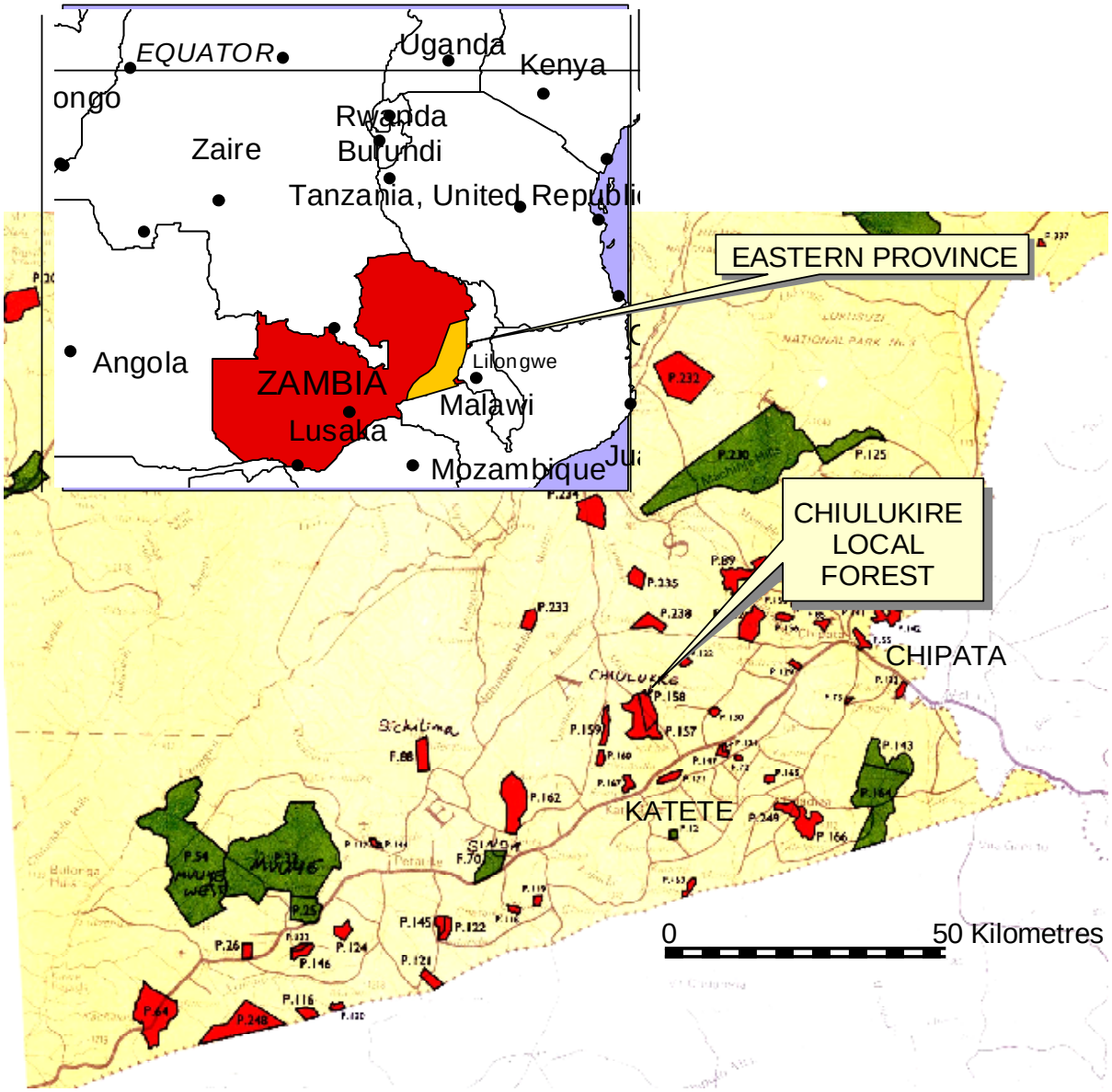
CHIULUKIRE LOCAL FOREST

JOINT FOREST MANAGEMENT PLAN

October 2001

Government of the Republic of Zambia
Ministry of Environment and Natural Resources
Department of Forestry
Joint Forest Management Steering Committee of Katete
Chiefdom of Undi
Villages around Chiulukire Local Forest,
represented by Chief Mbangombe
Cooperative League of the USA
United States Agency for International Development

VICINITY MAP OF CHIULUKIRE LOCAL FOREST



PREFACE

Overuse and degradation of forest resources and waters are threatening woodlands in Eastern Province. Increasing population pressure for agricultural land and a perception that the forest will never end are some of the main causes of the destruction of trees and soil. People look to forests for survival and yet do not realize that insurmountable damage is being done to them.

These days, thanks to sensitization by the Forestry Department and NGOs, rural communities are beginning to understand and appreciate that the forest resource use must be regulated. Accordingly, the focus in resource management is beginning to change. The resource users are being reminded to adopt more sound management practices.

The Forestry Department's revised National Policy of 1998 and Forest Act of 1999 laid out strategies and guidelines that enable communities and government to practice Joint Forest Management in Zambia. The concept of Joint Forest Management is a move away from the usual police-oriented approach of Forestry Department, toward sharing responsibility for properly-controlled and sustainable product harvest with local communities. It also allows direct sharing of monetarybenefits between government, traditional authorities, and village structures. The people around Chiulukire Local Forest in Katete have agreed to join hands with the government in a pilot effort to jointly manage Chiulukire Forest under the new Policy and Act on a sustainable basis. The Cooperative League of the United States of America (CLUSA) has been facilitating this Community-Based Natural Resource Project in conjunction with the Ministry of Environment and Natural Resources.

The overall objective of CLUSA's programme, which includes an overarching agricultural component, is to improve the economic well-being of rural populations living around managed forest reserves. In Eastern Province, the programme seeks to establish partnerships between stakeholders around selected forest areas. Chiulukire, the first pilot site, lies in Chief Mbang'ombe's area under Undi's kingdom.

CLUSA's strategy is to start by reducing pressure for land to be encroached from gazetted forests which are usually viewed as agricultural expansion areas by farmers. Pressure is reduced by the introduction of conservation farming, cash crops, and value adding. Another part of the strategy is to facilitate information exchange between Forestry Department and the villages on issues and planning. Transfer of organizational skills and financial management to village groups is CLUSA's specialty. Functional literacy and AIDS education complement the package delivered to the field. Finally, Forest Department receives technical training and logistical support as needed for field-based operations. It is recognized by all that even though laws are sound and personnel are willing, often it is simply a matter of logistics that prevents proper surveillance of forest resources.

The management plan may be characterized as follows:

- ⇒ *It is **dynamic**, with annual evaluations and recommendations built into it, so that conditions on the ground will determine allowable actions.*
- ⇒ *It is a result of over **two years of dialogue** with forest users and their leaders in formal and informal settings.*
- ⇒ *It should be used as a **guiding tool** in the management of Chiulukire Local Forest. Rich technical information from many researched and interviewed sources is contained within.*
- ⇒ *Before implementation, it is planned that various user groups are to be formed and **sensitized on ecological and economical aspects** of harvesting.*
- ⇒ *The strategies contained in each chapter, if followed, will contribute to the **sustainable utilization** of Chiulukire Local Forest for the benefit of current and future generations of plant, animal, and human life.*

SIGNED,

_____	_____	_____
CHIEF MBANG'OMBE	FORESTRY DEPARTMENT	KATETE DISTRICT COUNCIL

CHIULUKIRE LOCAL FOREST
JOINT FOREST MANAGEMENT PLAN

October 2001

SECTION I. CONTEXT FOR JOINT FOREST MANAGEMENT 1

LEGAL BASIS 2

COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT PROGRAMME IN EASTERN PROVINCE 2

CLUSA APPROACH TAILORED TO ZAMBIA 3

PURPOSE AND DURATION OF THE PLAN 4

SECTION II. DESCRIPTION OF THE FOREST AND ITS PEOPLE

MANAGEMENT AREA DESCRIPTION 6

TOPOGRAPHY, VEGETATION, SOILS, CLIMATE 7

FIELDS IN THE FOREST 7

VILLAGE ORGANIZATION, LITERACY, AND ECONOMIC ACTIVITIES ... 7

LAND TENURE AND USAGE RIGHTS 11

BRIEF SETTLEMENT HISTORY OF THE FIVE VILLAGE RESOURCE MANAGEMENT AREAS 12

ORIGINAL REASONS FOR RESERVATION AND OBJECTS OF MANAGEMENT 13

GOOD AND BAD FOREST 14

SECTION III. OBJECTIVES AND STRATEGY 15

DEVELOPMENT OBJECTIVE 15

GENERAL OBJECTIVES 15

GENERAL STRATEGY 16

SECTION IV. ACTIVITIES CONTROLLED BY THE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES (VRMACs)

BAMBOOS *20*

BARKROPE *22*

BOUNDARY RECOGNITION *24*

CARVING TREES *25*

CATERPILLARS *27*

CHARCOAL TRIALS *29*

CUTTING METHODS: GENERALITIES *34*

FIELDS AND SETTLEMENTS IN THE FOREST *36*

FIRE MANAGEMENT *39*

FIREWOOD *41*

FISHING *42*

FRUIT TREES *44*

GRAZING *47*

HONEY AND BARKHIVE PRODUCTION *50*

MEDICINAL PLANT PARTS *55*

MUSHROOMS *57*

POLES FOR CONSTRUCTION *60*

RESERVED AREAS *62*

SAWTIMBER *65*

CALCULATION OF ANNUAL ALLOWABLE CUT *66*

SUNDE BROOMS *73*

THATCHING GRASS *79*

WATERCOURSE MANAGEMENT *80*

WILDLIFE *83*

SECTION V. ADMINISTRATIVE ASPECTS 85

THE FIVE VILLAGE RESOURCE MANAGEMENT AREAS (VRMAS).....86

THE FIVE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES (VRMACS).....86

1. COMPOSITION OF THE VRMAC 86
2. GENERAL ROLES OF THE VRMAC.....86
3. ELECTION OF VRMAC MEMBERS.....88
4. VRMAC TENURE OF OFFICE 88
5. VRMAC MEETINGS 88
6. VRMAC REPORTING 89

FINANCIAL MANAGEMENT.....90

1. PERMITS FOR CHIULUKIRE FOREST PRODUCTS.....90
2. STORAGE AND DISTRIBUTION OF FOREST PRODUCT PERMITS.....95
3. REVENUE COLLECTION, TRANSMITTAL, AND BANKING 95
4. REVENUE SHARING.....95
5. FINANCIAL RECORDKEEPING.....96
6. AUDITING.....97
7. MISAPPROPRIATION OF FUNDS 97

IMPLEMENTATION OF THE MANAGEMENT PLAN 98

1. ROLE OF TRADITIONAL AUTHORITIES.....98
2. ROLE OF THE FOREST DEPARTMENT.....98
3. ROLE OF THE JOINT FOREST MANAGEMENT COMMITTEE.....99
4. ROLE OF THE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES.....99
5. ROLE OF THE VILLAGE RESOURCE GUARDS 100
6. ROLE OF CLUSA AND OTHER NGOS.....101
7. ROLE OF USER GROUPS 101

SECTION VI. EVALUATION AND MONITORING 102

MONTHLY, QUARTERLY, AND YEARLY ACTIVITIES..... 103

1. MONTHLY REQUIREMENTS.....103
2. QUARTERLY REQUIREMENTS.....104
3. YEARLY REQUIREMENTS 105

YEAR-BY-YEAR WORK AND MONITORING ACTIVITIES..... 107

APPENDIXES:

SCIENTIFIC AND LOCAL NAMES OF TREES FOUND IN CHIULUKIRE FOREST page 108

BOUNDARY DESCRIPTIONS OF CHIULUKIRE EAST AND WEST page 111

FOREST INVENTORY DESCRIPTION, TABLES, AND CHARTS page 113

SECTION I. CONTEXT FOR JOINT FOREST MANAGEMENT

LEGAL BASIS

CLUSA IN EASTERN PROVINCE

CLUSA APPROACH TAILORED TO ZAMBIA

PURPOSE AND DURATION OF THE PLAN

LEGAL BASIS

Following its creation in 1991, the Ministry of Environment and Natural Resources (MENR) was assigned three primary goals:

(1) Protection, conservation and restoration of the full range of biological and physical diversity in Zambia;

(2) Maintenance and restoration of the quantity and quality of land, water and air to support the health of humans and all living things; and,

(3) Provision of social and economic opportunities for the people of Zambia in keeping with the responsibility of maintaining a diverse and healthy environment.

During the process of formulating the new Forest Policy, it was pointed out that one of the main problems with the old policy was the lack of provisions for the Forest Department to "reach out" to local communities as viable stakeholders and partners in the management of the country's forests. In response to this, the new policy set forth clear guidelines to: "ensure adequate protection of forests, by empowering local communities and promoting the development and use of forest and non-wood forest products." Furthermore, "all key stakeholders particularly local communities must be involved in the management of the forests and forest products."

Following the formulation of the policy, work began to revise the Forest Act of 1973: "to incorporate ideas of joint forest management and facilitate the participation of local communities, traditional institutions, non-government organizations and the private sector."

Thus, in October 1999, the President of the Republic of Zambia signed the new Forest Act, No. 7 of 1999 into law.[1] With regard to joint forest management the new law states that: The Minister may, on the recommendation of the Commission, local community or owners or occupiers of an area in a forest, declare by statutory instrument any Local Forest, forest plantation or open area, a Joint Forest Management Area" (PART V, Chapter 25(1)). The new act clearly opened the door to local communities to participate as legally recognized partners with the Forest Department in the management and revenue sharing of open and local forests.

COMMUNITY-BASED NATURAL RESOURCES MANAGEMENT PROGRAMME IN EASTERN PROVINCE

In response to the favorable change in Zambia's Forest Policy, the United States Agency for International Development (USAID) initiated discussions with the MENR regarding development assistance in the sector. The result was the signing of a cooperative agreement between USAID and the Cooperative League of the United States of America (CLUSA) for the implementation of a five year project, Community-Based Natural Resources Management (NRM) in Eastern Province which began in 1999.

Based on CLUSA's experience in natural resource management in other regions of Africa, the five year program will demonstrate, in the Zambian context, an approach to community-based forest management that has proven successful in West Africa. The overall goal of the program is to improve the economic and social well-being of Zambia's rural population. Its purpose is to strengthen

[1] Although the new Forest Act has not been activated as of June 2002, the current act was amended through Statutory Instrument 52, providing the necessary legal framework for Joint Forest Management to move forward until the new Forest Act is activated.

community groups and group-based enterprises in the target areas by helping them to acquire the skills and knowledge they need to improve their living standards and their general economic situations.

CLUSA-CBNRM is now working in four Districts: Mambwe, Chipata North, Katete, and Petauke. The first forest selected as a pilot undertaking is the Chiulukire Local Forest, Katete District.

CLUSA APPROACH TAILORED TO ZAMBIA

The main difference between community-based management approaches employed in Zambia and West Africa is that in Zambia, the forest management is preceeded by establishment of an agricultural outgrower scheme. The objectives of the outgrower scheme are:

- to introduce improved farming technologies to increase yields;
- to assist with credit for inputs;
- to improve marketing by focusing on high-value cash crops, thereby raising incomes; and ultimately
- to reduce the pressure on the natural forest.

Moreover, the outgrower scheme is a means to draw attention to the natural resource management programme in a very practical manner and respond to farmers' priorities in a subject about which they know the most: agriculture.

Once the outgrower scheme is underway, the steps to community-based forest management include the following:

1. **Preparation for the formulation of the Joint Forest Management Plan (JFMP)**: this phase includes training of stakeholders; initial discussions; village resource assessments; forest mapping; forest inventory; and demarcation of forest management areas. These steps have already been taken for Chiulukire Local Forest in 1999 and 2000.
2. **Formulation of the Joint Forest Management Plan (JFMP)**: Following the preparation phase, all of the stakeholders (village representatives, traditional authorities, representatives from the Steering Committee, the Forest Department, and concerned NGOs) were convened to participate in workshops in November 2000 and May 2001 to develop the first draft of the JFMP. Following circulation of the draft to the stakeholders accompanied by explanation of content, a second workshop was held to compile all concerns and comments for improvement. Revisions were made and a second draft was again circulated for comments. The JFMP is to be finalized and sent to the Ministry level and the local authorities. If accepted, the forest is gazetted as a Joint Forest Management area with all the pertaining legal status.
3. **Implementation of the Joint Forest Management Plan**: The primary responsibility for the implementation of the FMP falls on the Village Resource Management Area Committees (VRMACs), which are responsible for assuring that their respective management areas abide by the laws and policies described in this JFMP (see Section V on specific activities and Sections VI and VII on administration and monitoring). The Forest Department and CLUSA will collaborate to ensure that all necessary training is given to members of the committee and forest user groups. The Forest Department is responsible for ensuring that the JFMP is implemented according to the law. CLUSA will facilitate the feasibility studies and training of user groups to promote forest-based industries.
4. **Monitoring and evaluation:** The JFMP will be monitored periodically using indicators described in Sections V and VII as criteria for success. The monitoring will be carried out primarily by the rural communities and the Forest Department. The Steering Committee will be responsible for organizing an annual evaluation of the program.

PURPOSE AND DURATION OF THE PLAN

1. Purpose

The purpose of the management plan is to define the laws and policies that will guide the rural communities and the Forestry Department during exploitation of the natural resources of the Chiulukire Forest for the benefit of the local population in a sustainable manner. Once adopted and gazetted, the plan will serve as a legal contract between the rural communities and the MENR granting user rights to the communities in exchange for their cooperation in the long term conservation and management of the forest.

2. Duration and the need for regular adjustments

The duration of the JFMP is ten years. In theory, this means that ten years from the date that the plan if gazetted, a new plan should be formulated. In practice, however, because of the novelty of joint forest management in Zambia, and the need to be flexible and adjust from lessons learned, the plan may be adjusted every year during the first few years of implementation. *In other words, the plan is dynamic, and lessons learned should be incorporated as they become obvious.* Conditions for changing harvest quotas are described in Section VI on monitoring.

Workshops, such as this one held in Chipata in November 2000, are a good way to bring stakeholders together to discuss issues and to plan.

SECTION II. DESCRIPTION OF THE FOREST AND ITS PEOPLE

MANAGEMENT AREA DESCRIPTION

TOPOGRAPHY, VEGETATION, SOILS, CLIMATE

VILLAGE ORGANIZATION, LITERACY, AND ECONOMIC ACTIVITIES

LAND TENURE AND USAGE RIGHTS

BRIEF SETTLEMENT HISTORIES OF VILLAGE REGIONS

GOOD AND BAD FOREST

MANAGEMENT AREA DESCRIPTION

LEGAL STATUS: Chiulukire East and West were gazetted as Local Forests in 1966 on Gazette Number SI.263/66. Chiulukire East Local Forest Number P.158 has 5,403 hectares while Chiulukire West Local Forest Number P.157 has 6, 637 hectares according to the Gazette Number SI.263/66. For purposes of this management plan, the two Chiulukire Local Forests are considered together as "Chiulukire Local Forest". Chiulukire East and West Local Forests combined contain about 10,800 hectares of mostly miombo woodland according to year 2000 geographic information system calculations; actual locations of boundary markers are to be completed in the first year of the plan. The original proposal stated that the area was a total of "29,850 acres", or 12,085 hectares.

ACCESSIBILITY: The forest is located 20 kilometers north of Katete (Eastern Province) with two good access roads, one on the west side and one on the west, that connect to the Great East Road. The distance from Chipata to Chiulukire Local Forest is about 70 kilometers. Katete and Chipata are the two large towns that are market centers for many of the forest's products.

AGRICULTURAL ACTIVITY: Farming is the most widespread activity. The region is good for groundnut and cotton production. Cash cropping of sunflower and paprika of superior quality has been initiated by CLUSA in the surrounding villages. Conservation farming for all these crops has been the object of innovative extension work with CLUSA farmers since 1999.

Pressure on the forest for agricultural land is increasing greatly due to rapid population increase: the 1970 government map showed only about 10 villages in the area immediately surrounding the forest, while now more than 75 villages comprised of over 1,000 households have been recorded. Two neighboring smaller forest reserves to the west have already been more seriously encroached than Chiulukire; it is difficult to find their boundaries on the 1999 satellite photo. However, Chiulukire is relatively "intact" and remains an important source of natural resources to the surrounding population. As of year 1999, about 940 hectares or 9% of the forest is under cultivation. The area was calculated by tracing polygons of fields visible on the satellite image and calculating the cumulative area using the GIS.

ECONOMIC POTENTIAL: The highest-valued resources remaining include a stone-age rock painting area, some small game and a few big cats, a few sawtimber and rare trees, and some year-round water points. There is enormous potential in many nontimber products found there.

USE OF FIRE: A COMMON PROBLEM

One of the principal management problems today, common to all the management areas, is that of fire misuse. Many villages noted that in the past Village Headmen were informed by the Chief of the period during which fires could be started to clear grass and to hunt: usually May/June in some parts of the forest, and October/November in other parts (grazing areas) to allow fresh grass to grow. This system is no longer in place, and fires that are lit during the hottest driest months of August to October (lit mainly by hunters and children hunting mice) cause unnecessary damage to seedlings and harvestable forest products. It is said also that fires drive more wildlife away now than before. Only fires close to villages or fields are controlled or snuffed with tree branches. Fire therefore has cut across the boundaries of many management issues.

TOPOGRAPHY, VEGETATION, SOILS, CLIMATE

The forest sits on the plateau of Eastern Province with altitudes ranging from 900 to 1,200 meters. The landscape is broken by rocky hills, especially in the south, where well-forested moderate slopes lead to the higher summits.

The vegetation of the hilly areas is miombo woodland dominated by *Brachystegias* and *Julbernardias* among others. The northern part of the forest contains some mopane woodland dominated by *Colophospermum* on gentler slopes. Munga woodland is scattered throughout the forest dominated by *Acacia*, *Combretum, Lannea,* and other species. Trees larger than 50 centimeters in diameter, and taller than 15 meters, are rare in the forest. Some of the scattered stands of gregarious *Brachystegia bussei* are the largest and most concentrated areas of wood.

Soils are mainly brown sandy loam with quartz stones and gravel in the topsoil (from original reservation proposal 195_). Some sandy areas are found in low areas and dambos.

Average annual rainfall is between 600 and 1000 millimeters, falling mostly between December and March. Coldest months are June and July (15-18 degrees mean temp.); warmest are September and October (mean temp. 21-26 degrees).

FIELDS IN THE FOREST

About 940 hectares of the forest (8.7%) is under cultivation. (See map in Section IV Fields and Settlements chapter.) Cotton and groundnuts are the main cash crops grown inside the forest; cotton is known as the most destructive in terms of requirements for newly-cleared forest land and use of pesticides harmful to bees and honey production. Maize is mainly grown for home consumption. All sides of the forest are affected with scattered fields and settlements inside forest boundaries. One key to successful management of this forest will be the control of these fields to prevent further destruction of forest land.

VILLAGE ORGANIZATION, LITERACY, AND ECONOMIC ACTIVITIES

1. VILLAGE ORGANIZATION INTO RESOURCE MANAGEMENT AREAS

There are more than 75 villages around the forest. Locations were registered by GPS and satellite imagery on maps produced by Cooperative League of the USA (CLUSA) that accompany this report.

The first table summarizes Village Resource Management Area (VRMA) populations of villages that filled out a questionnaire presented by CLUSA facilitators and village resource assistants in 1999. The populations given by the villagers themselves do include children. "Village" sizes range from 8 persons to over 500 persons.

The population around the forest is more than 5,000 persons as of 1999, when a Village Resource Assessment was completed in the area (see Table 1 which shows populations of villages interviewed). The population of villages and settlements inside the boundary is around 500 persons.

For purposes of being served by CLUSA facilitators and for organization into future resource management areas, each village is assigned to one of five VILLAGE RESOURCE MANAGEMENT AREAS (VRMAs). Their names are:

- CHINKHOMBE (Nthambwa-Musonda, Tontholani, and neighbors southwest of Chiulukire)
- MAGOBO (Kazika and neighbors north of Chiulukire; also KASAMANDA area in northwest corner)
- MATUNGA (Gaveni, Kazembe, and neighbors east of Chiulukire)
- MKAIKA (Agasi, Chipilingu, and neighbors south of Chiulukire)
- ZINAKA (Ndelemani and neighbors northwest of Chiulukire)

2. INFORMATION GATHERED FROM 1999 INTERVIEWS

A participatory village resource assessment (VRA) was carried out in several villages around the forest in 1999. The following information pertains to the summary of findings contained in the report from these interviews. IT IS RECOGNIZED THAT THE ENTIRE POPULATION IN THE AREAS COVERED IS NOT REPRESENTED IN THESE 46 VILLAGES. It has been stated that at least 75 villages are around the forest area, most of them smaller than the 46 interviewed in 1999. However, the interviewed villages provide a good cross-section of the activities and composition of the area.

TABLE 1. POPULATIONS, LITERACY, AND MIGRATION IN VILLAGES INTERVIEWED

MGMT AREA *(No. of villages)*	*Population represented*	Households headed by		*Number literate*		*Migration per year*
		Male	*Female*	*Males*	*Females*	
Chinkhombe (7)	1148	202 (78%)	59 (22%)	165	96	6 out
Magobo (11)	434	103 (61%)	67 (39%)	47	24	5 in; 1 out
Matunga (11)	1860	163 (74%)	58 (26%)	74	34	5 in
Mkaika (6)	637	102 (79%)	27 (21%)	38	16	NONE
Zinaka (11)	775	178 (86%)	29 (14%)	105	54	1 in; 2 out
TOTAL (46 vill)	***4854***	***748***	***240***	***429***	***224***	***11 in; 9 out***

MIGRATION: On balance, the migration trends are not changing population much around the forest; however, Chinkhombe is susceptible to emigration and Matunga to immigration. The number of persons seeking seasonal work elsewhere is very low.

LITERACY AND MATRIARCHY: Because the populations are not broken down by age group, it is difficult to estimate the percentage of literacy among school-age and older persons. If the total population of 4854 were divided into family units of 2 parents plus 1 grandparent plus 4 children = 7 persons, of which perhaps 4 are old enough to be literate, then we would expect nearly 3000 to be literate. The actual literate total is 653, which could then indicate a theoretical level of fewer than 25%.

The importance of literacy to management of the forest is principally for bookkeeping and marketing. CLUSA is continuing in its functional literacy program targeting village adults. It is fortunate to have as partners in management the Forest Department personnel; they are there to help bridge the gap in literacy for necessary translations and trainings.

In each area there are close to twice as many males as females qualifying as literate, even in Magobo (Kazika village area) where 39% of the households are headed by women.

VILLAGE OCCUPATIONS: The next table describes various occupations of villagers according to the 1999 survey. All the households represented are engaged in farming as one occupation, so farming is not mentioned on the list. The information is also portrayed on accompanying maps.

TABLE 2. ECONOMIC ACTIVITIES OF VILLAGES AROUND CHIULUKIRE

	NUMBER OF HOUSEHOLDS WITH THIS OCCUPATION					
OCCUPATION	**CHINKHOMBE** (1148 = population in 7 villages)	**ZINAKA** (775 = pop. in 11 villages)	**MAGOBO** 822* = population	**MATUNGA** (1860 = pop. in 11 villages)	**MKAIKA** (637 = pop. in 6 villages)	**TOTAL (5242 pop. in 46 vgs)**
Sawyer	15	37	11	13	7	***83***
Carpenter	2	13	8	6	9	***38***
Beekeeper	36	54	71	44	25	***230***
Broomtrader	2	20	17	32	5	***76***
Basketweavr	43	36	15	19	10	***123***
Herbalist	1	5	0	13	2	***24***
(Distance to forest bound.)	**2 to 7 kilometers**	**0 to 6 kilometers**	**0 to 2.8 kilometers**	**1.5 to 3 kilometers**	**3 to 7 kilometers**	
Blacksmith	12	38	9	7	7	***66***
Brewer	16	11	10	38	24	***99***
Bricklayer	5	3	3	27	1	***9***
Gardener	0	0	9	28	34	***71***
Grocer	7	3	0	9	2	***21***
Handicraft	19	24	0	10	26	***79***
Potter	1	11	4	16	9	***41***
Other	Radio repair 3 Bike repair 1 Health worker 1		Radio rep. 1 Bike repair 2 Health wrkr 4	Radio repair 3 Bike repair 16	Community worker 1	

Magobo registry of yeara 1999 has recorded 822 people in the Magobo area covering the part under authority of Chief Mbang'ombe. The 1999 Village Resource Assessment covered interviews with villages representing 434 people in 11 villages. Magobo was the only region to update published results of the VRA report.

If one focuses on those activities that depend on Chiulukire forest cover (shaded portion of table 2), beekeeping is a big occupation on all sides of the forest but particularly in the west and north (Chinkhombe and Magobo). Sawing, carpentry, and basketweaving are also important in those areas.

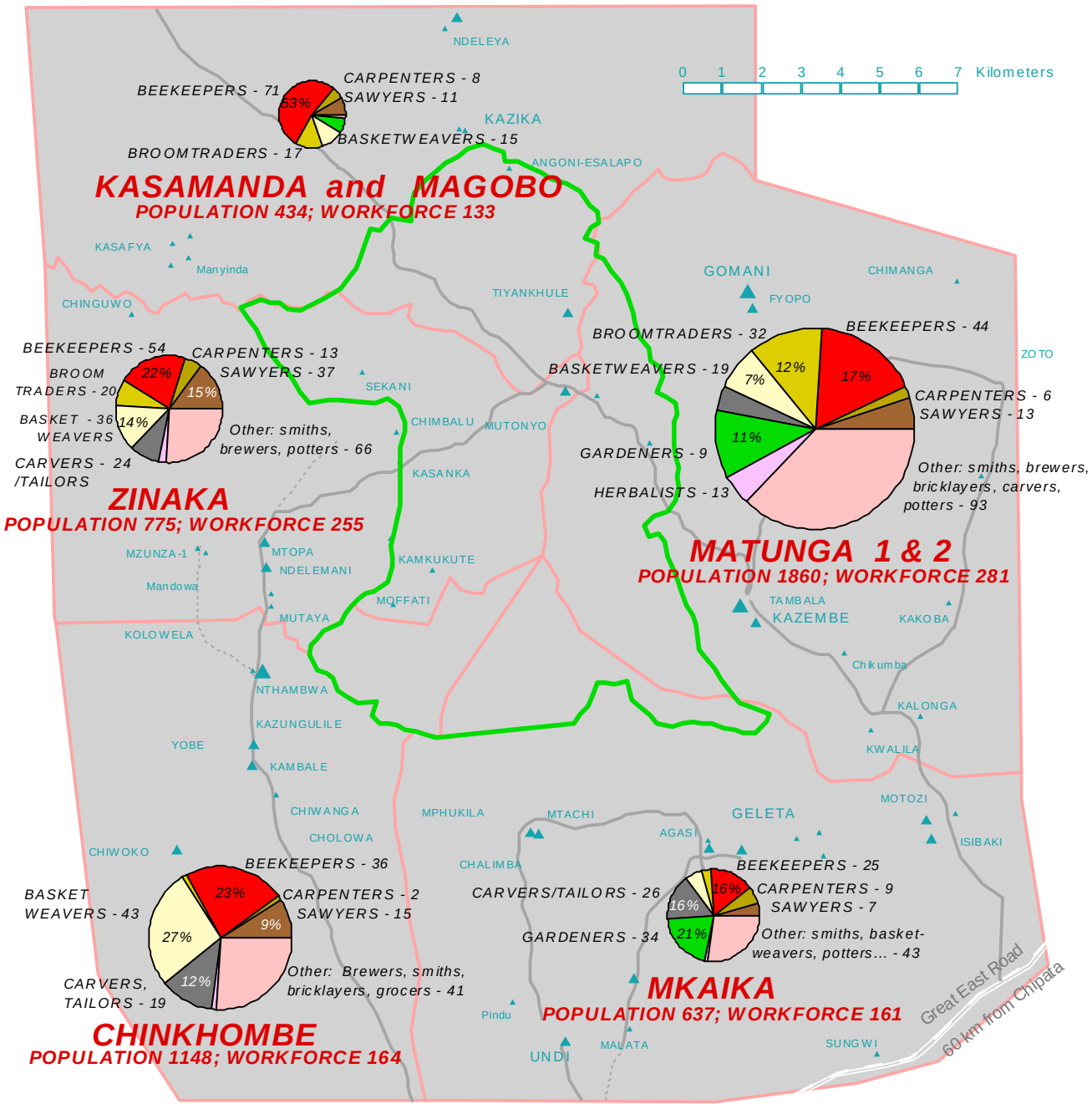
GRAZING: *he* following table describes the abundance of primary livestock recorded on village survey sheets.

TABLE 2. LIVESTOCK CLAIMED BY VILLAGES AROUND CHIULUKIRE FOREST

Head of:	CHINKHOMBE (7 villages)	MAGOBO (11 villages)	MATUNGA (11 villages)	MKAIKA (6 villages)	ZINAKA (11 villages)	**TOTALS (46 villages)**
Goats	2345	539	220	461	1655	**5220**
Cattle	198	133	156	154	120	**761**
Pigs	162	56	146	143	69	**576**

CHIULUKIRE LOCAL FOREST VILLAGER OCCUPATIONS

from November 1999 village resource survey



OCCUPATIONS BY MGMT AREA

Forest bound

Mgmt Area bound

Villages, populations
- 1 - 100
- 101 - 200
- 201 - 600

Roads

PIE CHART LEGEND
- Sawyer
- Carpenter
- Beekeeper
- Broomtrader
- Basketwvr
- Handicraft
- Gardener
- Herbalist
- Other (especially brewers and smiths)

LAND TENURE AND USAGE RIGHTS

1. HISTORY OF STATE LAND

During the colonial era land was divided into Trust land, Reserved land and Crown land. These are now called Traditional and State land, respectively. The recognition by the traditional chief that control of some forests was being ceded to the State happened around 1955 to 1958 (depending on the village describing the process). However, in some cases the bordering villages did not learn of the Forest Department taking over responsibility for the forest until the 1960s (see VRA report, 2000).

2. TRADITIONAL LAND AND CONFLICT RESOLUTION

According to the original reservation proposal E.93, the Chiulukire is "in Chief Mbang'ombe's area partly in Native Trust Land XXIV and partly in Zumwanda Native Reserve IV and comes under the Chewa Native Authority."

Traditional land, which covers 96% of the land in Eastern Province, may be occupied according to customary law without a formal right assigned to the land. The traditional chief, in this case Chief Mbang'ombe, whose palace is not far from Katete, controls such land. (The Paramount Chief of the Chewa tribe, Gawa Undi, has a village just to the south of the forest. Chief Mbang'ombe is just below Undi in rank, a senior chief.)

Individuals can apply for land title deed to the Commissioner of lands with written consent from the Chief. The Chief has a traditional council, which advises on governance and other issues affecting the chiefdom.

The Senior Chief's Village Headmen are his representatives who are authorized to allocate land locally, resolve disputes, and preside over traditional ceremonies. They also have power to grant permission to cut a tree around the village, where normally this act is forbidden and even punishable because such trees are supposed to control wind and water erosion. It is taboo to cut trees and collect mushrooms and fruits from a graveyard.

When local villagers are involved in a dispute, they begin at the most local level, the Village Headman, to attempt to resolve it. If this fails, they take it to a local traditional court called Khonde. Again if it fails they go to the Senior Chief's Palace, and ultimately to the Paramount Chief for ruling. Beyond this, the conflict goes to the government court of law.

3. LEGAL STATUS OF STATE LAND IN ZAMBIA'S PROVINCES

Chiulukire Local Forest falls under the jurisdiction of state lands of Zambia. Land management and control of state land is vested in the President of Zambia on behalf of Zambia's citizens. In Eastern Province, it comprises about 280,000 hectares or 4% of the total land area. The President through his government can make grants and arrange leases of 14-99 years through the Commissioner of Lands.

BRIEF SETTLEMENT HISTORY OF THE FIVE VILLAGE RESOURCE MANAGEMENT AREAS

1. HISTORY OF CHINKHOMBE

These people originally came from Sandwe village in Petauke to Sasare area in Katete District in the 1930s. Due to conflicts there they migrated to the present-day Ndelemani in 1939. In 1943 they settled near the Mponda River, and at the present site in 1970.

The village of Tontholani is relatively new; they came in 1998 from Chiwanga village. The ethnic groups are a mixture of Nsenga and Chewa. They are matrilineal.

Chinkhombe settlers that are inside the gazetted forest boundary came from Cholowa village. They came in 1996 after hearing rumours that the forest was going to be degazetted, according to Nthambwa and Tontholani residents.

The distance they state that they walk to collect firewood varies from 500 meters (Cholowa) to 5 kilometers (Chiwanga).

2. HISTORY OF MAGOBO

The first to settle here were in Kazika in 1958. After 15 years, Kazika moved to Matunga area to be closer to school and clinic. In 1989 they came back to the original site. The next year, 1990, Mlangali village settled inside the forest in Magobo to seek fertile land to alleviate a hunger problem.

Declines in honey are blamed on the opening up of agricultural fields (it is not clear whether it is only that "bee trees" were overcut, or if cotton pesticides added to the decline). Availability of fruits also has declined, and this is blamed on bad harvesting methods, which means cutting the tree down for the fruit. Caterpillars are also reported to be in decline. Again, interesting to note that insect-related forest products are all in decline, perhaps related to cotton chemicals.

This is the only area to have mentioned snails among their nontimber forest products. Regeneration and wildlife availability are perceived as poor due to fire management practices, and a decrease in number of tree species (biodiversity) is noted.

Interviewees stated that the Agriculture Department has functioned in both pre- and post-colonial times up to now. Lintco Cotton came in 1990, Clark Cotton came in 1994, then Sable in 1995, then Cotmark in 1996, then Lonrho in 1997, and now CLUSA in 1999. There have been some less formal institutions such as briefcase dealers and women's clubs organized by the ruling party.

The distance they state that they walk to collect firewood varies from 10 meters (villages inside forest) to 800 meters (Kazika).

3. HISTORY OF MATUNGA

Sunkhu, Gomani, Mbang'ombe, and Ng'ombayela came to this area first in 1929. Later came Katimbila, Ntambwa, Chikumba, Tambala, Kazembe, and many others making the present-day Matunga.

The name "Matunga" originates from the place where special loincloths were sewn in the original villages. A woman there fabricated (kutunga = to sew) these cloths, called "ngumbi", and sold them to neighboring villagers (input by Moses Staff Phiri, age 72).

Agricultural and other activities were started by the colonial District Agricultural Officer Mr. Fraser in 1942. They continued take place within forest boundaries even after the forest was gazetted in 1958 because villagers did not hear about the new administrative arrangement with the Forest Department until 1967. At that time they abandoned their fields and other activities inside the boundaries.

This trend was reversed starting in 1990 when people slowly started opening fields inside the forest again. The reason given for this is population pressures for more farmland, coupled with poor soil fertility on existing fields due to poor farming practices.

The distance that they state they walk to collect firewood varies from 500 meters (Kazembe) to 2 kilometers (Mkokeza).

4. HISTORY OF MKAIKA

This area covers a stretch about 7 kilometers long between Agasi and Chipilingo with Kalima, Geleta, Kawaza, and Kanyatula in-between. The first to be built was Geleta, with settlers from Munyamadzi looking for more agricultural land in the 1940s. Settlers who broke away from Sumbwi came to Agasi around 1946. Chipilingu was founded in 1957 and Kawaza in 1959 with settlers from Nzamani (Chipata District), and Chimtanga (Chadiza District) called by Chief Mbang'ombe. Kanyatula and Kalima splintered from Kawaza and Agasi in 1983 and 1994, respectively.

The villagers state that they do not need to go as far as the protected forest (4-5 kilometers away) for cultivation, poles and so on because of locally fertile soils and availability of trees.

5. HISTORY OF ZINAKA

Ndelemani first started in 1930. It was followed by the establishment of Chikukula and Mutopa in the 1950s, then Zinaka, Sekani, Kasankha, and Makusi. At the beginning there was a lot of game, which was driven out as the number of villages, started increasing noticeably in the 1980s. Settlers inside the forest came in 1997 looking for water plus arable land.

Most forest products are collected for subsistence only. It was noticed that in the 1980s the population of caterpillars dropped as a large part of the forest was sprayed by tsetse fly eradication projects. As for mushrooms, no changes in availability have been noticed so far. The collection of honey and bamboo for baskets has shifted from subsistence to commercial use. At the same time, a decrease in bamboo availability is noted.

The other resource in decline is "choyo" or broom grass, supposedly due to unsustainable harvesting.

The distance that they state they walk to collect firewood varies from 50 meters (Kamkukute, inside the forest) to 2 kilometers (Makusi).

ORIGINAL REASONS FOR RESERVATION AND OBJECTS OF MANAGEMENT

The following text copied from the reservation proposal describes the original intentions of the Forest Department in the late 1950s:

> *The area forms part of the series of indigenous pole production forests from which purely local demands for poles will be met. It is intended that the proposal be handed over, under Section 10 of the Forest Ordinance, to the Chewa Native Authority to manage on a simple early-burning – cum coppice system.*

GOOD AND BAD FOREST

One of the questions posed during the village resource assessment of 1999 was the villagers' perception of what a good forest would be like. Following is the summary of their responses. They show that many respondents were viewing the forest mostly as a fertile soil resource and not necessarily as a long-term provider of forest products.

What is a good forest?

- ✓ *One which has diverse trees, good soils, and streams with running water, and which is suitable for habitation (Zinaka)*
- ✓ *One with various types of animals, with bamboos which indicate fertile soil, with big grass and a lot of trees, with good crop yields, and with various species of trees and vegetation (Magobo)*
- ✓ *One with good availability of trees and tall grass which shows the soil is fertile; a good variety of both tree and animal species, giving a wider choice and several options as to what use it can have; soil which is not rocky as it can't support vegetation favourably; soils that are well-drained; and terrain which is not too steep (Matunga)*
- ✓ *Forests maintain soil fertility, protect flow of rivers, and provide animal habitat. They provide durable trees that are used to build houses. Undisturbed forests can indicate culturally important burial grounds. Forests are used in the economic sense for hunting, grazing, collection of wood, collection of food, handicraft materials such as for mats and mortars, and utility items such as tool handles and brooms (Mkaika)*

What is a bad forest?

- ✓ *One in which the grass does not grow, where soils are clayey, where a lot of phingo and mphalankaya grow, and where there are few trees (Magobo)*
- ✓ *One without a good number of trees and vegetation cover, without availability of wildlife, grass, and fodder, without a good range of fruit trees, but having a lot of thorn trees and shrubs, and poor soil that cannot support a good cover of vegetation (Matunga)*

SECTION III. OBJECTIVES AND STRATEGY

The following objectives were elaborated during a workshop with villagers representing all sides of the forest in November, 2000.

DEVELOPMENT OBJECTIVE

To Link Sustainable Forestry to Community well being by combining Conservation with Economic Development and Cultural values to benefit present and future generations of the local people.

GENERAL OBJECTIVES

a. To control destructive wild fires and late fires in the forest reserve.
b. To reverse the trend of illegal settlements and cultivation in the forest reserve.
c. To protect water catchment areas and conserve watercourses.
d. To rehabilitate degraded sites in the forest reserve.
e. To promote natural regeneration both inside and outside the forest reserve.
f. To protect the heritage sites in the forest reserve.
g. To develop forestry related and other small businesses in the communities.
h. To increase the forest-based incomes for villages surrounding the forest reserve.
i. To optimize economic utilization of timber and non-timber forest products in Chiulukire.
j. To protect and conserve reserved areas for ecological, cultural and social benefits to the local community.
k. To promote alternative farming techniques outside the forest reserve, such as conservation farming, agroforestry and soil and water conservation, in order to increase crop yields and reduce pressure on the forest.

GENERAL STRATEGY

1. USE OF WORKSHOPS AND COLLECTED INFORMATION TO WRITE THE PLAN

1.1. VILLAGE RESOURCE ASSESSMENTS, MAP UPDATES, AND WORKSHOPS

Planning for resource management requires familiarity with the resources available in the forest. In 1999, the village resource assessment (VRA) was used to help identify important and rare resources and potential ways to quantify them. "Resource informants" gave insight as to the chapters that should be addressed in this plan.

Concurrently, Global Positioning System was used with satellite imagery and village sketch maps to update map locations of villages and roads that have changed since the most recent topographic maps date from the 1970s.

Third, workshops with village, Forest Department, Chief, and District Development Council representatives were held in November 2000 and May 2001 to summarize and refine inputs to the plan contents.

1.2. USE OF THE TECHNICAL INVENTORY TO AID IN CALCULATING SUSTAINABLE HARVESTS

In year 2000, a technical inventory was carried out to get an idea of how many potential forest products per hectare are available for economic and household use.

The inventory information is incorporated into the following chapters on different activities. Maps were produced from the data showing the density of trees and other products that are interesting to different user groups. For some activities, tables of the amount of product present in year 2000 are used as a basis to calculate an annual allowable harvest for the products. This was accomplished by superposing the stand map (and accompanying density tables) onto the Village Resource Management Area (VRMA) map, and then calculating the total resources available to each VRMA. The stand map, which is the template for inventory information on product density, is shown on the next page.

The current standing inventory must satisfy the local users of the resource for a set number of years until younger trees grow again to meet the needs of the future beyond this 10-year plan. Thus ***the calculations of the annual harvests for all destructive tree uses are based not only on the currently standing trees, but also on the number of forest-dependent workers that must be sustained by them over 10 years.***

2. ESTABLISHMENT OF VILLAGE ENTITIES THAT WILL IMPLEMENT THE PLAN

Each Village Resource Management Area will select its own Village Resource Management Area Committee (VRMAC) and pay its own Village Resource Guards to assist in implementing activities described in this plan. The organisational chart of this VRMAC and the procedures for implementation are described in Section Five of this plan.

3. ESTABLISHMENT OF A REVENUE-GENERATING SYSTEM TO SUSTAIN FOREST DEPARTMENT, DISTRICT COUNCIL, CHIEF, AND VRMAC OPERATIONS

The revenue system has one free-harvest policy and two components for guiding the spending of harvest permit incomes.

One of the permit components is for sharing revenue between villages and government, and the other brings 100% of permit-selling revenues back to the village level. The revenues are distributed according to which product is being harvested. Market incomes from selling forest produce go back to those who have bought the permit and have harvested it.

3.1. SHARED-REVENUE PRODUCTS

Products whose permit revenues will be shared by government, traditional authority, and villages are:

- Bamboos sold commercially with or without value-added component
- Barkhive trees
- Felled trees whose carvings are to be sold
- Poles to be sold
- Charcoal trees
- Sawtimber trees

Government shares of permit revenues are to be used for costs of monitoring and implementing this plan. Village shares are to be used for community betterment. Chief shares are to be used for advisory and judiciary functions performed by him or his representatives. Guidelines for revenue uses are found in Sections V and VI.

3.2. VILLAGE REVENUE-ONLY PRODUCTS

Products whose sold permit revenues come back 100% to the villages by way of the VRMAC trust are:

- Fines levied by Village Resource Guards or others on those who violate conditions of forest use, described in activity chapters
- Barkrope sold commercially or used to tie charcoal sacks
- Brooms and sunde bushes with or without value-adding
- Caterpillars sold commercially on a large scale
- Field rents, if implemented
- Fish if sold commercially
- Fruit if processed commercially
- Grazing cattle (annual fee per head), if implemented
- Medicinal plant parts sold on a large scale
- Mushrooms sold at a commercial scale, with or without value added
- Thatch sold in quantity in Katete or other large markets
- Wildlife hunting (small scale only, after moratorium is lifted)

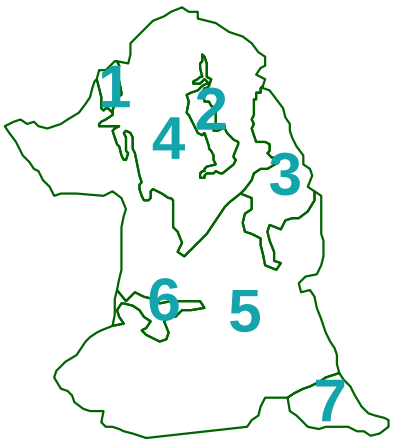
4. ESTABLISHMENT OF ANNUAL VRMA REGISTERS FOR PRODUCTS REQUIRING NO PAID PERMITS

Certain forest products may be harvested free of charge, but will require that users undergo training and/or informational sessions on legal and ecological aspects of harvesting their products. Once sensitized and agreeing to abide by the legal and ecological conditions for harvest, users may be placed on an annual register kept by the VRMAC. Only registered users may collect the products listed. These products include the following *as long as they are used domestically*:

PRODUCTS REQUIRING SENSITIZATION BEFORE USERS ARE PLACED ON REGISTER:

▪ bamboos	▪ grazing (fodder) trees
▪ caterpillars	▪ medicinal plants
▪ barkrope	▪ mushrooms
▪ firewood and charcoal	▪ poles with a specific domestic use and in a specific maximum number
▪ fish, respecting years of moratorium on fishing	▪ thatch destined for domestic use
▪ fruits	▪ wildlife

STAND MAP:



TOTAL = 10,600 hectares (approximate)

APPROXIMATE STAND SIZES and descriptions:

1 – 100 hectares *(small sawtimber, charcoal (mopane and kamphoni), and broom species)*

2 – 260 hectares *(quality poles, bamboo, hives, young sawtimber, phingo, fodder)*

3 – 770 hectares *(bamboos, phingo, barkhives, charcoal species)*

4 – 2770 hectares *(kamphoni in many size classes, charcoal species, secondary sawtimber (B. bussei))*

5 – 6290 hectares *(few mukwa, many Brachysteg and kamphoni all size classes, Acacia and mchenja)*

6 – 200 hectares *(to be sampled in 2002)*

7 – 410 hectares *(kamphoni and Brachystegias, esp. B. bussei*

SECTION IV. ACTIVITIES CONTROLLED BY THE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES (VRMACs)

IN ALPHABETICAL ORDER

BAMBOOS
BARKROPE
BOUNDARY RECOGNITION
CARVING SPECIES
CATERPILLARS
CHARCOAL
CUTTING METHODS
FIELDS AND SETTLEMENTS INSIDE FOREST
FIRE
FIREWOOD
FISH
FRUIT TREES
GRAZING
HONEY
MEDICINE
MUSHROOMS
POLES
RESERVED AREAS
SAWTIMBER
SUNDE BROOMS
THATCH
WATERCOURSES
WILDLIFE

BAMBOOS

1. SPECIFIC OBJECTIVES

a. To maintain or increase availability of bamboos in all five VRMAs through regeneration and proper cutting techniques

b. To manage and utilize bamboos sustainably

c. To promote value adding as requested by user groups

2. STRATEGY

a. In order to increase bamboo availability, each VRMA will set aside an area for planting and managing bamboos for local and commercial use.

b. User groups will be organized in each VRMA for addressing common issues and training needs in processing and marketing.

c. CLUSA will facilitate value-adding training for bamboo groups.

3. LEGAL ASPECTS

a. All bamboos collected for sale or processed to add value shall be by paid permit whether collected from inside or outside the forest reserve.

b. Bamboos collected for domestic use may be collected with a free permit. Domestic use is defined as material for roofing, fencing, basketry, furniture, and other home products used at village level. The VRMAC shall determine the number of bamboos to allow free for domestic use.

c. People from villages outside the VRMAs are required to pay for collection of bamboos regardless of their use.

4. ECOLOGICAL PRESCRIPTION

a. Bamboos are mainly found in Magobo though some are found in Mkaika, Matunga, Zinaka, and Chinkhombe. Some are found around fields outside the forest. The local bamboo (*Oxytenanthera abyssinica)* takes about 7 years to mature and flowers only once in its lifetime before dying.

b. Selective cutting of bamboos at ground height can be used to stimulate regrowth. Bamboos may be replanted in areas set aside in each VRMA using root suckers or rhizomes.

c. Bamboos when rampant can become a source of competition with sawtimber species for sun, water, and soil resources. Therefore, near timber-producing areas, tree cover should interface with bamboo stands and be given preference to avoid over-spreading.

d. Bamboo stands thus in competition with other users' tree species can be eliminated on approval of both sides by cutting at 1 meter height to encourage rot in the rainy season. Offering shoots as cattle browse is another option.

5. FINANCIAL ASPECTS

The VRMACs shall collect permit fees on bamboos. The cost of the permit will be ZK900 per 20 canes to be used commercially. The VRMAC shall share money raised from permit sales in the proportions described in Section 5.

a. Revenues raised from sale of value-added bamboo products shall belong to members of that user group.
b. Collectors of bamboos for domestic use must follow a sensitization on best cutting and regeneration methods and resolution of conflicting uses of stems of different sizes.

6. INDICATORS FOR MONITORING

The VRMAC and user group shall be responsible for monitoring bamboo stands in their areas, using the following indicators:

a. Observations on success of bamboo regeneration reported by users to VRMAC
b. Number of hectares of bamboo reserves set aside and mapped in each VRMA
c. Quantity and type of bamboo products marketed, according to permits sold
d. Incomes from bamboo products.

Bamboos grow in clumps, sometimes to the exclusion of allowing trees to regenerate.

BARKROPE

The following species are favoured for barkrope collection in Chiulukire Local Forest: *Brachystegia spiciformis* (mputi), *Brachystegia longifolia* (bovu, mfendaluzi), *Brachystegia manga or allenii* (msumbu).

1. SPECIFIC OBJECTIVES

a. To conserve and regenerate species that are suitable for barkrope production for local use;

b. To determine a sustainable method of harvesting barkrope taking into consideration other future uses of the barkrope species.

2. STRATEGY

a. Collectors of barkrope will be encouraged to harvest it in a manner that does not completely kill off the young trees but that these should be able to coppice or regenerate after removal of part of the bark.

b. Collectors will also be required to harvest bark from trees of a particular size and species.

c. Other rope-producing plants such as sisal and papyrus (mlaza) will be promoted in the villages to supplement fibre-producing trees and reduce pressure on them.

d. The commercial potential for barkrope production will be considered in the future.

3. LEGAL ASPECTS

a. Barkrope for domestic use shall be collected with a free permit.

b. Large trees will not be cut down for the collection of barkrope from its branches; but branches may be cut from the top of a tree as long as the life of the tree is not endangered.

c. Only trees between 7 and 15 centimeters in diameter shall be used in the harvesting of barkrope.

d. For now, commercial harvest of barkrope is prohibited. However, if the user group can make a proposal for commercial harvest that is not destructive to the honey-producing and other user groups, and that will leave sufficient regeneration, it can be considered by the VRMAC and an appropriate revenue collection scheme shall be made.

4. ECOLOGICAL PRESCRIPTION

a. The most highly-ranked barkrope species from the VRA study (1999) are:

LOCAL NAME	SCIENTIFIC NAME	OTHER USES (POTENTIAL CONFLICTS)
Mfendaluzi, Bovu	*Brachystegia longifolia*	▪ Charcoal production ▪ Firewood ▪ Bee forage
Msumbu	*Brachystegia manga or allenii*	▪ Charcoal production ▪ Barkhives
Mputi	*Brachystegia spiciformis*	▪ Firewood ▪ Barkhives

b. It is recommended to cut trees coppice-style (clean stump to maximum 30 cm height) to best regenerate the barkrope trees.
c. Otherwise, regeneration of barkrope trees can be achieved from seed as well as coppice, especially for bovu. Therefore, a selective cut method within the coupe system would work well for regeneration.
d. Collection should not involve complete debarking of a standing tree.
e. If branches are harvested from a large tree and then debarked, the debarked branches must be cleared from the tree trunk to avoid hot fires there. The branches should be used for firewood.

5. FINANCIAL ASPECTS

a. Domestically-used barkrope shall be collected free by those who have passed a sensitization on the ecological aspects outlined above and then have been placed on the VRMAC annual register.
b. Barkrope used to tie up charcoal sacks or other commercial use will be charged per felled tree if taken from outside the demarcated coupe (felling) area. The rate charged will follow that for poles (POLE chapter) and the permit will be purchased from the VRMAC.

6. INDICATORS FOR MONITORING

Monitoring of barkrope harvesting and regeneration shall be done by the VRG and the user groups. Indicators will include:

a. Number of households that plant alternative rope-producing plants in their village.
b. Documentation of species of trees being harvested for barkrope

Ropes pulled from young Brachystegia bark are needed for hanging hives, tying charcoal sacks, and other uses, both domestic and commercial

BOUNDARY RECOGNITION

1. OBJECTIVES

a. To ensure recognition of legal forest boundary by village residents, village headmen, chiefs, and Forest Department

b. To clarify the regions for which the five VRMAs take responsibility for joint management

c. To provide physical evidence of boundaries where they are not made of natural watercourses so that those who are unfamiliar will know when they have reached the joint forest management area

2. STRATEGY

a. Inform the Chief of the objectives, strategy, and results of this activity; obtain his support

b. Walk to the forest boundary closest to each VRMA with a group composed of village members and Forest Department and with the original boundary description from 1950s

c. Find existing beacons on topographic map, and photography (satellite image); record location by GPS

d. Agree on named watercourses comprising the legal boundary; make corrections of names and locations where necessary

e. When reaching unmarked or indefinite segments of the boundary, mark the two known endpoints of the segment with stone piles (beacons). Then, devise a plan with Forest Department for future recognition of these segments using any of these methods:

   - Define the bearing and distance and plan to clear brush and trees at a width of 6 meters along this line periodically; village labour and Forest Department surveying expertise will be used
   - Plan on explaining/showing the acknowledged forest boundaries to outsiders anytime they are encountered in the area
   - Plant a row of exotic tree species (jacaranda, Cassia, etc.) the length of the unmarked portion, and protect the trees for 5 years from grazing and fire until they are able to survive on their own

3. LEGAL ASPECTS

a. Any person or village found to move a beacon shall be prosecuted in the court of law in accordance with the Forest Act No. 7 CAP 199 of 1999, which carries a jail term not exceeding 6 months, a fine not exceeding ZK 5.4 million, or both.

b. User groups working inside Chiulukire Local Forest will be considered legally bound to assist in boundary delimiting activities in exchange for the right to use forest products.

4. INDICATORS FOR MONITORING

The following are indicators for monitoring:

a. Boundary work will be supervised by the Forest Department..

b. Demarcation and other activities should be finished within 3 years of plan signing.

c. Progress reports will be submitted annually by the VRMACs and Forest Department to the JFM Committee.

CARVING TREES

The following trees used for artisanal and domestic wood carvings grow in Chiulukire Forest: *Crossopteryx febrifuga* (mwavi), *Dalbergia melanoxylon* (phingo), *Faurea speciosa* (chiyele), *Julbernardia globiflora* (kamphoni), *Lannea discolor* (muwale, shaumbu), *Pavetta schumanniana* (mtukumphako), *Pericopsis angolensis* (muwanga), *Ricinodendron rautanenii* (mkusu), and *Swartzia madagascariensis* (mchelekete).

1. SPECIFIC OBJECTIVES

a. To promote a woodcarving industry that could increase local incomes

b. To promote organization of wood carvers into user groups for marketing, training, and utilization purposes

c. To focus on regeneration on woodcarving species that are becoming rare

2. STRATEGY

To follow the regeneration recommendations set out below in Ecological Prescriptions concerning:

- Controlling late fires
- Coppicing
- Clearing debris from around the stump
- Devising special plans for protected species

3. LEGAL ASPECTS

a. Felling a tree for its carvable content shall be done by permit whether the tree is inside the Forest or outside. The price of the tree is set by the Forest Department. The permit is obtainable through the VRMAC and revenues from permit sales shall be shared according to the proportions noted in chapter 5.

b. The same felling conditions used in pitsawing shall be followed when cutting trees for wood carvings.

c. Trees that are more valuable for sawtimber must be left as such, based on the species, straightness, size, and health of the bole.

d. For the first 3 years of the management plan, no *Dalbergia* (phingo) nor *Swartzia* (mchelekete) shall be cut until a plan for regenerating these rare species is put into place.

e. For domestic use, small utensils such as cooking sticks will be obtained from branches and offcuts of paid felled trees. Mortars requiring felled trees will be by paid permit. This policy will be reviewed after two years.

4. ECOLOGICAL PRESCRIPTION

a. The following species can be regenerated by coppicing: *Julbernardia globiflora* (kamphoni), *Lannea discolor* (muwale, shaumbu), *Faurea speciosa* (chiyele), *Crossopteryx febrifuga* (mwavi), and *Pavetta schumanniana* (mtukumphako). However, stumps must be cleared of debris so that regeneration will not be harmed by early burning.

b. Methods of regeneration of *Swartzia* and *Dalbergia* must be explored and recommended by user groups interested in exploiting these rare species. A proposal for regeneration should be put before the VRMAC within two years of signing of the management plan.

c. The stump height is limited to 30cm. Once the tree is cut, the stump shall be trimmed to encourage regeneration by coppice shoots (see chapter on cutting systems).

d. Since some species used by wood carvers are also used by other groups, they should participate in charcoal production site prospecting and claim trees that are valuable to them before the trees are cut and burned for fuel or made into barkhives.

e. Training in full-tree utilization (or other relevant subjects) is possible at the request of the user group.

5. FINANCIAL ASPECTS

a. The Village Resource Management Area Committees shall be responsible for collection of revenue from permits sold to commercial wood carvers.

b. Woodcarvers on an annual VRMAC domestic-use (free) register will be required to go through informational sessions on the legal and ecological aspects and agree to abide by them.

6. INDICATORS FOR MONITORING

The following indicators may be used for monitoring:

a. Coppicing success of harvested trees (woodcarvers will revisit harvest sites to assess this; Forest Department may lend advice)

b. Number of illegally-cut carving trees (and resulting fines) noted by Village Resource Guard

c. Number and quality of wood carvings made available for sale in local markets and abroad (assessed by user group marketing component and reported to JFM Committee)

d. Number of user groups organized around the forest (reported by VRMACs)

e. Revenue raised by the Village Resource Management Area Committee from tree harvest permit

Wood carving encompasses artisanal as well as cultural uses; hoe handles and drums, among others.

CATERPILLARS

There are at least nine species of caterpillars in Chiulukire local forest.

1. SPECIFIC OBJECTIVES

a. To conserve and regenerate host tree species for breeding of caterpillars

b. To promote value adding by processing caterpillars

2. STRATEGY

The strategy will involve principally raising awareness of

- host tree species and their conservation and regeneration by proper harvesting methods;
- the nutrition content of caterpillars as a diet supplement; and
- the possibilities of ways to add value to increase incomes to women.

3. LEGAL ASPECTS

a. Caterpillars shall be collected freely by persons on an annual VRMAC register (see Financial Aspects).

b. The following regulations shall apply when collecting caterpillars:

- No tree shall be cut when collecting caterpillars
- Caterpillars shall be collected by shaking the tree, climbing the tree and picking from the ground
- Host trees for caterpillars shall be protected against fires

4. ECOLOGICAL PRESCRIPTION

a. One species locally known as Mphalabungu is almost extinct due to tsetse fly spraying which has been carried out in 1970s by the Department of Veterinary and tsetse control. The chemicals used to eradicate tsetse flies has an effect on this and other plants and animals.

b. The edible caterpillars are produced by butterflies and moths, which lay eggs on trees in September. The eggs hatch in October- November and produce young caterpillars, which feed on young leaves. Caterpillars can consume about 100 kg per hectare of foliage at peak density, but 90 per cent is returned to the soil as faeces (Malaisse 1978). Host trees often produce new leaves within a few months (Campbell 1988).

c. Collection should be done between November and March.

d. Collection of caterpillars from tall trees must not cause them to be cut down.

The table below shows the Host plant species on which some caterpillars are found.

CATERPILLAR	HOST PLANT SPECIES	
	SCIENTIFIC NAME / ENGLISH NAME	LOCAL NAME
Nthowa	*Diplorhynchus condylocarpon*	Mtombozi
Masase	*Burkea africana*	Kawidzi
Matole	*Julbernardia panuiculata*	Mtondo
Vilungulungu	*Diospyros kirkii, Cussonia kirkii, Piliostigma thoningii, Crossopteryx febrifuga*	Mchenja, Mbwabwa, Msekese, Mwave
Mapala	*Brachystegia manga, Brachystegia bussei, Julbernardia globiflora, Brachystegia longifolia*	Msumbu, Msale, Kamphoni, Mfendaluzi
Mapalampapha	*Julbernardia paniculata*	Mtondo
Kapale	*Lonchocarpus capassa*	Chimphakasa, Mpandapanda
Mphalabungu	Grass	Udzu

5. FINANCIAL ASPECTS

a. Although permits are free as at signing of this plan, priority for collection shall be given to ***local women residing in Chiulukire villages***. Names of free collectors must be placed on an annual register only after a thorough understanding of the ecological and legal aspects has been gained.

b. If caterpillars are processed in order to add value and a large commercial operation results, the free permit aspect will be reviewed, and the VRMAC will decide on a fair price for a commercial annual permit.

6. INDICATORS FOR MONITORING

The following indicators shall be used to monitor the activities:

a. Regeneration of the host trees and plants: this must be noted by the collectors.

b. Quantity of caterpillars observed for sale, processed and unprocessed.

c. Availability of different species of caterpillars: collectors must report shortages and try to identify reasons.

Caterpillars add to the richness of local diets.

CHARCOAL TRIALS

The demand for charcoal is very high in urban areas: about 83% of the households use it as a source of energy. The average daily consumption of charcoal per household is 3.8 kilograms (WORLD BANK / ESMAP 1990). It is fair to assume that a strong market for this product exists both in Katete and Chipata.

The year 2000 inventory illuminated the fact that an abundance of charcoal trees grows in Chiulukire Forest, particularly the Brachystegias and Julbernardias. The plan therefore proposes a modest, well-monitored charcoal-producing operation to raise revenues for VRMAC and Forest Department operations from the beginning. The proposal is to produce on a trial basis until the process is determined to be ecologically stable.

1. SPECIFIC OBJECTIVES

a. To try producing charcoal in a sustainable way using a coupe system
b. To regenerate trees in clear felled and selectively felled areas
c. To organize charcoal producers into user groups for purposes of training and monitoring
d. To generate income from charcoal sales

2. STRATEGY

a. At least one trial charcoal production coupe of 20 hectares shall be set up in at least one of the five Village Resource Management Areas during the first year. The siting will be based on the stocking rate, species composition and topography of the area. The coupe will be divided into compartments to be felled alternately, thus ensuring that shelterbelts are left between clear felled areas.

b. Selective and clear felling methods shall be used in the coupe system depending on the stocking rates and species composition. Selective felling method shall be used where species composition and distribution is diverse with low stocking rates. Clear felling method shall be used where tree species are light demanders and there is high stocking rate in order to regenerate well.

c. The rate of regeneration shall be monitored during two seasons and comparison made between clear felled and selectively felled areas.

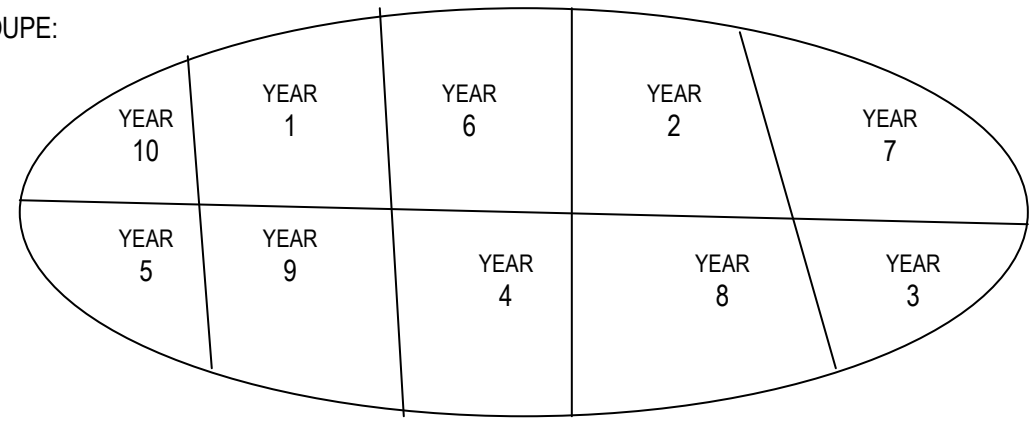
d. <u>COUPE FOR CHARCOAL PRODUCTION:</u>

The area is divided into compartments. Compartments are clearfelled once per rotation of 10 to 15 years. Shelter belts are unfelled compartments left between successively clearfelled compartments to provide seeds and shelter. See the diagram below.

Valuable timber species shall not be felled for charcoal production. At the moment of setting up the coupe, sawyers are required to identify current and future timber crop trees to be reserved.

The actual size, shape and arrangement of the coupes shall vary depending on the terrain.

COUPE:



3. PROPOSED SCHEME FOR CHARCOAL PRODUCTION

3.1. FIRST YEAR ACTIVITIES/OBJECTIVES

a. Brief study / verification of market:
- current charcoal prices (costs and sales)
- determine ideal charcoal pricing structure in order to compete with illegal charcoal producers / traders outside Chiulukire local forest
- identification of potential markets and means of transportation

b. Identify operation zones in the forest:
- Katete District Forest Officer visits sites with experienced local charcoal producers
- Estimate size of the operation areas and map them (exclude wildlife reserves and watercourses)
- Pick a specific area of 5 hectares maximum per VRMA for training and trials in the first year

c. Identify charcoal producers (workforce):
- Local charcoal producers available within Chiulukire villages
- Hivemakers and firewood producers willing to work with charcoal group
- Resource persons knowledgeable about production techniques
- Time of year when they can be actively involved in charcoal production

d. Design a scheme for harvesting in the second year based on the following:
- Number of charcoal producers
- Mapped area of operation
- Marketing Plan (Marketing strategy)

e. Formation of a charcoal user group with a spokesperson

3.2. SECOND YEAR ACTIVITIES

a. Set up the trial coupe area on the ground
- agree on alignment of the coupe (if rectangular, perpendicular to slopes)
- within the coupe, determine current standing valuable timber trees and mark them for pitsawing
- within the coupe, determine hive trees; notify honey group that they should cut hives off these
- determine which other trees (fruit, young sawtimber, and rare trees) should be left standing
- the remaining trees are cut for charcoal production

b. User group works with Facilitators and resource persons on marketing and record keeping

c. Evaluation of the entire process at the end of the season:
- delimitation
- tree preservation
- production method and yield
- recommended changes for the third year
- identification of next year's coupe location(s) and hectares; possibility of expanding to other VRMAs

3.3. THIRD YEAR ACTIVITIES

a. Based on recommendations from evaluation of the second year, repeat charcoal production and marketing methods of the second year
b. Assess regeneration in first coupe
c. Evaluate the process again at the end of the year and make recommendations accordingly
d. Set some objectives for numbers of hectares that can be realistically and sustainably cut for charcoal in combination with barkhives, crafts wood, medicine, and sawtimber

3.4. FOURTH YEAR ACTIVITIES

a. Continue charcoal production and marketing based on latest recommendation
b. Assess regeneration in coupes clear felled in the second and third years
c. Evaluate the process at the end of the year and make recommendations

3.5. FIFTH YEAR ACTIVITIES

a. Repeat the same activities as those in the fourth year

b. Evaluate the activities and decide whether to continue the program or not (Do a financial analysis).

4. LEGAL ASPECTS

a. No felling down of trees for charcoal production inside and outside the forest shall be allowed without a permit or licence.

b. Charcoal shall be produced in pre-mapped coupes.

c. Charcoal producers shall be responsible for fire management in their burn areas.

d. Trees for charcoal production shall have a minimum diameter of 10 cm at breast height.

e. The cord which has been sold by permit shall be measured by the Village Resource Guard. If the volume of the kiln surpasses 3 cubic meters, the charcoal producer will pay the appropriate price as required per cord.

f. THE FOLLOWING PROTECTED TREES MAY NOT BE CUT: timber species *Pterocarpus* (mukwa)*, Afzelia* (mgalilondo)*, Khaya* (mubwabwa)*, Terminalia sericea* (gonondo –yellow), and *Pericopsis* (muwanga); and fruit trees *Uapaca kirkiana* (msuku), *Strychnos spinosa* (mzimbili), *Strychnos cocculoides* (nthemya), *Diospyros kirkii* (mchenja), *Annona senegalensis* (mpovya), *Flacourtia indica* (nthudza), *Parinari curatelifolia* (mpundu) and *Garcinia huilensis* (matatane).

5. ECOLOGICAL PRESCRIPTION

a. Species used for charcoal production, especially *Brachystegia boehmii* (mfendaluzi), *Brachystegia manga* (msumbu), *Brachystegia longifolia* (bovu), *Combretum molle* (kalama), *Julbernardia globiflora* (kamphoni), and *Julbernardia paniculata* (mtondo) can successfully be regenerated by coppicing from stumps, by root suckers, and from seed. Regeneration of these species is currently well distributed throughout Chiulukire Local Forest.

b. Barkrope used for tying charcoal sacks shall be taken from branches and stems already cut for the kiln pile, not from trees outside the coupe area.

c. *Colophospermum mopane* is mainly found in the northern part of Chiulukire Local Forest. This species is very good for charcoal because of its high heat calorific value and durability, and because it produces little ash and smoke. Because its extent is limited, care should be taken not to overcut it and even to encourage its regeneration by early burning and cutting a clean stump for coppicing no higher than 30 centimeters.

d. The growth of grass tends to increase from the second year after clear felling the coupes and remains high until tree canopy is re established. In these areas thatch collection should be encouraged and effects of early burning monitored. Early burning shall be carried out between May and June every year to reduce mortality. The charcoal production user groups shall be responsible for early burning in Charcoal coupes.

6. FINANCIAL ASPECTS

a. The Village Resource Management Area Committees shall be responsible for sale of charcoal production permits and collection of permit revenues. Charcoal cords will be sold at ZK5,400 (or at the prevailing price) per three cubic meters (3 meters by 1 meter by one meter). Revenue collected from sale of charcoal permits shall be shared with Forest Department according to agreed ratios (Section 5).

b. The District Forest Officer shall collect conveyance fees for the user group's right to sell charcoal. The conveyance fee for a standard grain bag of charcoal shall be ZK360 (or the prevailing fee)

7. INDICATORS FOR MONITORING

The Village Resource Management Area Committee, VRGs, and the Forest Department shall monitor charcoal production activities and burning inside the forest. Outside the forest, traditional authorities need to assist in monitoring.

a. Hectares of charcoal coupes established in each Village Resource Management Area (VRMAC and FD responsible)

b. Yield in cords and sacks per hectare exploited (Forest Dept and producers)

c. Regeneration success judged by user group after 2nd, 3rd, 4th, and 5th years (FD and producers)

d. Availability of kamphoni trees as medicine source maintained (as reported by medicine user group)

e. Number of hives produced before logs are placed in kilns (Honey producers)

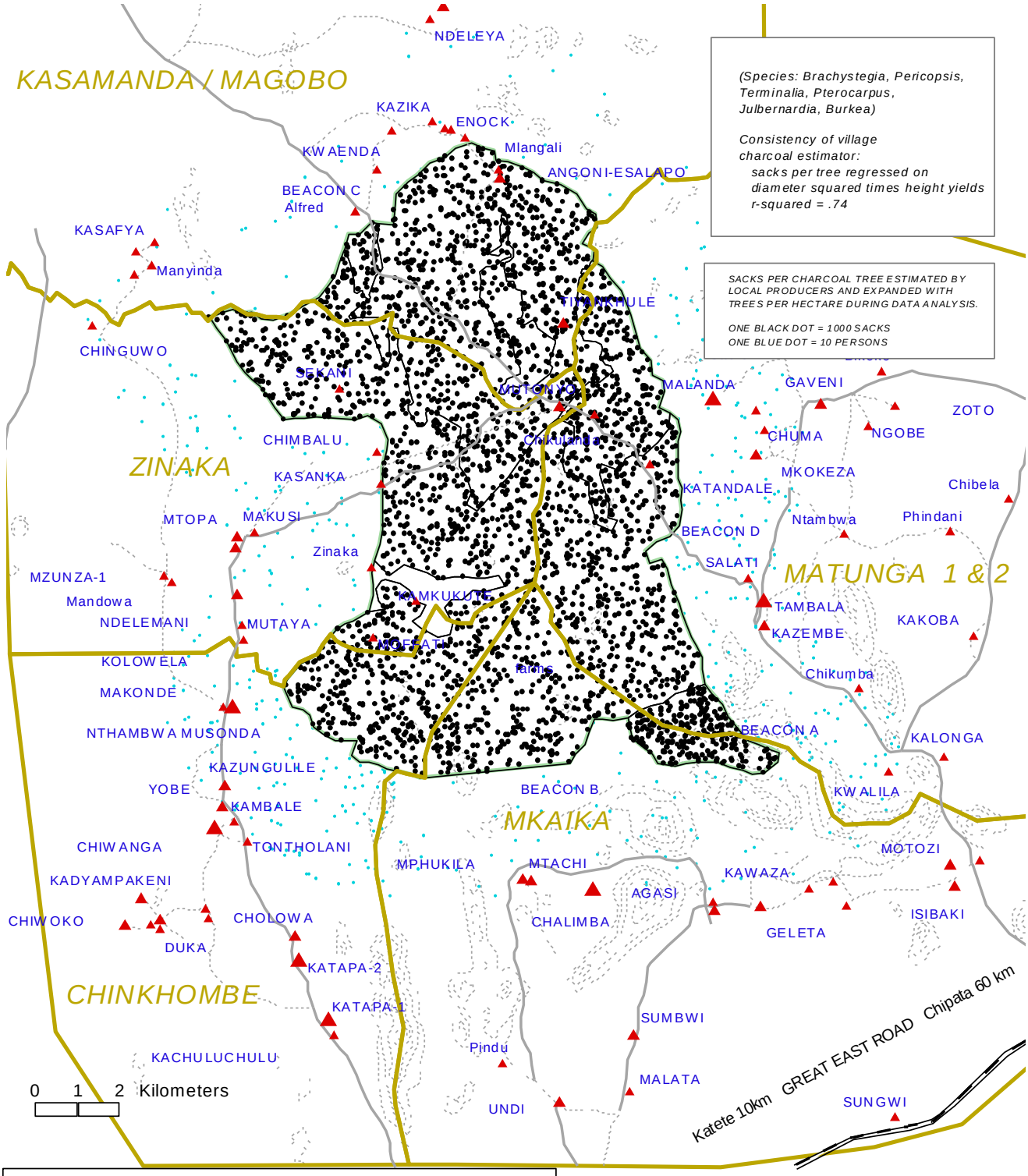
f. Number of hivemakers, firewood producers, traditional herbalists, and woodcarvers working with charcoal producers (VRMAC)

g. Number of charcoal producers in groups and number trained in proper cutting methods and monitoring of burns and regeneration (VRMAC and FD)

h. Number of infractions recorded with respect to cutting of protected trees and kiln fires out of control (VRGs)

i. Amount of revenue raised from sale of permits (VRMAC, JFM committee)

CHIULUKIRE LOCAL FOREST
Current total potential sacks of charcoal based on July 2000 inventory



CHARCOAL

Sacks of charcoal:
- 1000 sacks

Popul. density:
- 1 blue dot = 10 people

Villages and populations
- 1 - 100
- 101 - 200
- 201 - 600

Management area boundary

Roads
- Great East Rd
- wide
- narrow

MGMT AREA (VRMA)	Polys in VRMA	Tot HECTAREs	Tot 50kg SAX
CHINKHOMBE	2	1083	293,400
MAGOBO	6	2461	727,500
MATUNGA	4	2662	863,300
MKAIKA	2	1369	468,500
ZINAKA	6	3222	863,700

CUTTING METHODS: GENERALITIES

Two cutting methods may be used in Chiulukire Local Forest: selective felling and clearfelling.

1. SELECTIVE FELLING

This involves removal of single trees or groups of trees while leaving other high-quality trees for shade and shelter. This system can be used when harvesting timber trees and poles, and also when making charcoal. It promotes regeneration since sunlight is able to reach the young plants through the gaps created. However, because of conflicting uses of some tree species, care must be taken not to remove too many high-quality stems less than 30 centimeters in diameter, measured at breast height (1.3 meters from the ground). Examples include muwanga (timber conflicts with poles) and the Brachystegias (barkhives conflict with charcoal).

In the case of sawtree harvest, trained Village Resource Guards shall first mark timber trees before they are felled. Experienced Forest Department officers will give training in the first year of the plan.

Selectively felled areas may be clear felled for charcoal production later.

2. CLEARFELLING

Clearfelling is a method whereby in a demarcated area all or most forest produce is removed. This method may be used for charcoal production, or for timber production in areas where shade-intolerant timber species need light to regenerate. This method is applicable mainly in msale (*Brachystegia bussei)* or other stands of trees of homogeneous size.

Before clearfelling, provision for regeneration must be made either through shelterbelts or seed trees.

3. FELLING CONDITIONS

The following felling conditions shall be observed in both selective felling and clear felling:

a. Chainsaws and mechanized felling systems are not currently allowed in Chiulukire Local Forest.

b. All trees shall be cut 30 centimeters or less from the ground except for those which have a buttress or root swelling. Such trees shall be cut at a point immediately above the buttress or swelling.

c. The stumps should be cut at a 45-degree angle to discourage rot.

d. The stump of the cut tree shall be trimmed of splinters immediately after felling to encourage good and numerous coppice shoots.

e. All branchwood and waste derived from felling the tree or trees shall be lopped to ground level by the permit holder and cleared away from all growing trees and live stumps for a distance of at least two metres.

f. Branchwood and waste from appropriate species shall be recuperated for firewood.

g. The permit holder shall pay a fine for any non-permitted tree seriously (mortally) damaged in the course of felling or extraction. The permit holder shall also fell the tree and pay for the wood at the market price, and the revenue (collected by the VRMAC) remains with the community for community use.

4. REGENERATION OF PROTECTED AND VALUABLE SPECIES

"Protected trees" means trees that are rare and are not permitted to be cut in the first three years of the management plan. The list of species may be lengthened by VRMACs and includes at minimum:

- *Afzelia quanzensis (mpapa)*,
- *Cassia abbreviata (mleza, mkoswe)*
- *Colophospermum mopane (lupanya),*
- *Dalbergia melanoxylon (phingo),*
- *Khaya* nyasica *(mubwabwa),*
- *Swartzia madagascariensis (mchelekete)*

Once an acceptable regeneration plan for "protected trees" has been proposed by sawyer and other user groups in the VRMAs, the policy of no-cut will be reviewed. The plan may include plantation along watercourses accompanied by complete protection from grazing, cutting, and burning.

Zinaka and Magobo VRMACs will devise their own specific regeneration schemes for mopane since it is restricted to their areas.

5. REVIEW OF CUTTING POLICIES

All the cutting policies contained in this management plan must be reviewed in the first year and every after three years and adjusted as necessary. Justification for modifications include but are not restricted to

- a sustained number of cutting infractions noted by Village Resource Guards and VRMACs

complaints by locally resident sawyers of misallocation of cutting permits to harvesters outside Chiulukire area

- noncompliance with cutting conditions after all trainings are held
- findings of error in estimated sawtimber availability
- noncompliance of any party signing the management plan
- introduction of any mechanized timber production system in the VRMA

Pitsawing is an ecologically sound way to make planks from trees.

FIELDS AND SETTLEMENTS IN THE FOREST

It has been noted that there are almost 1000 hectares being cultivated in Chiulukire Forest currently, almost 9% of the land. The map at the end of this chapter shows the field locations. Several settlements also exist inside the forest. Most persons have alternative land to cultivate outside the forest, although some claim not to.

1. SPECIFIC OBJECTIVES

a. To resettle people who are currently inside the forest

b. To control further settlement and cultivation in the forest

c. To rehabilitate degraded areas

2. STRATEGY

a. Physical inspection and registration of fields, gardens, and settlements inside the forest is to be done by the Village Resource Guards with village headmen and VRMAC representatives, and verified by Forest Department every September, starting in year 2002.

b. Establish a realistic time-frame for squatter, settlement, and farmers' withdrawal from forest.

c. Explain the resettlement program carefully to villagers and dispel rumours quickly.

d. Educate farmers on the inside and outside of the forest in methods of conservation farming for their existing fields to remain productive.

e. Forest Department will assist Chief Mbang'ombe with maps showing potential relocation sites outside forest.

f. Allow abandoned fields to reforest naturally.

g. Depending on the situation, CLUSA may assist farmers with conservation farming methods to reduce forest destruction even if they are inside the forest. During the transition period, neither CLUSA nor any other organization will provide fertilizers for fields inside the forest. A memorandum will be circulated to all concerned organizations.

h. The preferred mode of reforestation is by natural regeneration of surrounding tree species. Where areas are too degraded from settlements and cultivation, a more intensive tact can be taken. Site recovery plans can be prepared jointly by the Forest Department, Joint Forest Management Committee, and the Village Resource Management Area Committee. The recovery plan will include methods of promoting regeneration of forest species.

i. Prohibit the cultivation of cotton inside forest boundaries in all cases.

3. LEGAL ASPECTS

a. The people who are settled in the forest reserve shall be resettled in Chief Mbang'ombe's area as alternative land is found for them.

b. No villages, fields, or gardens inside forest boundaries as of July 2001 shall be extended. The clearing of new fields inside the forest (either by persons residing inside or outside the forest) is strictly prohibited. Any person violating this regulation shall be prosecuted in the court of law in accordance with the Forest Act.[2]

c. The deadline for resettling the people currently inside the forest is June 30, 2003. This means that no more replanting will occur from the 2003-2004 season.

d. Those remaining in the forest after the 2002-2003 season will be required to pay the legally-allowed fees as prescribed in the Forest Act of 1999 and the fee schedules in effect at the time (Forest Department Regulations First Schedule Part III): that is, ZK72,000 per hectare.

e. No resistance shall be expected on any settlement in the forest when alternative land is found by Forest Department or the Chief.

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[2] *The penalty carries a jail term not exceeding six months, a fine not exceeding K5.4 million, or both.*

f. AFTER SIX MONTHS OF IMPLEMENTATION, the field issues and policies shall be reviewed again by the Chief and the Forest Department and a suitable strategy will be determined.

4. ECOLOGICAL PRESCRIPTION

Degraded areas shall be rehabilitated by natural regeneration and early burning. Rehabilitated areas may be used as demonstration areas for future reference.

5. INDICATORS FOR MONITORING

a. Annual progress on land allocations outside the forest, as reported by the Chief or representatives to the JFM Steering Committee

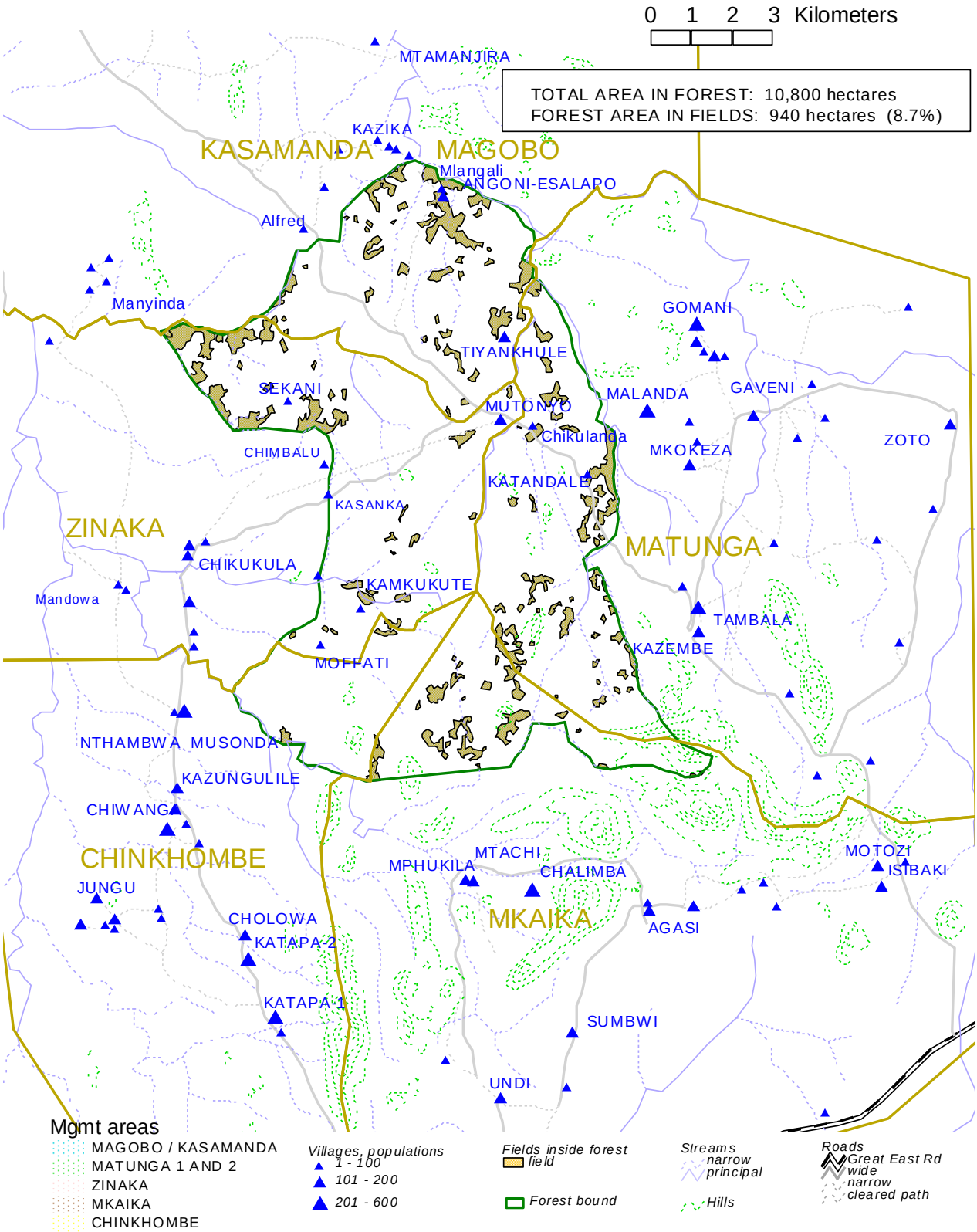
b. Number of new fields observed by VRGs each year; number of fallow fields going to tree cover

c. Number of fines and prosecutions pursued

Cotton fields inside the forest are the most destructive of forestland.

CHIULUKIRE LOCAL FOREST FIELDS

Traced from October 1999 SPOT satellite image
(1:25 000 scale, panchromatic, geometrically corrected, 10-meter resolution)



FIRE MANAGEMENT

1. SPECIFIC OBJECTIVES

a. Through adherence to the early burning program each year, to ensure:

- survival of all forest vegetation regeneration, and most importantly that of the commercially important species: sunde, sawtimber, thatch, fruit, mushrooms.
- an improved quantity of game for future hunting
- preservation of important soil organisms
- control of plant and animal pests
- avoiding over accumulation of fuels on the forest floor

b. To control incidences of late fires

2. STRATEGY

a. Revitalize Forest Department and traditional authority involvement in executing early burning program

b. Early burning will commence anytime from the 15th of May every year. However, determination of actual date will be done after an assessment by the Forest Department and the Village Resource Management Area Committees.

c. The Village Resource Management Area Committees will inform the local communities about the early burning commencement date and procedures

d. Use VR Guards to patrol observation routes during fire danger season August to November. In case of fire, the VRG is authorized to mobilize whoever is in the vicinity to assist in extinguishing these late fires.

3. LEGAL ASPECTS

a. No late fires (after 15th August to November) shall be permitted in Chiulukire Local Forest.

b. No person shall carry out any of the following in Chiulukire Local Forest without authorization from the Village Resource Management Area Committee or the Forest Department:
   - set fire to any tree, undergrowth, grass, or forest produce
   - allow any fire lit by any person or the employees or agents of that person to spread into the local forest

c. Any person 18 years of age and above in the vicinity (within 5 kilometers of the boundary) shall be bound to assist in extinguishing the late season fire in Chiulukire Local forest.

d. During early burning period, farmers with fields inside the forest must be prepared to extinguish fires that enter their fields and settlements.

e. Any person caught breaking the above regulations will be fined ZK20,000 AND ALSO
   - if the offender is a hunter, he will lose his licence for one year as well;
   - if the offender is a herder, he will lose a year's grazing permit as well.

4. ECOLOGICAL PRESCRIPTION

a. Early burning assists in breaking seed dormancy and encourages regeneration of vegetation. Seeds of Combretum, Terminalia and Pterocarpus spp are protected from the direct effects of fires by their indehiscent friuits (Chidumayo.E.N, 1997).

b. Early fires also prevent the buildup of pests such as ticks, tsetse flies, and grasshoppers, by destroying their reproduction cycle.

c. Late fires can destroy plant and animal diversity by killing seeds, regeneration, and soil organisms. Late fires also kill useful insects like bees and caterpillars. They should be extinguished as soon as they are spotted in the forest.

d. Fires easily destroy fire-sensitive species such as *Albizia* and *Uapaca* and the young of *Burkea africana* (kawidzi), *Julbernardia globiflora* (Kamphoni) and *Pseudolachnostylis maprouneifolia* (msolo).

The following table shows some of the trees that can be damaged most easily:

FIRE - INTOLERANT or SEMI-TOLERANT SPECIES (more likely to die)		FIRE-TOLERANT SPECIES (less likely to die in hot fires)	
SCIENTIFIC NAME	LOCAL NAME	SCIENTIFIC NAME	LOCAL NAME
Brachystegia longifolia	Bovu	*Anisophyllea boehmii*	Mfungo/ Mkondamadoda
Bridelia cathatica	Mkuzyandola	*Diplorhynchus condylocarpon*	Mtowa, Mtombozi
Bridelia duvigneaudii	Mwanjane	*Erythrophleum africanum*	Kawidzi
Brysocarpus orientalis	Kapululambuzi	*Dombeya rotundifolia*	Matowo, Mchiu
Garcinia huillensis	Matatane, Msongwe	*Hymenocardia acida*	Kabale
Hexalobus monopetalus	Mkhandanchem-bele	*Parinari curatellifolia*	Mpundu
Julbernardia paniculata	Mtondo	*Pterocarpus angolensis*	Mlombe
Lannea discolor	Shaumbu	*Strychnos cocculoides*	Mthemya
Pseudolachnostylis maprouneifolia	Msolo	*Strychnos innocua*	Mtulutulu, Kabulukulu, Mtheme
Uapaca kirkiana	Msuku	*Strychnos spinosa*	Mzimbili
		Swartzia madagascariensis	Mchelekete
		Syzygium owariense	Katope
		Uapaca nitida	Kasokolowe
		Vitex madiensis	Fika, Mdyafungu

Based on Trapnell (1959)

5. INDICATORS FOR MONITORING

The VRMAC and the Forest Dept shall be responsible for monitoring the early burning program. Reports of serious fires shall be submitted to the Joint Forest Management Committee for annual reporting. Indicators:

a. Number of late fires reported by the Village Resource Guard to the VRMAC

b. Pest and disease incidences in crops and livestock around the forest

c. Long-term regeneration survival as reflected in reports of shortages by user groups

d. Community trainings and participation in extinguishing fires

FIREWOOD

The following species have been named by villagers as preferred for firewood: *Brachystegia boehmii* (mfendaluzi), *Brachystegia longifolia* (bovu), *Combretum molle* (kalama), *Julbernardia globiflora* (kamphoni), and *Brachystegia bussei* (msale).

1. SPECIFIC OBJECTIVES

a. To utilize and sustain the supply of firewood in Chiulukire Local Forest
b. To ensure the availability of firewood to local women and households
c. To raise revenue from sale of surplus firewood

2. STRATEGY

a. Firewood collectors will be encouraged to work closely with hivemakers and pitsawyers to utilize all parts of the trees preferred by many user groups. The potential for firewood sales from offcuts of barkhive trees and charcoal production will be presented to villages.
b. Women, who normally collect household firewood, will report shortages and lengthening distances for firewood collection to their VRMAC so that competition for this vital resource can be reduced. Women will be awarded priority rights to firewood in any conflict arising. They should be placed on VRMA registers.
c. Promote use of improved stoves.

3. LEGAL ASPECTS

a. Firewood for domestic use shall be collected without paying. Priority shall be given first to local women for firewood collection; then to local village members. Collectors are obligated to receive information on legal and ecological aspects before being allowed to register annually with the VRMAC.
b. A permit shall be required for collecting firewood to be sold commercially. Permits shall be purchased from the VRMAC in whose area the wood is to be collected, at the price set by the VRMAC or at the prevailing Forest Department (FD) price per cord or per cubic meter. Also a conveyance fee shall be paid to the FD.
c. Only dead wood shall be collected for firewood.
d. No live tree shall be cut for firewood.
e. A special regeneration scheme for mopane found only in the north of the forest shall be explored.

4. ECOLOGICAL PRESCRIPTION

a. Firewood species can be regenerated from seed and by coppicing. However, it is only within the context of charcoal production that branches of firewood trees shall be collected green and then dried.

5. FINANCIAL ASPECTS

a. Permits are to be bought by commercial collectors of firewood. The Village Resource Management Area Committee shall be responsible for collection of permit revenue. The revenue collected shall be shared with Forest Department according to the agreed ratio (chapter 5).
b. The District Forest Officer shall collect a conveyance fee for commercial firewood (currently ZK1800 per cubic meter) to be paid by collectors to the Forest Department.

6. INDICATORS FOR MONITORING

a. Distances walked to collect firewood as reported by local village women to the VRMAC
b. Presence of firewood collectors at sites of barkhive and charcoal production
c. Number of people fined for felling fresh wood (monitored by the Village Resource Guards in each VRMA)
d. Amount of revenue collected from firewood permits and conveyance fees

FISHING

1. SPECIFIC OBJECTIVES

a. To improve water quality for fish
b. To encourage fish farming
c. To increase fish population in all the streams which are found in Chiulukire
d. To raise revenue from fishing permits

2. STRATEGY

a. Increase control over fishing activity.
b. Enforcing legal fishing ban between 1 December and 31 March.
c. Initiate a study to determine the importance and abundance of fishing in Chiulukire.
d. Create fishing reserves that are off-limits to fishing at all times.
e. Study the potential for constructing fish ponds around the forest.

3. LEGAL ASPECTS

The following regulations shall apply:

a. Fishing shall not be allowed anywhere in the forest during the first year so that fish stocks can be replenished.
b. When fishing resumes, using the following methods is prohibited:
    - poison
    - mosquito nets
    - explosives
    - oil
    - fish traps called moono (with the same effects as mosquito nets)
c. No fishing shall be carried out during the breeding period from 1st December to 31st March every year.
d. No fishing is allowed in the Reserved Areas described in chapter on Reserved Areas.
e. Fines shall be applied for breaking these regulations, and money from the fines will be under the charge of the VRMACs (see FINANCIAL ASPECTS).

4. ECOLOGICAL PRESCRIPTION

a. Stream bank erosion caused by cultivation along watercourses contributes to silting of the streams of Chiulukire. This tends to lower the volume of water in the streams. The low volume of water during the dry season affects the breeding cycle of fish, which only survive in isolated pools of water. Mtetezi river, Kamiza, Chavuzi, Mkangazi, Zinaka, Mponda, and Mthiko streams are all affected by silting. This is the main reason for prohibiting agriculture along streambeds (see chapter on Watercourses).
b. Fishing within the Reserved Areas (see Reserved Areas chapter) is prohibited.
c. Fishing with mosquito nets or other fine nets is prohibited.

5. FINANCIAL ASPECTS

a. Once fish stocks are replenished, fishing shall be restricted to Chiulukire villagers who have followed a sensitization program and been placed on the annual VRMAC fishing register. Their fish must not be sold.

b. However, if any person is caught fishing during the breeding months (December, January, February, March) or during the proposed moratorium of one year, or if any person is caught fishing in the reserved areas, fines shall be levied according to Zambian law and the money shall come back to the VRMAC at 100%.

6. INDICATORS FOR MONITORING

The Village Resource Management Area Committees through the Village Resource Guards shall monitor fishing activities. The following monitoring indicators shall be used:

a. Availability of fish in the seven principal streams of Chiulukire, as reported by fishing groups

b. Number of cultivators chased from streambeds

c. Volume and clarity of water in streams, as reported by fishing groups

d. Number of cases of illegal fishing methods reported and fined by VRGs

Fish, an important source of protein, do survive in some isolated pools of Chiulukire streams when they are not over-silted.

FRUIT TREES

1. SPECIFIC OBJECTIVES

a. To preserve a minimum of fruit trees in each VRMA to satisfy the dietary needs of households by
   - allowing a certain number of fruit seeds to ripen and regenerate
   - monitoring regeneration of fruit trees as the years pass
   - not allowing entire trees to be cut down for the sake of collecting fruit

b. To minimize waste of collected fruits by
   - only collecting what is needed for home consumption
   - only collecting fruit for sale for known markets
   - developing drying methods for longer storage times

c. To minimize conflicts with other users of fruit trees, notably:
   - medicine practitioners -- especially *Lannea* (shaumbu), *Flacourtia* (nthudza), *Ziziphus* (mshabankhunzi), *Diospyros* (mchenja)
   - charcoal producers – especially *Diospyros;* and that fires do not destroy fruit trees

2. LEGAL ASPECTS

a. There is no permit required to collect fruits from the forest; however, collectors must follow the sensitization program for fruit collection before being placed on the VRMAC annual register of collectors.

b. Commercial activity is too minimal to levy a fee on fruit collection at the present time. However, fines shall be imposed by the VRMAC on fruit tree abusers, such as those who cut entire trees only to get the fruit.

c. In addition, any other forest user group who wants to harvest **fruit tree** products OR **wood** from the above-named species, which are traditionally used by fruit collectors, will be required to consult first with the women's collector group.

d. If the collectors in the northernmost village management areas (parts of Matunga, and Magobo) find that their supplies are short, they must

   (1) make arrangements with their southern neighbors for collection rights in more abundant areas;

   (2) collect from areas outside the forest; or,

   (3) arrange to barter for fruit from other parts of the forest in exchange for other goods.

3. ECOLOGICAL PRESCRIPTION

a. Most fruit trees are found in the southern 2/3 of the forest, and most in the area of Mkaika. Species there that are highly ranked are *Adansonia* (baobab), *Bridelia* (mkumbya), *Diospyros* (mchenja), *Flacourtia* (nthudza), *Garcinia* (matatane), *Hexalobus* (nkhandachembere), *Lannea* (shaumbu and mbyulu), *Parinari* (mpundu), *Strychnos* (ntemya), *Uapaca* (msuku), and *Ximenia* (nthengele).

b. In the northern area, *Annona* (mpovya), *Diospyros, Flacourtia, Lannea, and Ximenia* are the main fruits noted.

c. INVENTORY DATA (see map at the end of this chapter):
   - In all areas of the forest, the number of fruit trees greater than 30 centimeters in diameter is very small; none were noted greater than 50 centimeters.
   - Regeneration in the 5-centimeter class is only fair in Zinaka, Chinkhombe, and Mkaika; Matunga and Magobo have a noticeable lack of small trees as well as large trees. However, there are some even younger fruit trees coming up in all parts of the forest. Therefore, one can suspect that late fires are playing a role in eliminating the next generation of fruit trees.
   - If the management plan fire regime is carried out, then the fruit user's group should be noticing an increase in regeneration of young trees.

4. FINANCIAL ASPECTS

a. For the time being, there will be no fees paid for collecting fruit. (Collectors must be registered with the VRMACs.) However, fines may be imposed for wasting fruit on a grand scale and for cutting trees simply to collect fruit. The fines will be levied by the VRMAC.

b. Any revenues from fines may be used to educate user groups on ways to avoid waste and increase storage time.

5. INDICATORS FOR MONITORING

a. It will be up to the women's fruit collection group to monitor

   - regeneration survival,

   - tree misuse and cutting for the wrong reasons,

   - over-harvesting of fruit so that no regeneration is allowed to germinate from seed,

   - young trees destroyed by fire.

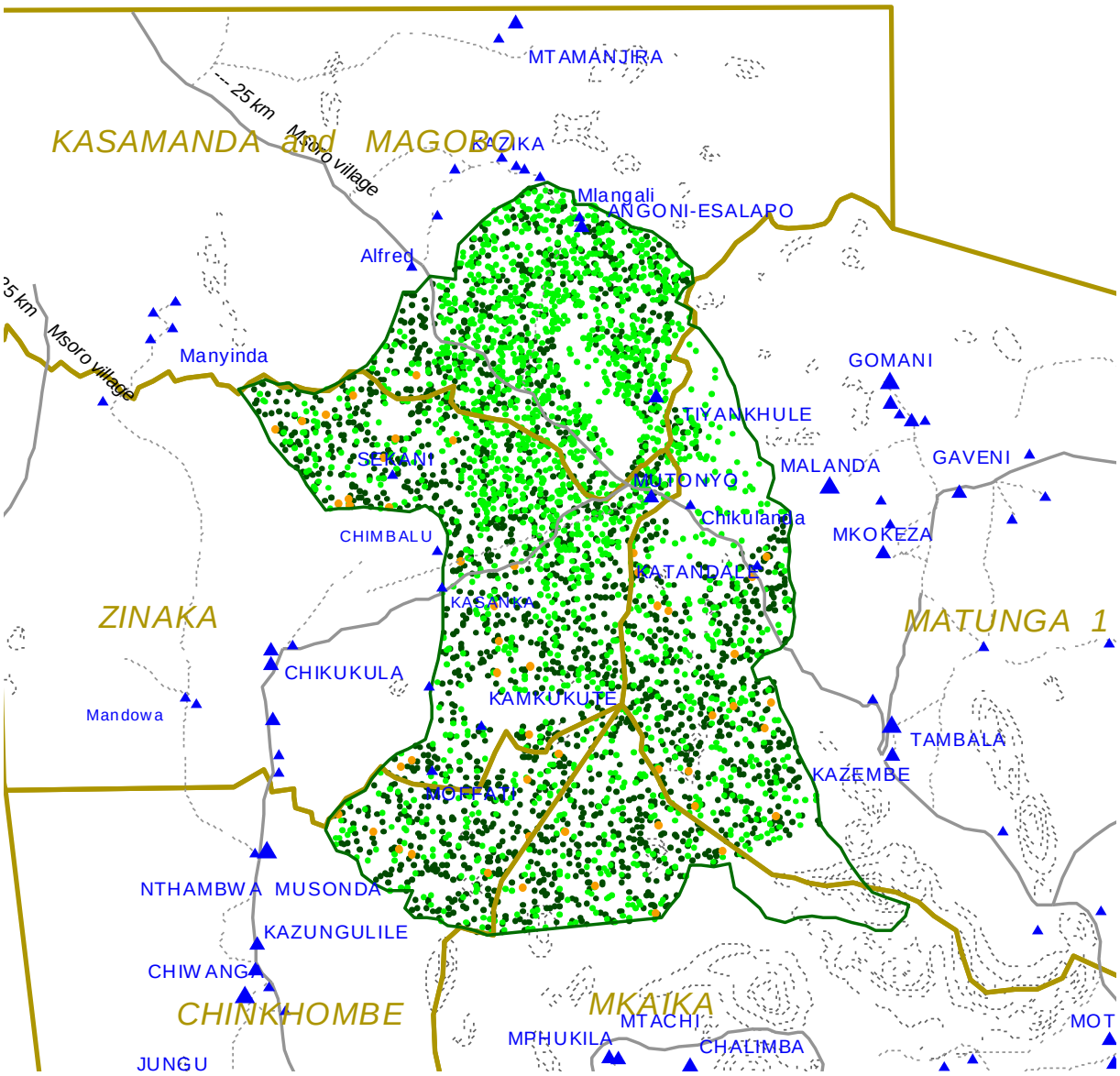
b. The proposed method is to practice looking right and left off the trails to the fruit trees to notice regeneration. Also young trees near the base of the seed trees should be noticed and followed over the years.

c. All fruit **collectors** and the Village Resource Guards are to report misused and damaged fruit trees noticed during the season of collection.

Fruit map

FRUIT TREE DENSITY
CHIULUKIRE LOCAL FOREST
Bridelia, Diospyros, Lannea, Strychnos, Ximenia

Density by diameter class, based on July 2000 inventory



FRUIT TREE DENSITY

35cm AND 45cm diam. class ✱ 100 TREES

15cm and 25cm diam. class ✱ 100 TREES

5cm diam. class • 100 TREES

GRAZING

The map at the end of this chapter shows livestock density outside, and fodder tree density inside, the forest.

1. SPECIFIC OBJECTIVES

a. To increase the availability and regeneration of fodder species, especially outside the forest in a "buffer zone"

b. To control grazing inside forest so that other uses of fodder trees are not compromised.

2. STRATEGY

a. Designated grazing areas will be agreed upon and set up during the first year. The areas must not conflict with charcoal, honey, mushroom, or sawtimber production, and they must not be located near the reserved areas.

b. Cattle owners must go through a sensitization program before being allowed to graze inside the forest.

c. Designated months when grazing is not allowed will be established by the VRMACs in order to favor tree regeneration.

d. Some areas may allow concentrated grazing as a form of firebreak.

e. Fodder banks and water points are to be set up outside the forest reserve at village level to reduce the need for forest pasture and water in the dry season.

f. Maximum herd sizes and penalties for exceeding them, if deemed appropriate, will be set by each VRMAC to limit negative impacts on regeneration and wildlife.

3. LEGAL ASPECTS

The Village Resource Management Area Committee through the Village Resource Guards and the grazing user groups shall be responsible for enforcing regulations in the forest:

a. Cattle only (no sheep or goats) shall be allowed to graze in designated areas and designated months inside the forest reserve with a permit, on a trial basis (first two years). The VRMAC will document cattle owners and the size of their herds once sensitization has been completed.

b. No livestock shall be allowed to graze in the reserved areas and at reserved waterpoints at any time (refer to map of reserved areas).

c. Cattle from villages not participating in the Joint Forest Management Plan are not allowed in the forest.

d. No late burning to produce pasture shall be allowed.

e. Any undocumented livestock that trespasses through the forest shall be impounded and the owner will be fined a fee set by the VRMAC.

f. Animals belonging to interior villages waiting for relocation to outside the forest must be kept in kraals at night.

g. Monitoring shall be done by the Village Resource Guards and by interested user groups to ensure that no area is overgrazed and that tree regeneration is not unduly affected.

h. If this experimental grazing policy appears to cause too much damage to other forest resources, grazing will be discontinued and an alternative to finding browse will be established in the buffer zone.

4. ECOLOGICAL PRESCRIPTION

Chiulukire local forest has good stocking and distribution of fodder species (see map). Most of these species have the potential to regenerate from stumps and root suckers. The following table shows the Chiulukire fodder species that are preferred for livestock:

ECOLOGICAL PRESCRIPTION – PREFERRED FODDER TREES:

SCIENTIFIC NAME	LOCAL NAME	ATTRIBUTES
Acacia albida	Msangu	Palatable, high crude protein, sprouts readily, but rare
Albizia harveyi	Mpalankhanga	Palatable
Bauhinia petersiana	Mpondo	Palatable, sprouts readily
Dicrostachys cinerea	*Kalumphangala*	High crude protein, palatable, but somewhat rare
Diplorynchus condylocarpon	Mtombozi, Mtowa	Palatable, sprouts readily, very common
Parinari curatellifolia	Mpundu	Palatable
Piliostigma thonningi	Msekese	Palatable, sprouts readily,
Pseudolachnostylis maprouneifolia	Msolo	High crude protein, palatable, sprouts readily
Strychnos spinosa	Mzimbili	crude protein, palatable, sprouts readily
Swartzia madagascariensis	Mchelekete	Palatable, sprouts readily, but rare
Ziziphus abyssinica	Kankhande	palatable

a. Early burning shall be carried out to encourage regeneration of the fodder species and grasses.

b. It is prohibited to graze rare plant species.

c. The livestock population is very high on the western side of the forest with Chinkhombe Village Resource Management Area having the highest concentration, especially of goats. This has resulted in increasing pressure on grazing areas and the forest reserve. Since goats are non selective browsers and cause more damage than cattle and pigs, *goats are prohibited from entering the forest reserve.*

5. FINANCIAL ASPECTS

The Village Resource Management Area Committees shall be responsible for collecting and managing any fines levied. Fines when imposed will be retained 100% by the Village Resource Management Area Committees.

6. INDICATORS FOR MONITORING

The Village Resource Management Area Committees through the Village Resource Guards, and designated herders, shall be responsible for monitoring grazing impacts, using the following indicators:

a. Noted impacts of overgrazing: shortage of regeneration, eroded soil, damaged trees

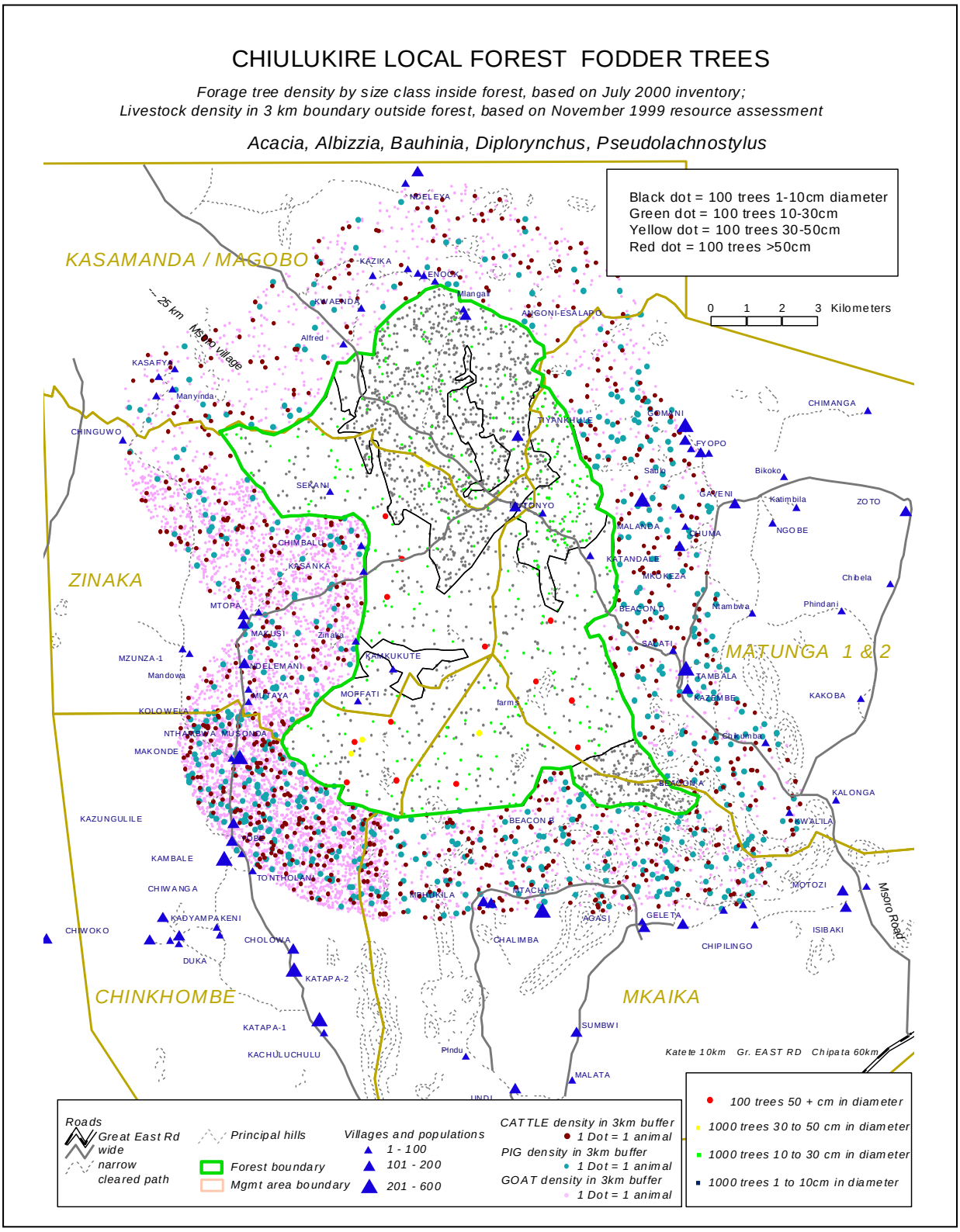
b. Number of infractions cited annually: late fires set by herders and livestock impounded

c. Number of fodder in banks outside the forest reserve

d. Availability of fodder in banks outside the forest reserve

e. Number of livestock impounded

f. Amount of money raised from fines.



HONEY AND BARKHIVE PRODUCTION

Maps presented at the end of this chapter show the abundance of bee forage and hivemaking trees currently inside Chiulukire Local Forest.

1. SPECIFIC OBJECTIVES

a. To promote marketing of honey, propolis, and wax
b. To sustain a strong level of honey production in Chiulukire Local Forest
c. To maintain bee forage regeneration
d. To maximize use of the trees consumed for barkhives

2. STRATEGY

a. Train people in good beekeeping methods and marketing.
b. To combine hivemaking with charcoal, medicine, sawtimber, carving, and construction pole exploitation
c. To organize beekeepers into user groups by VRMA or geographical location so that the numbers and names of beekeepers can be used for sustainable planning
d. To explore possibilities of using other materials for beehives

3. LEGAL ASPECTS

a. A permit shall be required to hang hives and crop honey inside Chiulukire Local Forest. For home use a maximum number of 6 hives per household per year may be maintained after obtaining a free permit.
b. For commercial use, a fee will be required by way of killing or felling trees to make barkhives (see Ecological Prescription).
c. The **number of commercial hives allowed per registered beekeeper** will start in the first two years at 10. Monitoring of regeneration of forage and hive trees, fire control, and level of adherence to rules (maximum hives and cropping months respected) will determine whether the number of 10 hives will be sustained beyond the first 2 years. Beyond 10 hives, they must be located outside the forest boundary.
d. Honey hunting (cutting or burning a tree to get at wild hives) shall not be permitted inside the forest and shall carry a fine of ZK10,000.
e. Fire and chemicals shall not be permitted when cropping honey.

4. ECOLOGICAL PRESCRIPTION

a. In order to allow proper regeneration of bees and pollination of flowers, honey shall only be harvested from April to June and October to December.
b. Cotton pesticides are known to be destructive to bees and beekeeping. Therefore, ***poisons used in cotton production must be kept at a distance of 200 meters from hives hung in trees.***
c. The preferred trees for bee forage in honey production are shown in the following table, and their regeneration is of interest to the beekeeper user groups.

PREFERRED BEEKEEPING FORAGE SPECIES

Acacia erioloba (mkunkhu)	*Diplorhynchus condylocarpon* (mtowa)
Adansonia digitata (mlambe)	*Julbernardia globiflora* (kamphoni)
Adenia senensis (mwanya)	*Lannea discolor* (shaumbu)
Afzelia quanzensis (mpapa)	*Pseudolachnostylis maprouneifolia* (msolo)
Brachystegia longifolia (bovu)	*Pterocarpus rotundifolius* (mbangozi)
Combretum molle (kalama)	*Sterculia africana* (mlele)
Dalbergiella nyasae (mkanganjovu)	*Terminalia sericea* (gonondo)

d. These species are currently well distributed in all the five Village Resource Management Areas; monitoring will therefore include an element of noting exaggerated mortality of these species and causes of the mortality.

e. *Julbernardia globiflora* and *paniculata* and *Brachystegia boehmii* and *spiciformis* are preferred for barkhive construction because they don't warp. However, they are also used for charcoal, firewood, and medicine. It is therefore proposed that hivemakers (who are required to kill trees to make their hives) join with charcoal producers to make their hives and assist in paying for *Julbernardia* and *Brachystegia* trees felled for charcoal.

f. Bees help in pollinating trees and crops. To maintain harmony in the colony and avoid absconding and migration of bees, the Queen Bee should be protected by assuring her food supply and physical cover: some honey and comb should be left in the hive when cropping, and the months of prohibited harvest should be respected (July-September and January-March).

g. The number of free barkhives allowed per household is tentatively set at SIX per year.

h. For commercial beekeepers (required to be "registered" and in "groups" for purposes of training and communications), a maximum average of 10 hives per year beekeeper (each hive replaceable every 4 years) is allowed. The table below shows the number of Beekeepers and the MAXIMUM NUMBER OF HIVES in each Village Resource Management Area:

NAME OF VRMA	NO. OF BEEKEEPERS	MAX. NO. OF BARKHIVES
MAGOBO	71	710
ZINAKA	54	540
MATUNGA	44	440
CHINKHOMBE	36	360
MKAIKA	25	250
TOTAL	**230**	**2300**

Assuming a rate of 1 hive per tree and hive replacement of once per 4 years, this indicates a necessity of felling (2300/4 =) 575 trees every year. It was found that these trees do exist in the forest currently, but their regeneration will have to be monitored closely by the hivemakers and by the charcoal producers alike. It is also assumed that some of the hive trees will be felled outside the forest boundaries.

i. If the above-mentioned 575 trees are cut every year, and an average number of sacks of charcoal contained in hive-sized trees is 1.5, then it is conceivable that

(575 x 1.5 =) more than 800 sacks of charcoal

are contained in the yearly allotment of hive trees. These trees shall be felled by permit only with the VRMAC for commercial exploitation.

j. Beekeepers with more than 10 hives currently inside the forest are obligated to move the surplus hives outside the forest boundary.
k. See the charcoal chapter for links to other users of hive trees.

5. FINANCIAL ASPECTS

a. The Village Resource Management Area Committees shall be responsible for issuing permits for hanging hives (both the household-use free permits and the commercial felled-tree paid permits). The paid permits are a percentage of the cost of the tree used to make charcoal: the charcoal-maker pays 75%, and the hive-maker pays 25%.
b. Honey that is processed and graded is of higher value than crude honey. Comb honey, pollen honey, water pollen honey and granulated honey all fetch different prices. User group training on processing and grading will be sought on demand.
c. Training on wax and propolis processed into medicines, polishes, and candles will be promoted on demand.
d. Revenue collected from honey and by- product sales shall belong to members of the beekeeping user groups.

6. INDICATORS FOR MONITORING

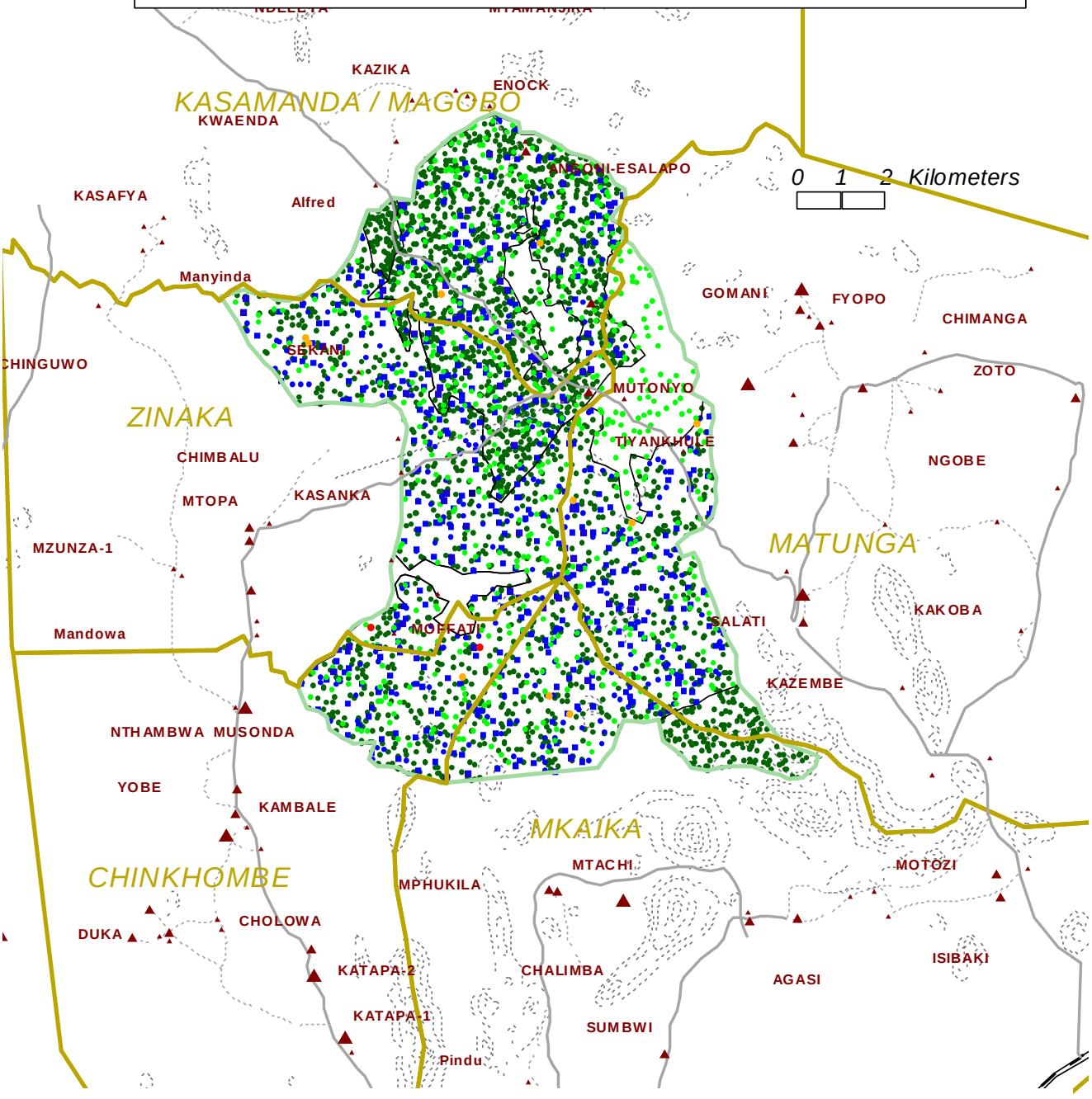
The Village Resource Management Area Committees and the beekeeping user groups shall be responsible for monitoring the beekeeping activities using the following indicators.

a. Numbers of beekeeping user groups and people in each group
b. **Quantity** and **quality** of honey produced by the groups (to be reported annually by groups to VRMAC)
c. Revenue raised by commercial beekeeper permits (documented by VRMAC)
d. Number of honey hunters caught and fined by the user groups and the VRGs
e. Regeneration of bee forage species (reported annually by user group to VRMAC)
f. Training in value adding and grading requested and carried out in the user groups; numbers of beekeepers trained.
g. Beekeepers with more than 10 hives currently inside the forest are obligated to move the surplus hives outside the forest boundary.
h. See the charcoal chapter for links to other users of hive trees.

Beekeeping is already a common source of household income in Chiulukire Forest.

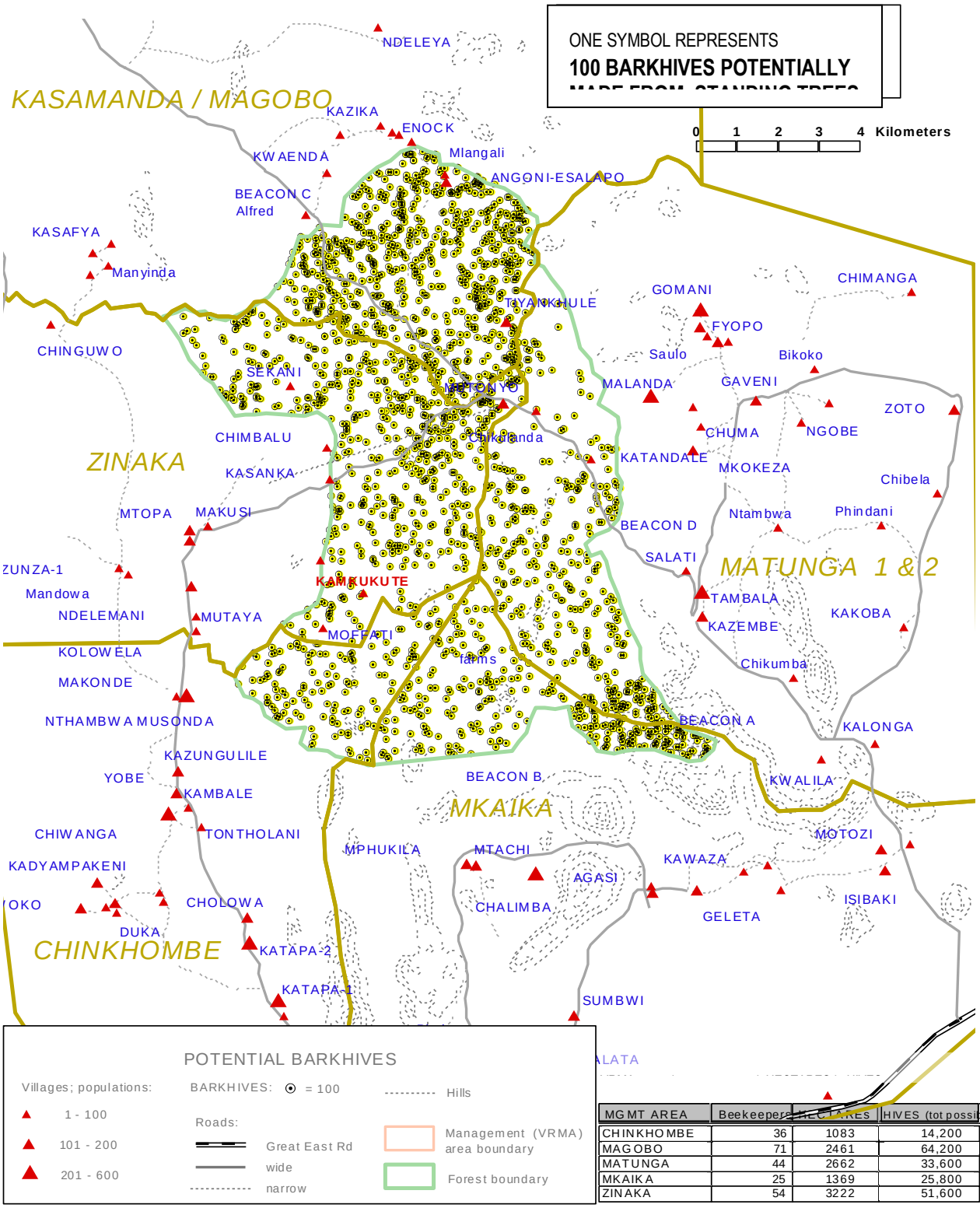
CHIULUKIRE LOCAL FOREST BEE FORAGE TREES

Brachystegias in blue; also Acacia, Combretum, Julbernardia, Diplorynchus, Lannea, Pseudolachnostylus, Terminalia



CHIULUKIRE LOCAL FOREST POTENTIAL BARKHIVE TREES

(Species: Brachystegia, Julbernardia; based on estimates of barkhives that could be made by beekeepers during July 2000 inventory)



MGMT AREA	Beekeepers	HECTARES	HIVES (tot possible
CHINKHOMBE	36	1083	14,200
MAGOBO	71	2461	64,200
MATUNGA	44	2662	33,600
MKAIKA	25	1369	25,800
ZINAKA	54	3222	51,600

MEDICINAL PLANT PARTS

1. SPECIFIC OBJECTIVES

a. To assure the long term supply of authentic medicinal plants found in Chiulukire local forest

2. STRATEGY

a. Regulate the use of certain rare important medicinal species, particularly mlunguchulu (*Zanthoxylem chalybeum)*
b. Provide educational campaigns in the villages on proper and legal harvesting methods of medicinal plants
c. Provide educational campaigns to user groups (for example charcoal producers) on conservation of medicinal trees

3. LEGAL ASPECTS

The following regulations shall apply when collecting medicinal plants:

a. Medicinal plants for domestic use shall be collected by registered, sensitized users only.
b. Ring barking plants when collecting medicine is prohibited.
c. Medicinal plants shall be protected against late fires.
d. Felling or killing trees for medicinal content is prohibited.

4. ECOLOGICAL PRESCRIPTION

a. Chiulukire local forest is endowed with a rich supply of plants whose roots, bark, and leaves are used for medicinal purposes. Improper harvesting of bark and roots can destroy plants.
b. The most important commonly used medicinal plants are in the following table:

LOCAL NAME	SCIENTIFIC NAME	LOCAL NAME	SCIENTIFIC NAME
changaluche	*Zanha africana*	mpalankhanga	*Albizia harveyii*
chipembele	*Xeromphis obovata*	msekese	*Piliostigma thonningii*
kankhande	*Ziziphus abyssinica*	mtondo	*Julbernardia paniculata*
mbwabwa	*Cussonia arborea*	mtukumphako	*Pavetta schumanniana*
mkanganjovu	*Dalbergiella nyasae*	mtunda	*Turraea nilotica*
mleza	*Cassia abbreviata*	nthudza	*Flacourtia indica*
mlombe, mukwa	*Pterocarpus angolensis*	shaumbu	*Lannea discolor*
mlunguchulu	*Zanthoxylem chalybeum*		

These species regenerate readily from seed, root suckers and stumps.

c. Herbalists should visit planned coupe and other cutting areas before trees are felled to extract products important to their trade.
d. The use of specific trees that are becoming rare due to overuse shall be regulated. In the immediate, this includes the following species:
    - ➔ Mlunguchulu (*Zanthoxylem chalybeum)*
    - Use of these species will require a special permit.
    - An informational campaign on these rare species shall be carried out by herbalists.

5. FINANCIAL ASPECTS

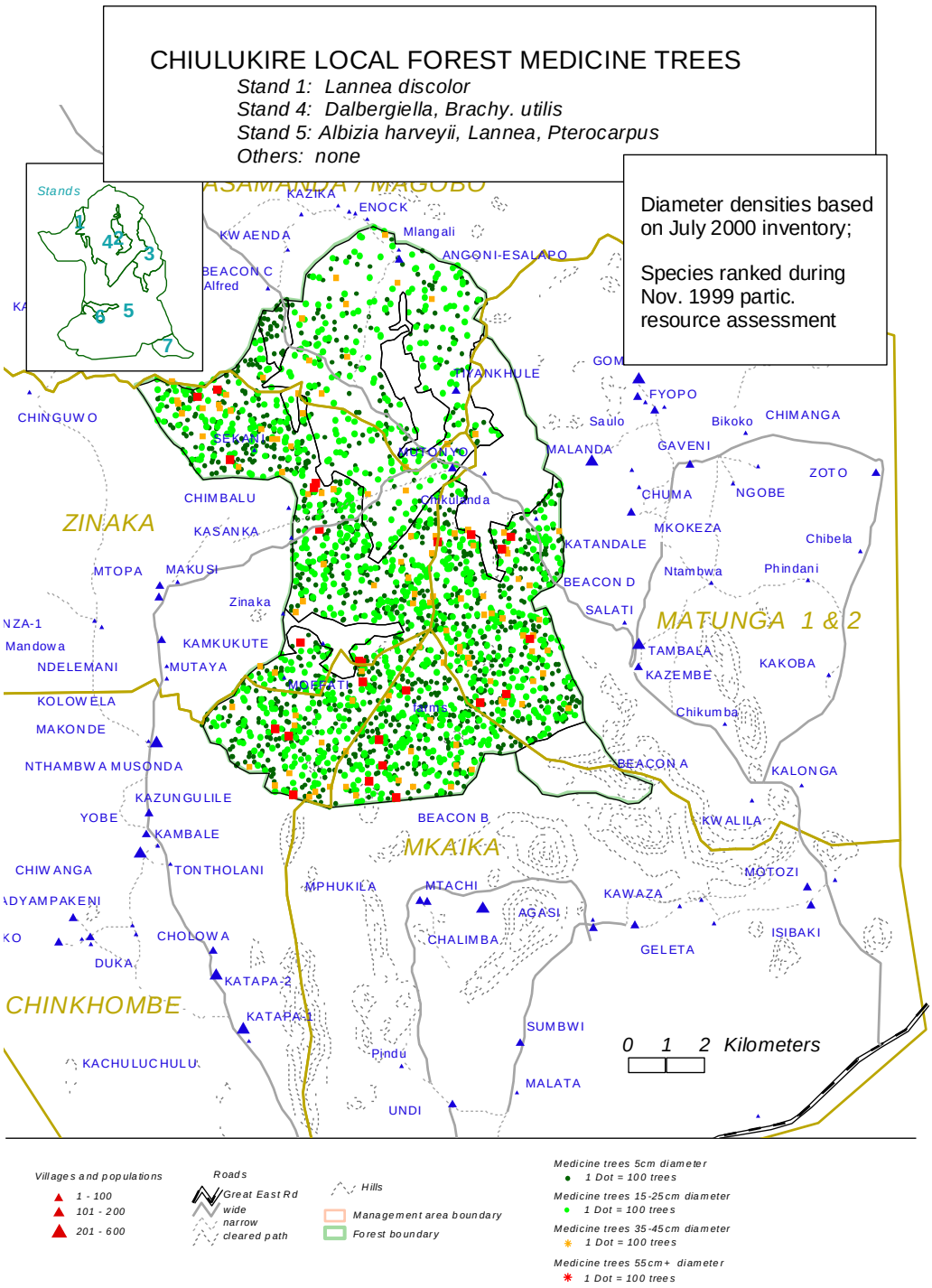
a. Medicinal plants shall be collected free from the forest as long as they are not sold outside Chiulukire area for profit. Professional herbalists must register as such with the VRMAC and receive instruction on ecological aspects before being added to the register annually.

b. In the event that any medicine sales grow to the point of becoming highly commercial, the VRMAC will decide on permit costs and procedures.

6. INDICATORS FOR MONITORING

a. The herbalist user group must monitor for any shortages of needed plants and keep the VRMAC informed.

b. If the Village Resource Guard can assist in observing proper use of medicine trees, the user group must make an arrangement with him to do so.



MUSHROOMS

1. SPECIFIC OBJECTIVES

a. To increase the availability of mushrooms in the forest reserve and buffer zone
b. To conserve trees which are associated with mushroom growth
c. To promote increased revenue from sale of mushrooms by adding value (drying, salting, spicing)

2. STRATEGY

a. Mushroom collectors should notify VRMACs of special areas for seasonal collection so that other harvesting operations do not destroy collectors' areas.
b. The user group can request training in value adding, with preference given to trainers within VRMAs.

3. LEGAL ASPECTS

a. Authority shall be sought from the Village Resource Management Area Committees for collecting mushrooms from the forest. FIRST PRIORITY FOR THIS ACTIVITY WILL BE GIVEN TO WOMEN AND CHILDREN RESIDING IN THE VRMAs.
b. The following activities shall not be allowed in mushroom collection areas:
    - Cultivation of fields
    - Late burning
    - Grazing of livestock
    - Production of charcoal
    - Cutting, felling, burning, or injuring trees associated with mushrooms

4. ECOLOGICAL PRESCRIPTION

a. Mushrooms are commonly found on sandy loam soils with associated vegetation. The mushrooms may require leaf litter, bark, or other organic matter associated with specific vegetation (especially trees), and thus the longevity of a mushroom crop being found in an area will depend on the continued presence of certain trees and their leaf fall.
b. In Chiulukire, most of the mushrooms are found in the Eastern and Southern parts of the forest and in buffer zone dambos. They grow through asexual reproduction: spores from the fruiting body are important for genetic diversity of mushrooms. Mushroom harvesting has little impact on the environment.
c. Late fires threaten leaf-cover required for some mushrooms to grow. Again, the importance of early burning instead of destructive late burning will play a role.
d. The table below shows the type of mushrooms found in Chiulukire local forest area and some known associated tree species. Since many of the associated trees correspond to charcoal trees, charcoal producers are required to inform mushroom collectors of their zone of work each year.

5. FINANCIAL ASPECTS

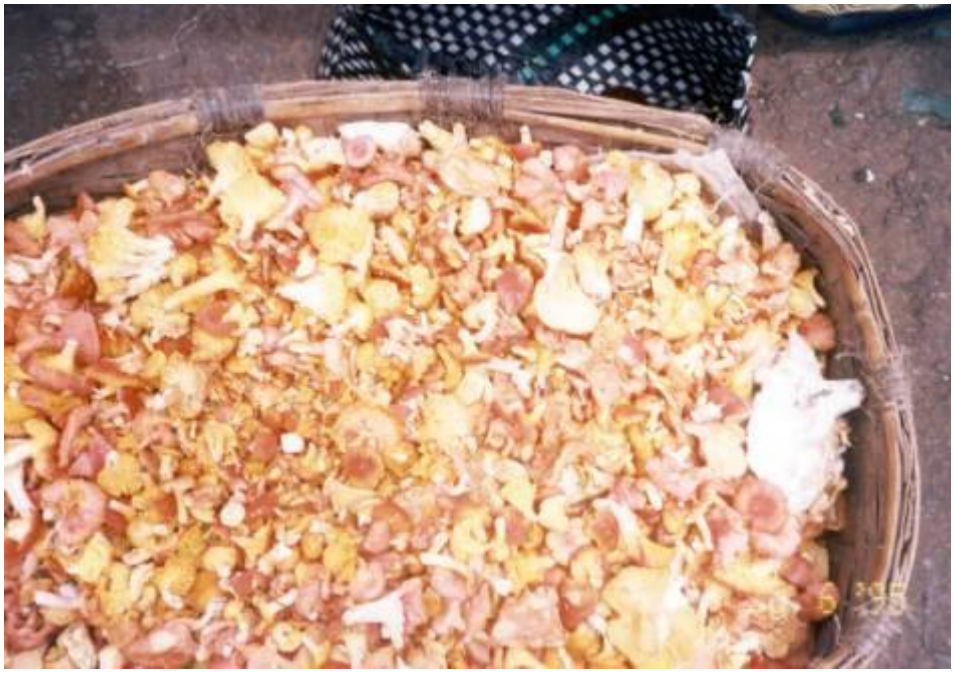
The mushroom collectors shall retain 100% of the revenue they generate from sales.

6. INDICATORS FOR MONITORING

Mushroom collectors shall be responsible for monitoring collection activities and reporting problems to the VRMAC. The Village Resource Guard shall also assist in monitoring.

The indicators for monitoring shall be as follows:

a. Availability of different edible mushroom varieties
b. Number of mushroom collection areas
c. Regeneration of species associated with mushrooms
d. Incidences of late fires



Mushrooms add to the diet and the household income.

SOME TREE SPECIES ASSOCIATED WITH MUSHROOM PRODUCTION

LOCAL MUSHROOM NAME	**SCIENTIFIC/ ENGLISH NAME**	**LOCAL NAME OF TREE SPECIES**	***SCIENTIFIC NAME OF TREE SPECIES***
Chipindi	*Russula* spp	Kamphoni Mkuti Gonondo Mgalilondo Msolo Msuku	*Julbernardia globiflora* *Brachystegia utilis* *Terminalia sericea* *Afzelia quanzensis* *Pseudolachynostylis maprouneifolia* *Uapaca kirkiana*
Manyame	*Cantharellus miniatescens*	Kamponi Mkuti Gonondo Mgalilondo Msuku	*Julbernardia globiflora* *Brachystegia utilis* *Terminalia sericea* *Afzelia quanzensis* *Uapaca kirkiana*
Ndelemya	*Amanita zambiana*	Msuku, Mgalilondo Msale	*Uapaca kirkiana* *Afzelia quanzensis* *Brachystegia bussei*
Kambakumbaku		Gonondo	*Terminalia sericea*
Kalawelawe		Mkanganjovu Chimphakasa Msuku Kasokolowe Mtombozi Mtondo	*Dalbergiella nyasae* *Lonchocarpus capassa* *Uapaca kirkiana* *Uapaca nitida* *Diplorhynchus condylocarpon* *Julbernardia paniculata*
Maso ang'ombe		Gonondo Kamponi Mgalilondo Bovu	*Terminalia sericea* *Julbernardia globiflora* *Afzelia quanzensis* *Brachystegia longifolia*
Bowafisi	*Termitomyces (letestui?)*	Gonondo Kamponi Mgalilondo Bovu	*Terminalia sericea* *Julbernardia globiflora* *Afzelia quanzensis* *Brachystegia longifolia*
Ndevuzababa		Gonondo Kamphoni Mgalilondo Bovu	*Terminalia sericea* *Julbernardia globiflora* *Afzelia quanzensis* *Brachystegia longifolia*
Nyonzwe	*Termitomyces clypeatus*	Gonondo Kamphoni Mgalilondo Bovu Mthethe	*Terminalia sericea* *Julbernardia globiflora* *Afzelia quanzensis* *Brachystegia longifolia*
Kachipande		Mtondo Kasokolowe Kansima Mzai Kamphoni Msale	*Julbernardia globiflora* *Uapaca sansibarica* *Strychnos cocculoides* *Julbernardia globiflora* *Brachysstegia bussei*
Lilime lang'ombe		Kamponi Bovu Mfendaluzi Mtondo	*Julbernardia globiflora* *Brachystegia longifolia* *Brachystegia boehmi* *Julbernardia paniculata*
Kanyendela		Mtondo Kasokolowe Mfendaluzi	*Julbernardia paniculata* *Uapaca nitida* *Brachystegia boehmi*
Bowakombo	*Termitomyces(letestui?)*	Mkanganjovu Gonondo Kasokolowe	*Dalbergiella nyasae* *Terminalia mollis* *Uapaca nitida*

POLES FOR CONSTRUCTION

1. SPECIFIC OBJECTIVES

a. To set aside certain tree species of specific sizes and form for use as construction poles (taking into consideration other suitable uses).
b. To utilize and sustain the supply of construction poles in Chiulukire local forest.
c. To promote alternative species.

2. STRATEGY

FIRST YEAR:

a. Study the number of poles needed for home use in Chiulukire villages and try to reserve this number.
b. Magobo and Zinaka will decide on a method to allocate, conserve, and regenerate their mopane (*Colophespermum mopane)* trees.

ALL YEARS:

c. Encourage use of live fences for gardens, for example chatata (*Cesalpina)* or sisal or cactus.
d. Use of exotic species such as Eucalyptus planted in woodlots at specific sites should be considered.
e. Use of alternative construction materials such as bricks and moulded soil should be encouraged to reduce pressure on the poles.

3. LEGAL ASPECTS

a. Only trees of prescribed diameter range and species shall be cut for use as poles. Taking into consideration their suitability for other more valuable uses, priority shall be given to future sawtimber trees.
b. Collection of construction poles for domestic use shall be done with by registering after sensitization with the VRMAC. Each household shall be allowed to collect 20 to 40 poles free per refurbished house.
c. *Swartzia madagascariensis* would be more valuable if cut for carving purposes. Therefore, it would be illegal to cut it for use as a construction pole. Likewise, the three top timber species *Pterocarpus angolensis, Khaya nyasica,* and *Pericopsis angolensis* must be left for timber purposes.
d. Fruit trees shall not be cut for poles. Temporary moratorium on ***phingo*** *(Dalbergia spp)* and mchelekete (***Swartzia madagascariensis)*** until regeneration level is established.
e. A permit shall be purchased for collection of poles on a commercial level.
f. For public (community) building projects, the VRMAC will be consulted for obtaining free poles.

4. ECOLOGICAL PRESCRIPTION

a. Harvesting of construction poles can be done in conjunction with charcoal coupes.
b. Regeneration of poles can be achieved from seed and coppice.
c. Zinaka and Magobo will pay particular attention to regeneration of mopane for pole and charcoal exploitation to avoid overuse of this species.

5. FINANCIAL ASPECTS

This is a table of pole prices as charged by the Forest Department.

Note: These prices are irrespective of species, as long as they are not from an exotic plantation.

Diameter class	Number of Fee units	Price per fee unit	Price per pole
7 -- 14 cm	1	K180	K180
15 – 19 cm	2	K180	K360
20 – 24 cm	3	K180	K540

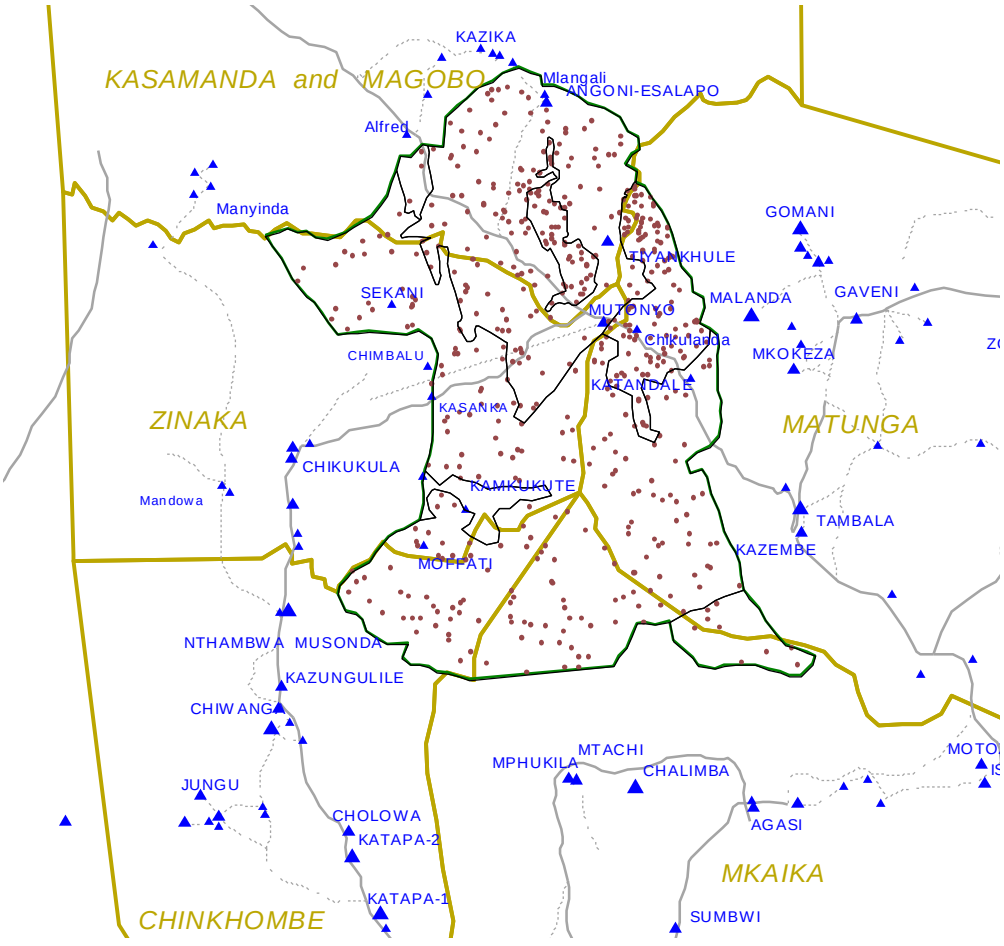
The Village Resource Management Area Committee shall be responsible for collection of revenue. The revenue collected shall be shared with the Forestry Department according to agreed ratios.

6. INDICATORS FOR MONITORING

The following indicators as recorded by VRMAC accounting shall be used to monitor the harvesting of poles:

a. Number of Poles of various sizes and species harvested in a particular period of time.
b. Number of infractions recorded (e.g. cutting primary sawtimber species for construction poles).
c. The amount of revenue raised from sales of poles.

POLE DENSITY
CHIULUKIRE LOCAL FOREST
Based on July 2000 inventory products called by village participants
SPECIES: Julbernardia, Brachystegia longifolia, Pericopsis, and Bauhinia



POLES

Pole density:
• = 1000 poles
Forest bound
Management areas

Roads
Great East Rd
wide
narrow

MGMT AREA	Hectares	TOTAL POLES
CHINKHOMBE	1083	36,925
MAGOBO	2461	15,5083
MATUNGA	2662	176,322
MKAIKA	1369	44,359
ZINAKA	3222	118,758

RESERVED AREAS

1. LOCATIONS AND OBJECTIVES OF RESERVED AREAS

On recommendation of the JFM Plan task force of village representatives, the following areas shall be created as reserves in Chiulukire Local Forest:

a. CHILIMA in south-central Chiulukire between Kamwala hill and Mwala olemba: an area of 100 hectares shall be reserved for breeding of animals and birds.

b. CHAMALENJE, situated in the northwestern section of the forest: an area of 50 hectares shall be reserved for breeding of animals and birds.

c. MWALA OLEMBA, or prehistoric rock paintings, located in the center of the forest between Mthiko and Kamalaza streams: a buffer zone of at least 200 meters radius shall be established around the paintings, in which no human intervention will be permitted (see legal aspects). The paintings are to be preserved for religious use and as a National Heritage site to be gazetted.

d. Corridors 200 meters wide linking the wildlife areas are to be drawn on the map. In these corridors, human activity is prohibited.

e. Waterpoints used by wildlife in the corridors and along less-protected streams will be identified by GPS, mapped, and again placed off-limits to human and livestock use.

f. A fishing reserve along the Mponda stream named Njeyrwa is a prime fish breeding area and should remain unfished.

2. STRATEGY

FIRST TWO YEARS:

a. The hunter groups will walk with foresters and interested VRMAC members to proposed sites to identify more precisely the limits of the reserved areas and the corridors between them.

b. The areas will be mapped and marked on photography of the forest.

c. The reserve locations and objectives will be presented to all the VRMA villages to ensure the needed collaboration.

d. An animal monitoring scheme as described in the wildlife chapter will be established.

e. National Heritage will be contacted regarding gazetting of the rock paintings.

3. LEGAL ASPECTS

a. The following activities are forbidden in the reserve areas:
   - cultivation of fields and growing of crops
   - felling, cutting, fashioning, burning, taking, collecting or removing forest produce
   - grazing of domestic animals
   - squatting, camping, residing or excavating
   - setting fire without express authority issued by the VRMAC or the Forest Dept.
   - hunting and setting of traps
   - fishing
   - using poisons for hunting or fishing
   - collection of bees, comb, honey, beeswax, or hanging of hives

b. The VRMAC or the Forest Dept shall not issue any licence for the forest produce in reserved areas.

c. All animals and birds in the reserved areas shall be protected: NO HUNTING of animals and birds shall be permitted for a period of three (3) years.

d. The Rock paintings shall be preserved for National heritage in accordance with the National Heritage Conservation Commission Act. No fashioning, defacing, engraving, burning, painting, or removal of any piece of rock shall be permitted.

4. FINANCIAL ASPECTS

a. The reserved areas shall be used for generating hunting revenue in the long-term. The VRMACs in which the areas are located shall be responsible for collecting revenues for hunting; however, if it is found to be an intolerably inequitable situation, the revenues may be shared among the several VRMACs.

b. If additional guards become necessary for purposes of monitoring wildlife off-take, hunting permit revenues will be used to engage necessary local scouts.

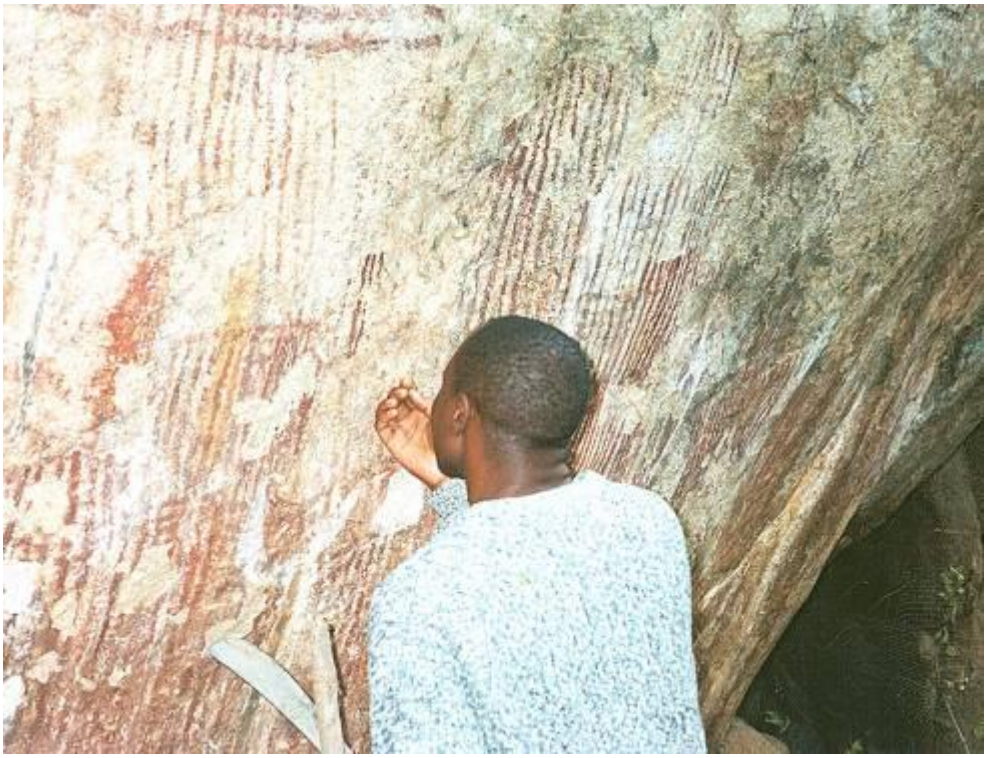
5. INDICATORS FOR MONITORING

a. Village Resource Guards, the hunters' groups, and the VRMACs will play important roles in monitoring success of the reserved areas. The JFM Steering Committee and Traditional Authorities will play important roles in informational campaigns and settling disputes.

b. The VR Guards need to visit the areas at least once weekly in the beginning months of the management plan until all parties are well-informed of the policies. Infractions reported should diminish with time. Each year, the number of infractions reported to the VRMAC and subsequently to the JFM Committee will indicate the level of success.

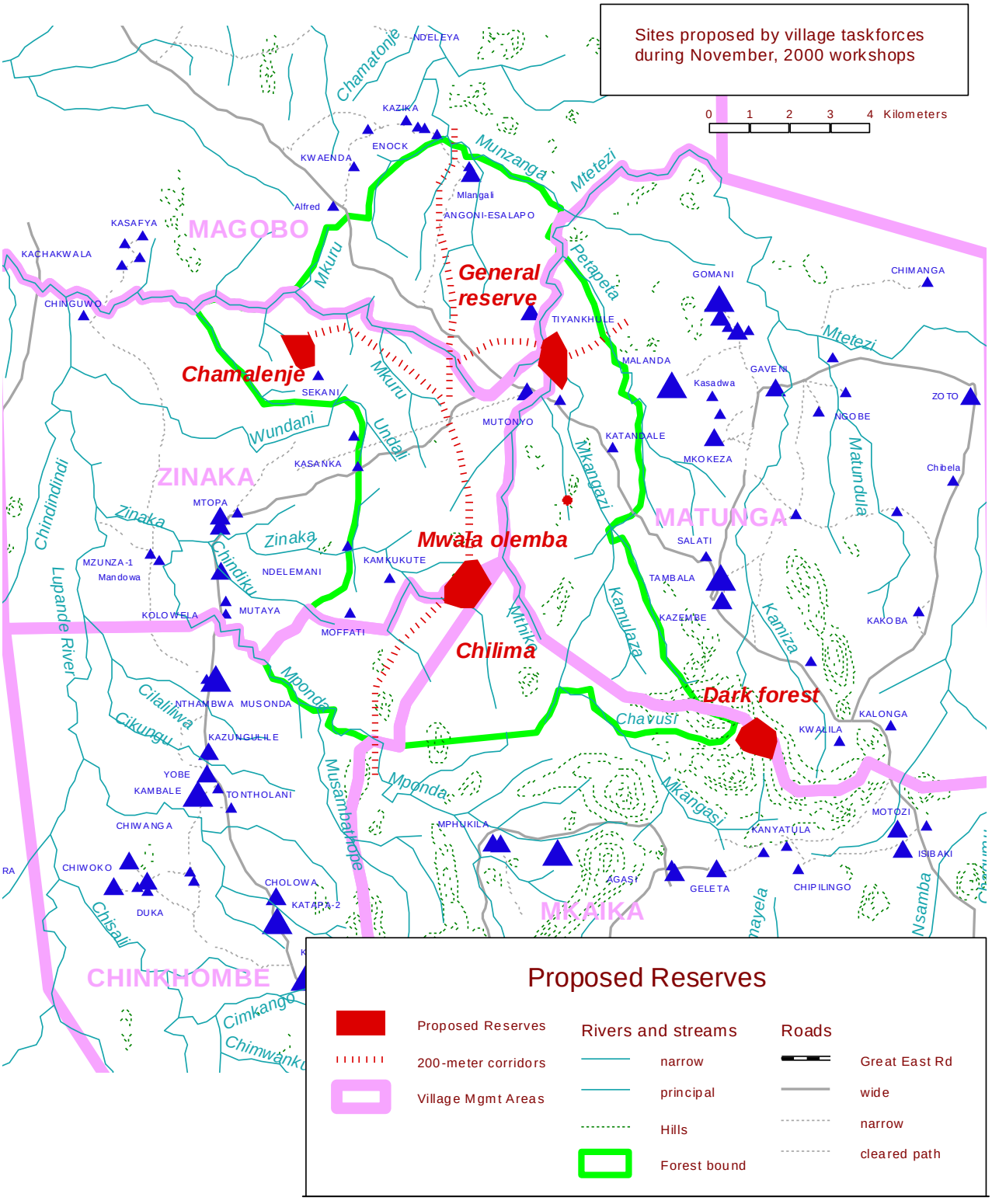
c. Special indicators can be set up by National Heritage and Matunga VRMAC where the Rock Paintings are located for monitoring of this resource.

d. Wildlife-related areas can be monitored using indicators described in the wildlife chapter.



The rock paintings inside Chiulukire Forest form one of the reserved areas.

CHIULUKIRE LOCAL FOREST
PROPOSED WILDLIFE AND PROTECTION RESERVES
Including wildlife regeneration areas and Prehistoric Rock Paintings



SUNDE BROOMS (VELLOZIA EQUISETOIDES)

INTRODUCTION:

Sunde grow mainly on rocky shallow soils. Their fiber is used to produce handheld brooms mostly marketed in Katete, Chipata, and Lusaka.

A study on broom economic activity in Chiulukire villages in year 2000 found the following:

1. A typical average harvest of brooms in 5 months of rainy season, when fibers are easy to extract, is a total of 135 to 335 plants per man.
2. A typical average harvest of brooms in 7 months of dry season, when fiber extraction is difficult, is a total of 55 to 85 plants per man.
3. This leads to an average harvest of 190 to 420 brooms per man over 12 months.
4. The 1999 Village Resource Assessment of Chiulukire villages found about 80 resident broommakers.
5. Thus an average annual harvest of broom plants for commercial sales in the area is about (80 men) x (190 to 420 brooms) = 16 200 to 33 600 brooms per year.
6. At a price of about ZK 300 to the producer (ZK 1000 to the buyer), this product is currently infusing 5 to 10 million kwacha per year into the local economy.
7. If a greater share of the broom market price could be retained, this infusion could double.

1. SPECIFIC OBJECTIVES

a. To verify and maintain a sustainable supply of brooms of good form in the forest.

b. To support equitable access and income from broom sales.

c. To search for a more direct marketing approach so as to keep a larger share of retail revenues in the local economy.

d. To promote a market for smaller-sized broom products.

2. STRATEGY FOR VERIFYING ALLOWABLE HARVEST

a. The number of brooms sold by permit will be as described under “Ecological prescription”.

b. Each year, the number of broom permits sold will be documented and the actual quantity of brooms leaving the forest will be reported.

c. At least two depots for commercially-bound brooms will be established to reconcile permits sold and brooms marketed.

d. Each year, regeneration and mortality in selected patches will be noted by users.

e. Shortages and increasing distances to commercial-quality brooms will be reported by user groups to VRMAs.

f. Changes to be made in current levels of harvest shall be recommended after annual monitoring and evaluation.

g. CLUSA will facilitate value-adding and marketing for sunde products.

h. Carry out research in biology and ecology of sunde to better understand its regeneration and sustainable harvest.

3. LEGAL ASPECTS

a. Sunde shall be collected by permit obtained from the VRMAC at an appropriate cost to be determined.

b. Brooms for domestic use shall be collected with a free permit. The maximum number of brooms per household allowed free is 3 (three) per year.

c. Any person who burns or collects brooms without a permit commits an offence and shall be fined ZK10,000 and the brooms will be confiscated by the VRMAC.

4. ECOLOGICAL INFORMATION AND PRESCRIPTION

a. DENSITY: Based on year 2000 inventory data, ¾ of the clustered plots in the northern half of the forest supported sunde, while only about half the clustered plots in the southern half did so.

b. EXPLOITATION LEVELS: The greatest pressure on the sunde population comes from Matunga area where the greatest number of broom makers and traders reside, where the average numbers of plants collected per person is two to three times as high as in other parts of the forest. Density of sunde per hectare in the Matunga-Chinkhombe belt is less than half that of the Zinaka-Magobo belt. The number of broommakers in the 5 VRMAs is estimated at 80 from the 1999 Village Resource Assessment, with the heaviest commercialization in Matunga.

c. GENETICS: Threats to the broom industry include overexploitation of the best-formed individuals. It is unknown if the genetic makeup of regeneration is being affected by exaggerated removal of long, straight plants. It is proposed to attempt some cropping of side-buds to encourage central shoot lengthening in some limited experimental areas to be established by VRMAC and the user group.

d. FIRES: Since the other principal threat to sunde regeneration is late hot fire, harvesters are required to clear debris to a distance of 1 meter around live plants and roots. The early burning regime must also be respected. Lastly, burning of live sunde for smoking beehives is prohibited; only dead sunde may be used for this purpose. Dead sunde have **no leaves growing out of the bud end**.

e. VEGETATIVE REGENERATION AND ROTATION AGE: One mode of regeneration is vegetative propagation by the oldest (multiple-budded) plants drooping to touch the ground and sending out shoots where they become rooted in the soil. Therefore it will be prohibited to cut sunde in this drooping state. It is estimated by some villagers that it may take 20 years for sunde to reach this level of maturity.

f. PROPOSED RATE OF HARVEST BASED ON INVENTORY, NUMBER OF BROOMMAKERS, HECTARES, AND CURRENT LEVEL OF EXPLOITATION:

SUNDE CURRENTLY IN THE FOREST: Based on year 2000 inventory, the numbers of brooms currently in the forest described by age (bud) class are as follows:

STAND	AREA NOT RSRVD (HA)	NO. OF PLOTS	1 – 3 BUDS		4 – 7 BUDS		8+ BUDS		DEAD PER HA
			PER HA	TOTAL (thous.)	PER HA	TOTAL (thous.)	PER HA	TOTAL (thous.)	
1	100	8	*1637*	163.7	*752*	75.2	*221*	22.1	1681
2	260	8	*973*	253.0	*221*	57.4	*133*	34.6	2522
3	300	8	*0*	0.0	*0*	0	*0*	0.0	0
4	2570	56	*543*	1395.5	*316*	812.1	*133*	341.8	1314
5	5890	52	*221*	1301.7	*88*	518.3	*27*	159.0	549
6	200	(NO PLOT)	-	-	-	-	-	-	-
7	415	8	*0*	0	*0*	0	*0*	0	0
TOTALS		***132***	***3113.9 thousand***		***1463.0 thousand***		***557.5 thousand***		

If we divide the current stock TOTALS by the estimated rotation length of 20 years to maturity, we get the following ***annually available stems***:

TOTALS DIVIDED BY 20 YEARS	1 – 3 BUDS	4 – 7 BUDS	8+ BUDS
	155,700	***73,150***	***27,875***

It may be assumed that plants with 1-3 buds are usually too short to exploit, and that a good percentage of plants with 8 or more buds may be in the vegetative propagation stage and thus off limits to harvest. This leaves the bulk of the crop to be harvested in the 4-to-7 bud group.

g. SUNDE NEEDED TO SUPPORT CURRENT BROOMMAKERS:

To arrive at a reasonable allowable harvest, it is proposed to make an objective "to sustain at least 80 broommakers from sunde in the forest and buffer zone". The average annual need per single broommaker, according to the year 2000 survey, is about **100 to 400 plants per year,** summing for 5 months of rainy-season production plus 7 months of dry-season production. The annual need to be sourced is thus

(80 harvesters) x (200 to 400 plants per harvester) = 16,000 to 32,000 plants per year

According to the inventory, these sunde do exist currently inside the forest and buffer zone (though it is not certain what percentage of the plants are of proper form for exploitation).

It is therefore recommended that the VRMACs be provided with sufficient permits for each of the first two years for A MAXIMUM 400 PLANTS PER PERSON x 80 PERSONS = 32,000 PLANTS, to be divided proportionately among the number of BROOMS (NOT number of broommakers) in each VRMA thus:

VRMAC	**NUMBER OF SUNDE WITH 4-7 BUDS INSIDE FOREST**	**NUMBER OF PERMITS/YEAR**	**MAX NUMBER BROOMS/YEAR**
CHINKHOMBE	92,800	4.76 OR **5**	2,000
MAGOBO	763,700	39.13 OR **39**	15,600
MATUNGA	172,100	8.82 OR 9	3,600
MKAIKA	98,100	5.03 OR 5	2,000
ZINAKA	434,500	22.26 OR 22	8,800
TOTALS	***1,561,197***	***80***	***32,000***

The reason for proportioning the number of permits by VRMA density of brooms, and not by number of broommakers, is to avoid overexploiting the brooms in VRMAs that are already in short supply. Thus broommakers are still assured of meeting their needs, while doing so in the best-supplied VRMAs.

h. After each of the first years, observations will be made by the user group and the VRGs on the success of sunde regeneration and early burning. The VRMAC will be required to monitor the number of brooms leaving the forest area to compare with the numbers and amounts sold on their permits.

i. In the annual reports, recommendations will be made by the VRMAC and the user group on whether the prescribed number of permits should continue as above, or whether the methods or numbers should change.

5. FINANCIAL ASPECTS

a. VRMACs shall be responsible for setting the prices of, and collecting revenue from, commercial broom harvesting permits. The VRMAC shall retain 100% of the revenues collected.

b. Broom collectors themselves are to do the processing and value adding before marketing the brooms (unfinished plants are not to be sold to outsiders).

Money raised from the sale of brooms shall belong to individual members of the user groups.

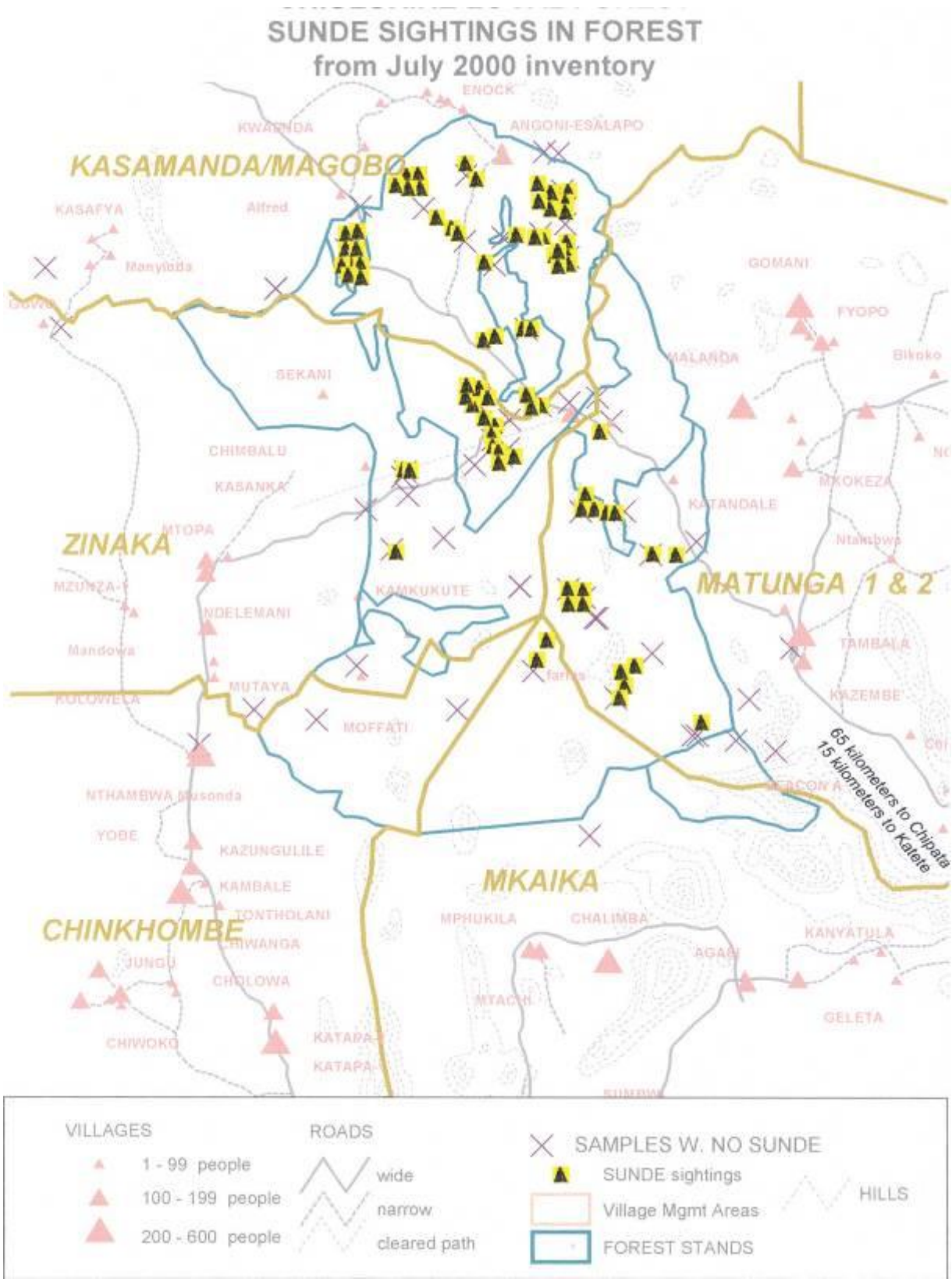
6. INDICATORS FOR MONITORING

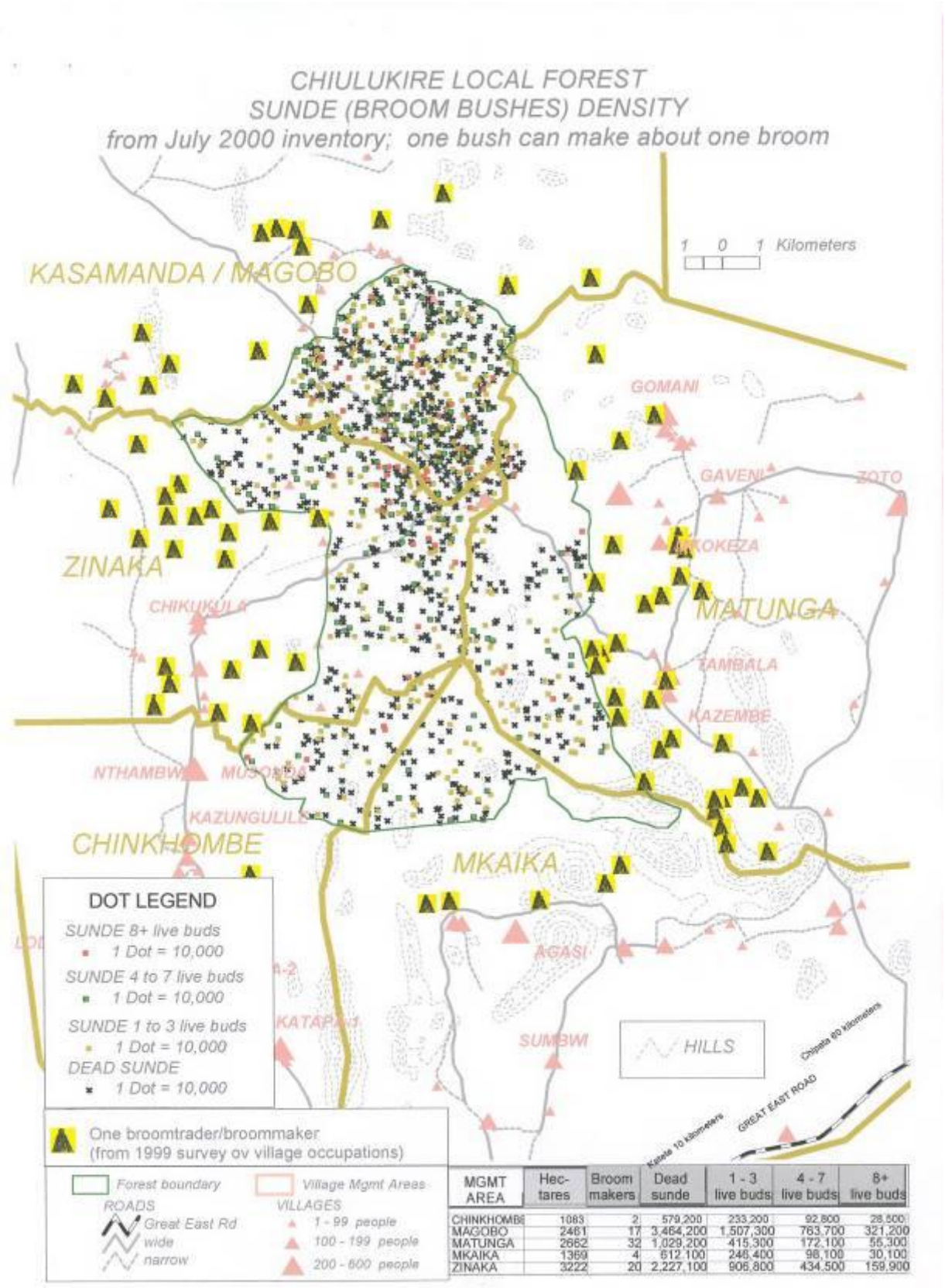
a. The VRMACs shall be responsible for quantifying commercial exploitation activities for the JFM Steering Committee for annual reporting. This includes summarizing information on permits by month, area, and year, and counting broomloads/bundles going out of the forest on the way to market.

b. Regeneration and mortality of sunde in selected patches will be monitored by Village Resource Guards and user group members. Excessive reports of late burns, uncleared areas around live sunde in work areas, harvest of older plants already in the drooping stage, or harvesting beyond what is permitted by the VRMAC will result in changing the quantities allowed for annual harvest, or will result in expulsion of habitual offenders from the user group.

c. At least two broom depots (one in Magobo and one in Tambala) will be established to monitor sunde exploitation.

Brooms made from sunde bushes in Chiulukire Forest form a lucrative business.


SUNDE SIGHTINGS IN FOREST
from July 2000 inventory
KASAMANDA/MAGOBO
ZINAKA
MATUNGA 1 & 2
MKAIKA
CHINKHOMBE
65 kilometers to Chipata
15 kilometers to Katete
VILLAGES
1 - 99 people
100 - 199 people
200 - 600 people
ROADS
wide
narrow
cleared path
SAMPLES W. NO SUNDE
SUNDE sightings
Village Mgmt Areas
FOREST STANDS
HILLS



MGMT AREA	Hec-tares	Broom makers	Dead sunde	1 - 3 live buds	4 - 7 live buds	8+ live buds
CHINKHOMBE	1083	2	579,200	233,200	92,800	28,500
MAGOBO	2461	17	3,464,200	1,507,300	763,700	321,200
MATUNGA	2662	32	1,029,200	415,300	172,100	55,300
MKAIKA	1369	4	612,100	248,400	98,100	30,100
ZINAKA	3222	20	2,227,100	906,800	434,500	159,900

j. After each of the first years, observations will be made by the user group and the VRGs on the success of sunde regeneration and early burning. The VRMAC will be required to monitor the number of brooms leaving the forest area to compare with the numbers and amounts sold on their permits.

k. In the annual reports, recommendations will be made by the VRMAC and the user group on whether the prescribed number of permits should continue as above, or whether the methods or numbers should change.

5. FINANCIAL ASPECTS

c. VRMACs shall be responsible for setting the prices of, and collecting revenue from, commercial broom harvesting permits. The VRMAC shall retain 100% of the revenues collected.

d. Broom collectors themselves are to do the processing and value adding before marketing the brooms (unfinished plants are not to be sold to outsiders).

   Money raised from the sale of brooms shall belong to individual members of the user groups.

6. INDICATORS FOR MONITORING

d. The VRMACs shall be responsible for quantifying commercial exploitation activities for the JFM Steering Committee for annual reporting. This includes summarizing information on permits by month, area, and year, and counting broomloads/bundles going out of the forest on the way to market.

e. Regeneration and mortality of sunde in selected patches will be monitored by Village Resource Guards and user group members. Excessive reports of late burns, uncleared areas around live sunde in work areas, harvest of older plants already in the drooping stage, or harvesting beyond what is permitted by the VRMAC will result in changing the quantities allowed for annual harvest, or will result in expulsion of habitual offenders from the user group.

f. At least two broom depots (one in Magobo and one in Tambala) will be in established to monitor sunde exploitation.

THATCHING GRASS

1. SPECIFIC OBJECTIVES

a. To sustain accessibility of thatching grass

b. To promote regeneration of thatching grass in the forest and buffer zone by use of early burning

c. For any surplus grasses, to promote commercialization of the resource to Katete, Chipata, and other markets

2. LEGAL ASPECTS

a. Thatching grass for domestic use shall be collected free. However, commercial collectors shall pay for thatching grass at a fee to be set by the VRMAC.

b. Late fires shall not be allowed in grass collection or any other area of the forest, and early burning should be preceded by thatch collection.

3. ECOLOGICAL PRESCRIPTION

a. Hyparrhenia (nyumbu) and tsekela grass species found in Chiulukire are used for thatching houses. These grass species are found in open areas of the forest and buffer zone near dambos and stream banks. Regeneration is not affected by early burning between May and June; however, repeated late burning can be detrimental.

b. Collectors are to harvest grass before the onset of early burning as announced by the traditional authorities or the Forest Department.

4. FINANCIAL ASPECTS

a. Thatching grass is used extensively as roofing material and has some economic potential outside the forest, according to a study made in 2001. If a commercial operation should commence, the VRMAC will decide on the price of a permit to do so and the revenue shall be retained 100% by the VRMA.

b. Priority must remain with domestic needs for thatch; therefore, if shortages of roofing materials are reported to the VRMAC by the villages, commercial activity must be curtailed.

5. INDICATORS FOR MONITORING

Village Resource Management Area Committees will hear reports of thatch shortages through village representatives and through the Village Resource Guards on a seasonal basis. The following indicators for monitoring activities may also be used:

a. Continued availability of thatching material as reported by local roofers

b. Amount of revenue raised from any commercial operations

c. Incidences of late fires reported by VR Guards

WATERCOURSE MANAGEMENT

This chapter on watercourses arises from villagers noting the disappearance of permanent water sources and the silting of streams essential to their livelihoods.

1. SPECIFIC OBJECTIVES

a. To protect the functions served by Chiulukire watercourses, including:
   - provision of irrigation water for year-round gardening downstream in dambos
   - maintenance of high water tables for village bore-holes and livestock watering holes
   - maintenance of viable fish and wildlife populations
   - health and sanitation provided by moving clear water

b. To reduce stream bank erosion and silting of streams including the Mponda, Mthiko, Mkangazi, Chavuzi, Mtetezi, Zinaka, Petapeta, Undani, Mkuru, and Kamulaza and their branches

c. To reduce pollution of watercourses by controlling use of chemicals near channels

2. STRATEGY

a. To purify streams and replenish fish stocks, each Village Resource Management Area shall identify and set aside areas outside the forest for gardens currently inside, to be relocated.

b. People and livestock shall have designated water points apart from each other.

c. Essential water points inside the forest will be referenced on the map as being either for domestic or wild animals (see chapter on wildlife reserves).

d. Construction of livestock water points and fishing ponds shall be encouraged outside the forest.

3. LEGAL ASPECTS

a. Gardens and fields along watercourses inside the forest shall be relocated outside within a reasonable time-frame to be decided during adoption of the management plan.

b. No pesticides shall be used along watercourse edges.

c. The ecological prescriptions described below shall be legally binding.

4. ECOLOGICAL PRESCRIPTION

a. Several streams in Chiulukire stop running in May but leave isolated pools through the dry season. These water points and pools shall be conserved for the benefit of people, animals, birds, aquatic plants and fish according to location.

b. Inside the forest, a strip of vegetation 30 meters wide on each side shall be preserved along stream banks to control soil erosion and conserve water. This means that livestock is not allowed to graze there, that tree harvesting is to be greatly restricted, and that all cultivation is prohibited there. However, collection of thatch and firewood may be allowed on a trial basis to reduce the fire danger there.

c. Harvesting of sawtimber and other trees from inside galleries will be severely restricted, will be subject to approval of the Forest Department, and must follow the rules described under the pitsawing chapter for leaving seed trees. This includes complete protection (no possibility of cutting) of *Khaya, Afzelia, Swartzia*, and other trees deemed rare by the Forest Department.

5. INDICATORS FOR MONITORING

The Village Resource Guard will be patrolling some watercourses and water points during his rounds. Illegal activities (livestock grazing on banks, livestock watering at wildlife water points, hunting in reserves, illegal gardens, tree cutting in galleries) will be reported to the Village Resource Management Area Committees.

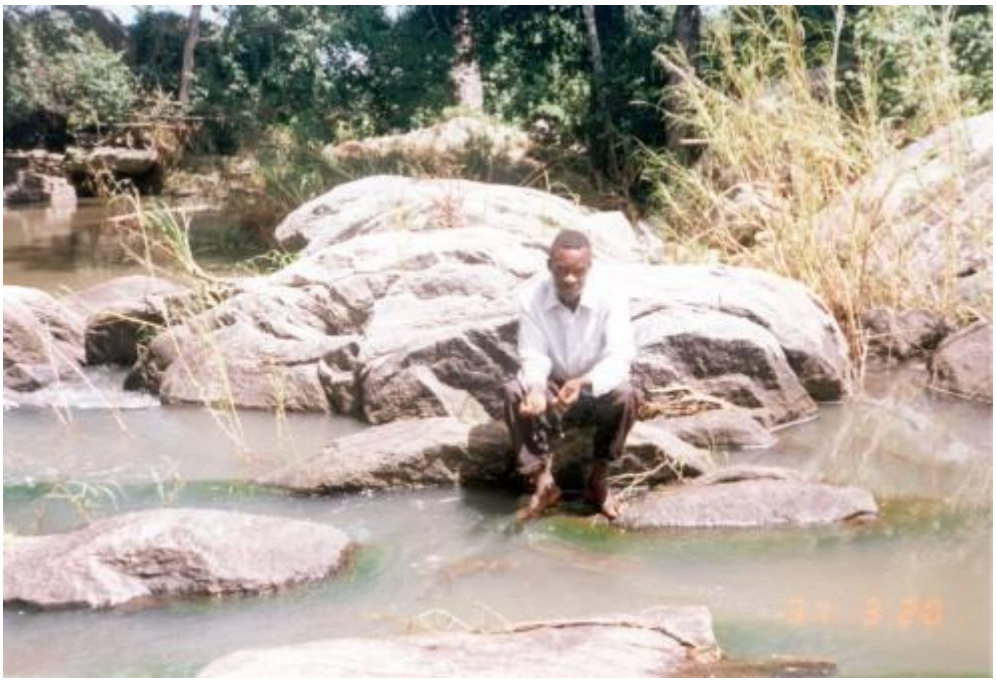
Some of the indicators for monitoring are as follows:

a. Quality and availability of water noted by surrounding villages and reported to the VRMACs

b. Incidences of stream bank erosion evidenced by silting reported by villagers, fishermen, and by the Village Resource Guards

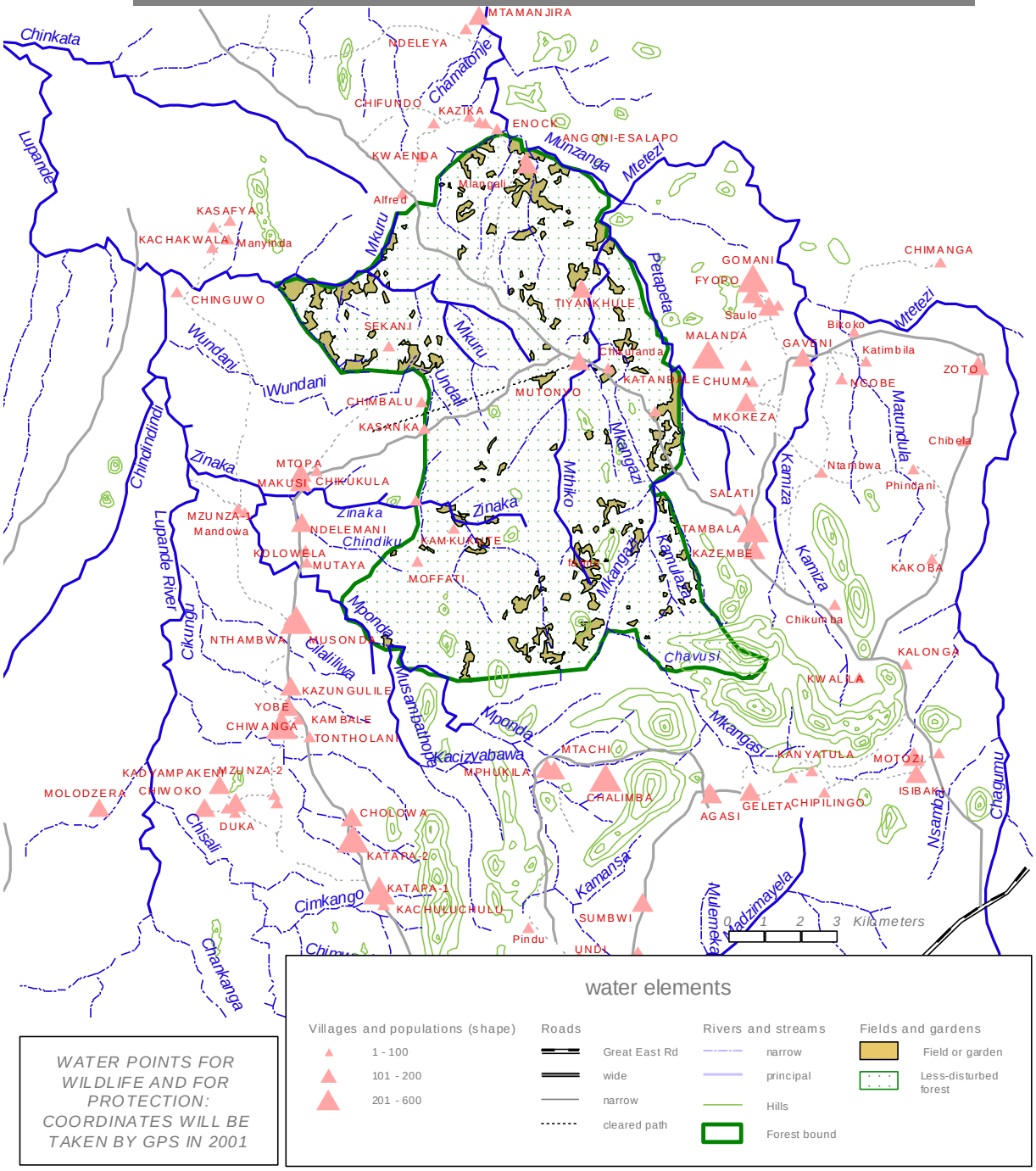
c. Hectares of gardens relocated outside the forest (reported by headmen to VRMACs)

d. Incidences of fish and other water poisonings noted by VRGs.



Mponda stream forms part of Chiulukire's southwestern boundary; silting and bad fishing practices are threats to its flow and to its fish.

WATERCOURSES, GARDENS AND FIELDS
CHIULUKIRE LOCAL FOREST
Based on 1999 SPOT satellite image interpretation and Village Resource Assessment sketch maps



WILDLIFE

1. SPECIFIC OBJECTIVES

a. To rehabilitate wildlife population in Chiulukire forest
b. In the long term, to generate income for the benefit of the community from game hunting
c. To protect Wildlife and its habitat in reserved areas of Chamalenje, Chilima and Magobo
d. To increase the Wildlife population in Chiulukire

2. STRATEGY

a. In order to increase the population of animals and birds, three areas and the corridors between them shall be set aside for habitat and breeding purposes: Chamalenje, Chilima and an area in Magobo. See the above chapter on reserved areas and corridors for information on hectares and locations. No hunting shall be allowed in these areas.
b. There shall be no hunting during at least the first three years of the Forest Management Plan implementation in order to facilitate a simple counting of the animal populations. The VRMACs will work in collaboration with the hunter's groups and Zambia Wildlife Authority to carry out a population assessment after three years of plan implementation. Alternatively, a picture/symbol-based trend-documenting scheme may be implemented along designated wildlife routes and visited weekly or monthly to get a baseline of numbers of animals present.
c. After the first three years, the VRMACs in collaboration with Zambian Wildlife Authority, the hunters' groups, and the Joint Forest Management Committee shall
    - evaluate the issuance of licences and determine the number of animals to be hunted, and
    - consider the possibility of applying to Zambian Wildlife Authority as a Community Resource Board under Part III Section 6.

3. LEGAL ASPECTS

a. Wildlife in Chiulukire shall be managed in accordance with the Zambia Wildlife Act No.12 of 1998.
b. Hunting without a licence is prohibited.
c. The Village Resource Management Area Committees through the Village Resource Guards shall be responsible for enforcing these regulations.
d. The following regulations shall apply in the hunting areas:
e. All animals and birds shall be hunted with a valid licence issued by the Zambia Wildlife Authority to the Village Resource Management Area Committees.
f. Hunting shall be done between 1st September and 31stDecember.
g. No hunting shall be allowed in reserved areas.

h. Snares shall not be allowed in Chiulukire Forest.
i. Hunting shall be done using licenced guns.
j. Hunting using spears shall not be allowed in Chiulukire local forest.
k. Fire shall not be used for hunting nor for chasing animals.
l. Dogs shall not be used for hunting.
m. Hunting of young animals, pregnant animals and females with young ones is prohibited.
n. No photography shall be allowed without permit.

o. Traps shall not be used for hunting animals and birds.
p. No poison, bird-lime or poisoned weapons shall be used in hunting.
q. Hunting during hours of darkness using a torch, flare, Bulala lamp, or any other artificial light is prohibited.
r. Capturing of animals, birds and snakes without a permit shall not be allowed.
s. Any person who violates any of the regulations shall be guilty of an offence and shall lose the right to hunt for at least one year.

4. ECOLOGICAL PRESCRIPTION

Chiulukire Local forest has a variety of animal and bird species especially in the northern part and around Chilima area. There are more than eighteen species of birds. The animals are mainly found close to streams where there is water and fodder. The habitat for animals and birds shall be protected. Early burning shall be carried out starting on 15th May, or as determined by the Forest Department and the VRMAC, every year. The table below shows the animal species that are found in Chiulukire.

LOCAL NAME	ENGLISH NAME	LOCAL NAME	ENGLISH NAME
Changa	Bush baby	Mbeba	Mouse
Chinungu, Nungu, Nunji	Porcupine	Mbila	Rock-rabbit
Fututu, Fundwe	African civet	Mkango	Lion
Gologolo		Mnkhwele	Monkey
Insa	Duiker	Nankhodwe	Waterback
Kafundo	Sharpes grysbok	Nchenzi	Cane rat
Kaingo/ nyalugwe	Leopard	Ngulube	Wild pig
Kalulu	Hare	Njati	Buffalo
Kambuku	Cheetah	Nsimba	Serval cat
Kamundi	Squirrel	Nswala	Impala
Kandende	Mongoose	Nyani	Baboon
Kapate, Pate	Bush squirrel	Pusi/ cheta	Vervet monkey
Mbalale	Mountain goat		

While the forest was once rich with wildlife (as recently as 15 years ago, according to some informants), today it is limited to mainly smaller animals. On rare occasions, larger cats or antelope wander inside.

5. FINANCIAL ASPECTS

The Village Resource Management Area Committees shall be responsible for collection, managing and sharing of revenue collected from any issued permits.

6. INDICATORS FOR MONITORING

The Village Resource Management Area Committee shall be responsible for monitoring the Wildlife activities through the Village Resource Guards. The licenced hunters shall report to the VRMACs any violations of the regulations.

The following monitoring indicators shall be used:

a. Number of animals and birds counted on pre-designated VRG routes
b. Trends in animal populations by species, documented by VRGs along wildlife routes
c. Revenue raised from sales of hunting licences (reported by VRMAC to JFM Steering Committee)
d. Number of people apprehended and charged or suspended for violating regulations
e. Quality and maintenance of reserved areas as measured by encroachment and livestock use
f. Number of snares and traps confiscated in the forest

SECTION V. ADMINISTRATIVE ASPECTS

THE FIVE VILLAGE RESOURCE MANAGEMENT AREAS (VRMAs)

THE FIVE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES (VRMACs)

FINANCIAL MANAGEMENT

IMPLEMENTATION OF THE MANAGEMENT PLAN

THE FIVE VILLAGE RESOURCE MANAGEMENT AREAS (VRMAS)

These are administrative management units consisting of groups of villages responsible for forest resources near them. Administrative management units are a way of managing large forest areas such as Chiulukire Local Forest.

Each Village Resource Management Area shall be independent in terms of Village Resource Guards, issuing of permits, and monitoring; but each shall work in collaboration with the others in implementing the joint forest management plan.

There are five Village Resource Management Areas in Chiulukire. These are Chinkhombe, Matunga, Magobo, Mkaika, and Zinaka (refer to forest maps). Each VRMA will have its own Village Resource Management Area Committee responsible for implementation of specific elements of the joint forest mangement plan.

THE FIVE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES (VRMACS)

1. COMPOSITION OF THE VRMAC

Each Village Resource Management Area Committee shall be comprised of no more than 15 members, as follows (SEE THE FOLLOWING ORGANIZATIONAL DIAGRAM):

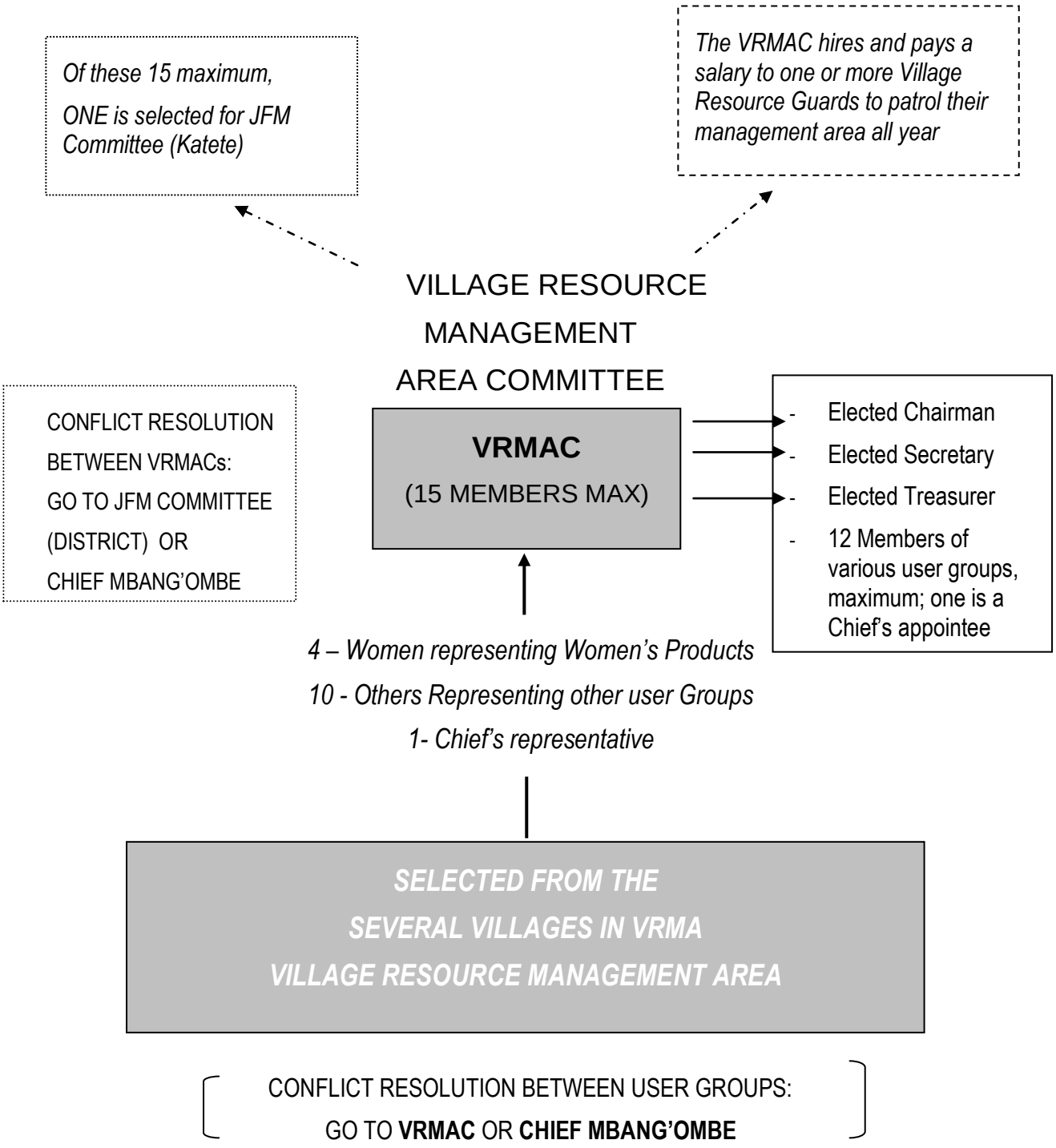
a. One Chief's representative who is appointed by the Chief
b. Four elected women representatives
c. No more than 10 (ten) elected members from the User groups (total number defined by the number of user groups available in the area)

2. GENERAL ROLES OF THE VRMAC

a. Acting as a link between the community, Joint Forest Management Committee in Katete, and the Forest Department
b. Formulating their own by-laws and code of conduct
c. Supervising the day to day operations during implementation of the joint forest management plan
d. Preparing and monitoring work programmes related to forest management activities
e. Planning and implementing community projects which shall contribute to the socio-economic development of the local community and sustainability of natural resources in the Joint Forest Management Area
f. Convening village meetings to report and review work progress
g. Submitting activity and financial reports to the Joint Forest Management Committee, to Forest Department, and to their communities (see Section VI and following paragraphs for frequency and types of reporting)
h. Recruiting Village Resource Guards and monitoring their performance
i. Resolving User Group disputes /conflicts
j. Issuing permits to community forest users and collecting revenue for certain permits
k. Performing other functions as the Joint Forest Management Committee may delegate.

JOINT FOREST MANAGEMENT ORGANISATION STRUCTURE AT LOCAL LEVEL

5 OF THESE:



3. ELECTION OF VRMAC MEMBERS

The election process shall proceed as follows in each of the 5 VRMAs:

a. Forest Department officers and CLUSA facilitators shall facilitate the elections.

b. The number of committee members to be elected is at most 14 (fourteen); see 2.1. above, Composition of the VRMAC.

c. The candidates shall be nominated by the local community. Aspirants should meet the following criteria to be eligible for nomination:
   - Resident of the area for at least three years
   - Able to read and write
   - Knowledgeable in forest resources
   - Honest and Hard working
   - No criminal record
   - Minimum age of 18 years

d. Voting shall be done by private or secret ballot.

e. The person with the highest number of votes after the count becomes the winner.

f. In the event of candidates having the same number of votes, a re-run of elections shall be done until an outright winner emerges.

g. The members of the VRMAC shall elect a Chairperson, a secretary, and a treasurer from amongst themselves.

h. One of the **elected** members of this VRMAC will be appointed to represent the VRMAC at quarterly Joint Forest Management Committee meetings in Katete.

i. The Chief's representative does have voting rights on the VRMAC. However, the Chief's representative does not hold office except as advisor and reporter.

j. In the event of a position falling vacant, either through death or resignation or any other cause, a by-election shall be held to fill the vacant position.

4. VRMAC TENURE OF OFFICE

a. The elected members of the VRMAC shall serve for a term of three years.

b. The members shall not serve for more than two terms of office.

c. The chief's representative shall not have a limited term of office; it depends on the chief's decision. If he is not performing his duties, he must be reported to the Chief in writing by the VRMAC and/or the JFM Committee.

5. VRMAC MEETINGS

5.1. FREQUENCY OF MEETINGS

a. *The VRMACs shall meet once every month. However, the Chairperson may convene an urgent meeting.*

5.2 QUORUM FOR THE MEETINGS

a. *More than half of the elected VRMAC members present shall form a quorum for holding a meeting. Among these, there must be at least the chair or the secretary present.*

5.3. CODE OF CONDUCT

a. Any committee member missing three consecutive VRMAC meetings shall be dismissed and a replacement will be found as in 3.j. above.

b. Corruption and favoritism in issuing permits or other business will not be entertained and will result in instant dismissal of the committee member.
c. Warnings shall be issued for the following offences:
    - Disorderly conduct such as drunkenness

d. A second offence will be grounds for dismissal from the VRMAC.

6. VRMAC REPORTING

6.1. FINANCIAL REPORT

The Treasurer of the VRMAC shall prepare a financial report each month. The report is to be tabled by the VRMAC and presented to the local community QUARTERLY and to the Joint Forest Management Committee MONTHLY.

This financial report shall include the following:

a. Amount of revenue collected from each product
b. Number of permits / licences issued,
c. Quantities of products / produce harvested
d. Total amount of revenue collected per quarter
e. Total expenditure per quarter
f. Type of expenditure

6.2 ACTIVITY REPORT

The secretary and the treasurer of the VRMAC shall prepare an activity report of forest management activities each month such as early burning, marking of trees, boundary maintenance. This report shall be presented to the rest of the VRMAC MONTHLY; and to the local community and the Joint Forest Management Committee QUARTERLY.

The activity report shall include the following:

a. Name / type of activity (Description of the activity)
b. Responsible people for implementing the activity
c. Date activity began
d. Date activity completed
e. Cost of the activity
f. Source of any funding received
g. Problems experienced
h. Possible solutions
i. Achievements and outputs

FINANCIAL MANAGEMENT

1. PERMITS FOR CHIULUKIRE FOREST PRODUCTS

Four types of permits shall be used in Chiulukire local Forest (see examples following):

(1) Chiulukire Local Forest Joint Management Area free permit or register

This permit is for noncommercial (domestic use only) mushrooms, caterpillars, fruits, firewood, medicine, thatch, barkrope. It takes the form of a list of registered users from Chiulukire villages within the VRMA who must renew subscription annually or as decided by the VRMAC.

Qualifications for being placed on the register of harvesters on a free permit are the following:

1. ***Resident of a participating Chiulukire village, and***
2. ***Having learned, understood, and demonstrated, and being willing to undertake, the legal and ecological responsibilities of the user group pertaining to that forest product.***

(2) **Chiulukire Local Forest "Joint Forest Management Area Permit"**

Revenues collected from sale of this permit shall be shared according to agreed proportions (see 4. REVENUE SHARING below). This permit shall be issued in quadruplicate for timber, poles, firewood, wood for carvings and manufacturing of charcoal. The first copy shall be given to the customer, second copy will go to the District Forest Officer, the third copy to the Joint Forest Management Committee. The last copy shall remain in the VRMAC receipt book for auditing purposes.

Note that only casual licences shall be issued for sawing timber and not standard commercial pitsawing licences due to low stocking of timber and to the size of the forest.

(3) Village Resource Management Area "100% Retention Permit"

All revenue collected (100%) from the sale of these permits shall be retained by the Village Resource Management Area Committee.

This permit shall be issued in duplicate for bamboos, grazing, sunde (brooms) and cultivation in the forest (fields). The original copy shall be given to the customer while the duplicate shall be retained in the permit book for auditing purposes.

(4) Forest Department conveyance licence

This type of licence shall be issued by the District Forest Officer when the customer wants to transport timber, charcoal and firewood from Chiulukire local forest to any other place outside the Village Resource Management Areas. It is particular to the Forest Department and is not shared at the village level.

CHIULUKIRE LOCAL FOREST JOINT FOREST MANAGEMENT VRMA PERMIT

for charcoal, timber, and firewood

Serial No……..

Date:……..

VRMA:……..

Licencee……..NRC…… …… Village……. Chief……

District ……..

TYPE OF PRODUCE	QUANTITY	UNIT PRICE	OPERATION AREA	AMOUNT (Kwacha)
			GROSS REVENUES	

Percent of revenue to be shared between:

GOVERNMENT _____ %

LOCAL COMMUNITY _____ %

TOTAL FROM ABOVE TO GO TO GOVERNMENT: ZK _____

Expiry Date:……..……

Date Stamp

Issued By:…… Signature:……..……..

Footnote: This licence is not transferable.

CHIULUKIRE LOCAL FOREST
JOINT FOREST MANAGEMENT AREA

Serial No:……..

VILLAGE RESOURCE MANAGEMENT AREA PERMIT
OR FINE COLLECTION

This permit shall be used on forest produce whose 100% revenue shall be retained by the local community:

Grazing fees, brooms (sunde), bamboos, and fines for illegal fields and other infractions noted by Village Resource Guards or other citizens in the VRMA

Date:……..

VRMA:……..……

Name:…… NRC:…… Village:…….

PARTICULARS OF PRODUCE

TYPE OF PRODUCE	QUANTITY	UNIT PRICE	OPERATION AREA	AMOUNT (Kwacha)
		TOTAL TO BE BANKED:		

Expiry Date:……. ***Date Stamp***

Issued By:……..
Signature:……

Footnote: This permit is not transferable.

CHIULUKIRE LOCAL FOREST
JOINT FOREST MANAGEMENT AREA

SUMMARY CASHBOOK ***Serial no……***

QUARTER (circle one) 1 2 3 4

Village Resource Management Area: ……..….

DATE	**LICENCE NO.**	*ACCOUNT NO.*	*AMOUNT*
		Total:	

Treasurer: ……..…… Signature:……...

VRMA Stamp:

Amount collected…….(K……..……)

Collected by ……..…… Signature……..……..……

Date Stamp:

CHIULUKIRE LOCAL FOREST JOINT FOREST MANAGEMENT AREA
REGISTER FOR ACCOUNTS BOOKS

NAME OF ACCOUNTS BOOK	SERIAL NO.	DATE ISSUED	ISSUED BY		RECEIVED BY		VRMA	REMARKS
			NAME	SIGNATURE	NAME	SIGNATURE		

2. STORAGE AND DISTRIBUTION OF FOREST PRODUCT PERMITS

a. The revenue-producing permits will originate at the office of the Provincial Forestrry Office in Chipata. The Katete District Forest Officer shall take delivery of the permits and keep them in the safe.

b. Permits will be issued to the Village Resource Management Area Committees on request and in quantities that match the annual allowable harvest of each product.

c. The District Officer shall also maintain a register of all Accounting Documents for Chiulukire Joint Forest Management Area.

d. The treasurer for each Village Resource Management Area shall be responsible for receiving and signing for permits from the Forest Officer. The District Forest Officer shall ensure that the person receiving signs for the Accounting books.

e. Permits will be coded and registered by VRMA and serial number. It is therefore prohibited to exchange books between VRMAs.

3. REVENUE COLLECTION, TRANSMITTAL, AND BANKING

a. The Village Resource Management Area Committees through their treasurers shall be responsible for revenue collection for permits sold to members of user groups.

b. The VRMACs are responsible for opening their own account(s) for the purpose of depositing revenues collected from sale of 100-percent-retention permits (the so-called VRMA 100% Retention Permits). The VRMAC treasurer shall be responsible for the maintenance of this account for the VRMA. An internal VRMAC team and the JFM Committee are responsible for auditing this account (see below).

c. The procedure for banking of revenue for shared-revenue permits (the Chiulukire Local Forest Joint Management Permits) will be as follows:

   (1) The Joint Forest Management Committee shall maintain a bank account in which the permit revenues transmitted from the five Village Resource Management Areas shall be deposited.

   (2) The District Forest Officer shall receive the revenue from all the Village Resource Management Areas at least once every month and give the money to the Treasurer of the Joint Forest Management Committee for banking in the Joint Forest Management account.

   (3) A Summary cash book shall be maintained by the treasurer of the JFMC in which the total revenue received from the VRMACs shall be entered in triplicate. The summary cash book shall be used when banking the money.

4. REVENUE SHARING

4.1. PERCENTAGES AND USES OF REVENUES

a. The revenue collected from permits / licences issued, concessions granted and services rendered shall be distributed by the Joint Forest Management Committee on a quarterly basis in the following proportions:

- Forest Department Headquarters 15%
- Provincial Forest Office 20%
- Joint Forest Management Committee 5%
- District Forest Office 20%

- Village Resource Management Area Committee on behalf of the Local community 30%
- Chief Mbang'ombe 10%, SUBJECT TO REVIEW AFTER ONE YEAR.

b. The revenues shall not be used for sitting allowances, per diems, nor salaries on the part of Village Resource Management Committee, Joint Forest Management Committee, District Forestry Officer, nor any other entity participating in this management plan. They may be used to pay for travel costs, stationery, and accommodation where necessary.

c. The Joint Forest Management Committee shall use their portion of revenue to cover their operating costs with respect to Joint Forest Management: stationery, occasional field trips to Chiulukire.

d. The District Forest Office will use its share to facilitate training Village Resource Management Area Committees, user groups and Village Resource Guards, including necessary fuel and training materials.

e. The Local community through the Village Resource Management Area Committees shall use funds to pay the Village Resource Guards, maintain the forest boundaries, and promote forest-based businesses.

f. The VRMAC or community members may also propose activities benefiting the community that may utilise shared revenues. The proposed project or activity shall be presented and tabled at the Joint Forest Management Committee meeting for approval.

4.2. GRANTS AND DONATIONS

a. The Joint Forest Management Committee shall accept grants and donations from any source within or outside the country on behalf of the local communities of Chiulukire local forest.

5. FINANCIAL RECORDKEEPING

5.1. BOOKS AND REPORTS

a. The Treasurers of the Joint Forest Management Committee and the Village Resource Management Area Committee shall be responsible for financial recordkeeping.

b. Receipt books, cash books, cheque books, statements of income and expenditure, and balance sheets shall be maintained by the Treasurer of the JFMC.

c. These accounting documents shall be open for inspection to Forest Department, the Joint Forest Management Committee, and the Village Resource Management Area Committees.

d. The Joint Forest Management Committee shall, not later than one hundred and eighty days after the end of the financial year, submit to Forest Department and the Local community the following:

- an audited balance sheet
- an audited statement of income and expenditure
- an activity report for the year under review

5.2. CHEQUES

a. There shall be three signatories to the Joint Forest Management Committee and Village Resource Management Area bank accounts. These shall be the Chairman, and either the treasurer of JFMC or the Chief's representative.

6. AUDITING

a. Each Village Resource Management Area Committee shall appoint an Internal Audit Committee among them. The VRMAC Audit Committee shall audit the books once every after three months.

b. In addition, auditors appointed by the Joint Forest Management Committee shall audit the Village Resource Management Area Committees every three months.

c. Auditors appointed by Forest Department shall audit the Joint Forest Management Committee every three months.

d. The Auditors shall prepare audit reports. Audit reports shall be presented to Forest Department, Joint Forest Management Committee, VRMACs, and the local communities quarterly and annually.

7. MISAPPROPRIATION OF FUNDS

Any person who misuses funds shall be prosecuted in a court of law.

IMPLEMENTATION OF THE MANAGEMENT PLAN

1. ROLE OF TRADITIONAL AUTHORITIES

The Traditional rulers shall be involved in the administration and management of Chiulukire local forest and in conflict resolution. They shall be responsible for:

a. *setting aside land for resettling people,*
b. *advising the Village Resource Management Area Committees, Joint Forest Management Committee and Government on policy formulation and implementation*
c. *mobilizing the local community to participate in sustainable forest management and utilization.*
d. *Arbitration*
e. *Endorsement of the Joint Forest Management Plan*

2. ROLE OF THE FOREST DEPARTMENT

Forest Department shall facilitate the implementation of the Forest Management Plan for Chiulukire local forest.

At the district level:

- *build local capacity among the community*
- *play a role in revenue management from VRMACs*
- *coordinate activities*
- *enforce rules and regulations*
- *provide technical advice and necessary incentives for effective implementation of the Management Plan and*
- *train Village Resouce Guards and monitor their performance*

At the provincial level:

- *coordinate activities*
- *distribute revenue-producing permits*
- *provide technical advice as needed*

At the National level:

- *endorse the plan*
- *ensure gazetting of the management plan*
- *provide technical advice as needed*

3. ROLE OF THE JOINT FOREST MANAGEMENT COMMITTEE

The Joint Forest Management Committee shall be responsible for developing the Joint Forest Management Area and distributing the benefits amongst the local community. The specific functions shall include the following:

a. *Assist in developing management plans and facilitate implementation*
b. *Negotiating, in conjunction with Forest Department, Co-management Agreements with other stake holders*
c. *Monitoring the implementation of the management plan*
d. *Ensuring that the Management Plan is carried out in accordance with Forest regulations*
e. *Ensuring that the benefits derived from the forest are shared accordingly*
f. *Ensuring that books of accounts and other records are kept properly*
g. *Holding meetings regularly to review progress on the implementation of activities*
h. *Submitting progress reports to Forest Department on quarterly basis*
i. *Performing such functions as the Forest Department or the Director of Forests may delegate to it.*
j. *Developing their own work plans and budgets*
k. *Conflict resolution (that flows over from VRMAC or between stakeholders)*

4. ROLE OF THE VILLAGE RESOURCE MANAGEMENT AREA COMMITTEES

T*he Village Resource Management Area Committees shall be responsible for implementation of the Management Plan. They shall also be responsible for recruiting Village Resource Guards, financial management, reporting, facilitating development of Forest Based Enterprises and monitoring of activities, and other duties as listed in VRMAC chapter sunsection 2 above.*

The roles of the of the three office bearers can be summarized as follows:

a. *Role of the Chairperson*
    - *Preparing the agenda for meetings in collaboration with the Secretary*
    - *Calling meetings*
    - *Chairing meetings*
    - *Ensuring that management activities are monitored and reported*
    - *Solving problems and resolving conflicts*

b. *Role of the Secretary*
    - *Preparing minutes for the meeting*
    - *Reading minutes from the previous meeting*
    - *Maintaining records, reports and important documents like by-laws*
    - *Assisting the Chairperson to prepare agenda*
    - *Assisting Chairperson to send notices for meetings*
    - *Preparing reports*

c. *Role of the Treasurer*

- *Collecting revenue for permits sold*
- *Issuing permits*
- *Keeping all financial records*
- *Preparing monthly financial reports*
- *Maintaining the Village Resource Management Area Committee Bank account, where applicable.*

5. ROLE OF THE VILLAGE RESOURCE GUARDS

a. *The Village Resource Guards (VRGs) shall be employees of the Village Resource Management Area Committees (VRMACs). They shall be responsible for*

- *marking trees*
- *demarcating coupes*
- *providing extension information on forestry issues*
- *patrols*
- *organising early burning*
- *measuring and verifying fuelwood cords in the forest*
- *checking for extensions of fields and for new fields*
- *making a register of field areas and owners every September*
- *mobilizing people to extinguish late fires*

b. *Village Resource Guards shall have powers to apprehend any forest offender within the context of this management plan. The relevent acts are in the Wildlife Act _____, Fisheries Act _____, Agricultural Act _____ , and Forest Act CAP 199 of 1999 Section 8(4). These shall be used in conjunction with the relevent officers in apprehending offenders.*

c. *A minimum of one Village Resource Guard per Village Resource Management Area shall be employed and paid a monthly salary by the VRMAC.*

d. *The VRMAC shall assist voluntarily in the duties of the VRGs.*

5.1 QUALIFICATIONS OF THE VILLAGE RESOURCE GUARDS

The Village Resource Guards who shall be male or female shall have the following qualifications:

a. Local resident of the Village Resource Management Area
b. Physically fit
c. Knowledgeable in forest resources
d. Honest
e. Hard working
f. Able to read and write
g. Minimum age of 18 years

6. ROLE OF CLUSA AND OTHER NGOs

a. Facilitating implementation of the Forest Management Plan

b. Monitoring harvest and implementation activities

c. Assisting in enterprise development

d. Assisting user groups to access credit from Credit Management Services and other Financial Institutions.

e. Providing technical assistance and training during the life of the project.

7. ROLE OF USER GROUPS

a. The user groups shall carry out their activities in line with forest regulations.

b. User groups are not required to form cooperatives. However, they must write their own by-laws that govern sustainable use and harvest of their products.

c. The user groups are primarily responsible for the interests of their members.

d. The user groups are not formed for the purpose of rendering service to the Village Resource Management Committee, nor to any member of the Forest Department, nor to the Joint Forest Management Committee, nor to the Chief, nor to the Chief's representatives.

e. The user groups shall assist in early burning and controlling fires.

f. The user groups are required to assist in boundary demarcation in conjunction with the Forest Department at the outset of the management plan (see chapter on Boundaries in Section IV).

g. User groups must work in collaboration with each other in order to reduce tension and conflicts that may arise.

SECTION VI. EVALUATION AND MONITORING

MONTHLY, QUARTERLY, AND YEARLY ACTIVITIES

YEAR-BY-YEAR WORK AND MONITORING ACTIVITES

MONTHLY, QUARTERLY, AND YEARLY ACTIVITIES

1. MONTHLY REQUIREMENTS

1.1. VRMAC monthly meeting

a. The elected secretary recounts what boundary, fire, or other management activities have taken place in the month to the rest of the VRMAC.

b. The treasurer reports on amount of revenue collected for permits.

c. The Village Resource Guard (VRG) reports on any infractions encountered, including at least the following:

- ➔ Trespassing/hunting inside reserved areas
- ➔ Late fires and accidental fires
- ➔ Wildlife hunting during first three years; snares, traps confiscated; hunters hunting without permit
- ➔ Fishing by prohibited methods
- ➔ Cultivation on streambanks
- ➔ New field encroachmentst
- ➔ Expanded fields
- ➔ Prohibited tree felling practices (see cutting chapter)
- ➔ Honey hunting
- ➔ Sunde (broom) plant wasting and not clearing around live stems
- ➔ Harvest of more forest produce than allowed on permits obtained from VRMAC (including incorrect and excessive number of cords of wood)
- ➔ Fruit wasting
- ➔ Pigs, goats, sheep, unpermitted cattle impounded in forest

1.2. VRMAC financial reports to JFMC and villages

a. Reports summarize number of permits sold by product.

b. The amount of revenue collected for the permits to be banked by the JFMC Treasurer is recorded.

c. The VRMAC recounts the amount and destination of revenues to their villages for their information.

1.3. Revenue collection by District Forestry Officer (DFO)

a. The DFO at least monthy visits the VRMA treasurers to receive permit revenues for banking in Katete.

b. The permit revenues are transferred from the DFO to the JFMC treasurer for banking.

2. QUARTERLY REQUIREMENTS

2.1. VRMAC activity report to JFMC and to villages

Activities related to management of Chiulukire Forest are reported. These include boundary, fire, and other work concerning all the user groups in general, in addition to these elements required by JFMC in their "progress reports" to the Forest Department:

- Advancement of resettlement of villages inside forest
- Boundary maintenance
- Infractions reported by the Village Resource Guard as above
- Any shortages of forest products reported by user groups

2.2. JFMC financial reports to VRMAC and Forest Department

a. The permit revenues that were banked by the JFMC treasurer are reported to the VRMAC.

b. The distribution of permit revenues is made, documented, and reported by JFMC to the VRMAC and to the Forest Department.

2.3. JFMC progress reports to Forest Department

Progress reports are made based on reports from VRMAC and cover the following (some activities are seasonal only and will be recorded once per year):

- Advancement of resettlement of villages inside forest
- Boundary maintenance
- Summary of products sold from the forest during the quarter (for monitoring of maximum allowable harvests)
- Infractions reported by the Village Resource Guard as above
- Specific problems encountered and solutions
- Conflicts resolved by Chief, JFMC, VRMAC

2.4. JFMC quarterly meetings

These meetings can be used to compose progress and financial reports and to resolve conflicts specific to Chiulukire Local Forest. The treasurer and secretary of the JFMC need to arrange the times when they will reconcile banking and report-writing activities.

2.5. Audit reports

a. Forest Department-appointed auditors report on JFMC books.

b. JFMC-appointed auditors report on VRMAC books.

c. Internal auditors of the VRMAC audit VRMAC treasurer work.

3. YEARLY REQUIREMENTS

3.1. VRMAC progress reports to JFMC

This report should highlight the year's accomplishments, products and permits sold, and the following:

- Progress report on relocation of forest squatters and gardens
- Current list of those with fields inside the forest
- Rents collected on fields inside the forest
- Assessements of fish pond, fodder bank, bamboo reserve, live fencing, charcoal coupe, and grazing area establishment
- Assessment of success of early burning, wildlife regeneration, live fence introduction, streambank protection, and revenue sharing programs
- Current registers of those with local free permit rights
- Current list of registered local user group members (for monitoring level of resource use)
- Current year's boundary work
- Summary of year's "problems" and their resolution

3.2. JFMC activity report to Forest Department

This report should summarize VRMAC reports on

- program successes, problems and solutions
- products sold through the year by species and size where applicable
- conflicts resolved through the year
- progress on relocation of forest settlements
- issues relevent to the chief

3.3. JFMC financial report to Forest Department and VRMACs

This report should summarize

- the year's income for the five VRMACs
- the revenue shared between all the stakeholders
- the sources of the revenues
- the utilisation of any revenues for JFMC expenses as permitted in Section V

3.4. Forest Department financial report on conveyance fees collected from Chiulukire Forest products

3.5. All concerned stakeholders meet annually to evaluate appropriateness of current allowable harvests

This annual meeting is to evaluate the appropriateness of the harvest levels of, and policies governing, the several commercially important forest products leaving Chiulukire Forest or requiring tree cutting, especially:

- Sawtimber trees
- Carving trees
- Charcoal
- Fuelwood
- Barkhive trees
- Bamboo
- Brooms (sunde)

b. Factors that may change the allowable harvest include:
   - Number of infractions noted for each product whether for permit condition violations or lack of permits
   - A shortage of regeneration noted for the species being harvested
   - Proof of strong success or failure of the regeneration plans for the product

c. Factors that may NOT change the allowable harvest include:
   - Addition of people from outside the forest area to lists of registered users
   - Pressure from other VRMACs, from non-local residents, or from government employees to receive favors

3.6. User groups report annually to VRMAC on shortages of their products

The user groups take responsibility for monitoring the future availability of their products/species in the forest. They must report perceived shortages, overuse, abuse, and decline of their product to the Village Resource Guard or the VRMAC during their season of harvest. Harvest policy may then be modified by the VRMAC if necessary, on condition of approval of the JFMC.

YEAR-BY-YEAR WORK AND MONITORING ACTIVITIES

YEAR 1	▪ Work on map for resettlement ▪ Make a list of resettlement target families ▪ Engage Kasamanda in management program ▪ Weekly visits by Village Resource Guard to new wildlife reserves; information campaigns on the reserves ▪ Contact National Heritage for Rock Paintings ▪ Identify sawyer and other user group members; make a register of users for each product (some permits free) ▪ Establishment of coupe for charcoal; training ▪ Identify markets for main products ▪ Regeneration plot or other system development ▪ Broom depot establishment ▪ Training and writing of bylaws for VRMACs ▪ 3-year hunting ban starts
YEAR 2	▪ Promotion of live fence, bamboo, and forage planting outside forest ▪ Documentation of size and species of barkrope trees ▪ Wildlife population monitoring scheme developed; bimonthly visits to reserved areas by VRGs ▪ National Heritage site gazetted ▪ All villages sensitized and trained for early burning ▪ Regeneration plot or other assessment method tried ▪ Check registers of user groups for consistency ▪ Assessment of trial charcoal coupe and establishment of new one based on evaluation ▪ Broom depot functional ▪ Promotion of fodder banks, live fences, and fish ponds ▪ 3-year hunting ban: second year ▪ User group bylaws written
YEAR 3	▪ Estimate use of alternative fibers and forage in villages ▪ Possible reduction in VRG visits to reserved areas ▪ Boundary demarcation completed in 5 VRMAs ▪ Proposal of acceptable regeneration scheme for moratorium sawtimber trees ▪ Introduction of acceptable regeneration scheme for mopane ▪ Assessment of regeneration from coppices of coupes ▪ Review and adjustment of cutting policies if needed ▪ Review of commercial aspects of caterpillars, barkrope, fruit
YEAR 4	▪ Continued assessment of regeneration of trees and animals; adjustments to cutting/hunting policies where necessary
YEARS 5 TO 10	▪ Annual evaluations of management plan elements and success

.

LIST OF TREES FOUND IN INVENTORY AND VRA

1. *SCIENTIFIC* -- LOCAL NAMES

SCIENTIFIC NAME	LOCAL NAME
ACACIA ERIOLOBA	NYAFUNGO, MKUNKU
ACACIA GERRARDII	KAFIFI, MZUNGANYEWE
ACACIA NIGRESCENS	NYAMAPONOMBWE
ACACIA SIEBERANA	MZIZI, MTUBETUBE
ADANSONIA DIGITATA	BAOBOB, MLOMBWA
AFZELIA QUANZENSIS	MPAPA, MGALILONDO
ALBIZIA HARVEYI	MPALANKANGA
ALLOPHYLUS AFRICANUS	KAFUPAKACHIMBWI
ANNONA SENEGALENSIS	MPOVYA
BAUHINIA PETERSIANA	MPONDO, KATONDOTONDO
BRACHYSTEGIA ALLENII	MSUMBU, MFENDALUZI, MVUKWE
BRACHYSTEGIA BOEHMI	MFENDALUZI, MKOMANYANDA
BRACHYSTEGIA BUSSEI	MKONGOLO, MSALE
BRACHYSTEGIA LONGIFOLIA	BOVU, MFUNDANZIZI
BRACHYSTEGIA MANGA	MSUMBU, MTUWA, MFENDALUZI
BRACHYSTEGIA SPICIFORMIS	MPUTI
BRACHYSTEGIA STIPULATA	MNYANDA
BRACHYSTEGIA UTILIS	MKUTI, KASUMBUTI, KAVWENJE
BRIDELIA CATHARTICA	MKUZYANDOLA, MSEKAMANO
BRIDELIA DUVIGNEAUDI	MWANJANE
BURKEA AFRICANA	KAWIZI, MKOSO
CANTHIUM CRASSUM	MAPOLOYAKALULU
CASSIA ABBREVIATA	MLEZA, MKOSWE
CASSIA SINGUEANA	KALUSAPWE
CASSIPOUREA MOLLIS	MPINDULE
COLOPHOSPERMUM MOPANE	LUPANYA, MUPANI, MPANE, CHANYE
COMBRETUM COLLINUM	MKUTE, KALAMA
COMBRETUM MOLLE	KALAMA,
COMBRETUM ZEYHERI	KALAMAFUPA, KANDALE
COMMIPHORA AFRICANA	CHOLOLO, CHITONTO
COMMIPHORA MOLLIS	CHITONTO,
CROSSOPTERYX FEBRIFUGA	MWAVI, KAPULUKOSO
CUSSONIA ARBOREA	MBWABWA, MPANDANJOVU
DALBERGIA MELANOXYLON	PINGO, KASALUSALU
DALBERGIA NITUDULA	MKOLANSINGA
DALBERGIELLA NYASAE	MKANGANJOVU, KAFUNDAKWEO
DICHROSTACHYS CINEREA	KALUMPANGALA, KATENGE
DIOSPYROS KIRKII	MCHENJANKULO
DIOSPYROS MESPILIFORMIS	MCHENJA, MCHENJASUMU
DIPLORHYNCHUS CONDYLOCARPON	MTOWA, MTOMBOZI
EKEBERGIA BENGUELENSIS	MZILU, MVILU
EUPHORBIA INGENS	MLANGALI
FICUS CAPENSIS	MKUYU,
FLACOURTIA INDICA	NTHUDZA, MAKOKOLONO
GARDENIA SPP	MTALA
GREWIA SPP	MSIPANI
HEXALOBUS MONOPETALUS	MKANDANCHEMBELE, MKAMBENDULA
JASMINUM FLUMINENSE	KAMEMENA, MSALANKUNZI
JULBERNADIA GLOBIFLORA	KAMPONI
JULBERNARDIA PANICULATA	MTONDO
KHAYA NYASICA	MUBABA
KIGELIA AFRICANA	MVUNGULA, MVUNGUTI
KIRKIA ACUMINATA	MZUMBA, MTUMBWI
LANNEA DISCOLOR	CHAUMBU
LANNEA STUHLMANNI	CHAUMBU
LONCHOCARPUS CAPASSSA	CHIMPAKASA, MSWASWA
MONOTES AFRICANUS	MKALAKATE, MZAZA
OLDFIELDIA DACTYLOPHYLLA	KAFUMBAFUMBA
ORMOCARPUM BIBRACTEATUM	PULUPULU, NKAMA
OXYTENANTHERA ABYSSINICA	NTELE, NSUNGWI
PAVETTA CRASSIPES	MATUANGOMA
PENTARRHINUM INSIPIDUM	KAKOLOWOZI
PERICOPSIS ANGOLENSIS	MWANGA

SCIENTIFIC NAME	LOCAL NAME	*SCIENTIFIC NAME*	LOCAL NAME
PILIOSTIGMA THONNINGII	MSEKESE	*TURRAEA NILOTICA*	MTUNDA
PHYLLOCOSMUS LEMAIREANUS	MDIMA, KAPULULA	*UAPACA KIRKII*	MSUKU
POPOWIA OBOVATA	MCHINKA	*UAPACA NITIDULA*	KASOKOLOWE
PSEUDOLACHYNOSTYLIS MAPROUNEIFOLIA	MSOLO	*VANGUERIOPSIS LANCIFLORA*	MBYULU, MANGOLOVYA
PTEROCARPUS ANGOLENSIS	MLOMBE	*VELLOZIA EQUISETOIDES*	SUNDE
PTEROCARPUS CHRYSOFRIX	NKULA,SINELE	*XEROMHIS OBOVATA*	CHIPEMBELE
PTEROCARPUS ROTUNDIFOLIUS	MBANGOZI	*XIMENIA AMERICANA*	NTENGELE
SCHREBERA TRICHOCLADA	KAMBELEMBENDA, MPUMBAFUMBA	*ZANHA AFRICANA*	CHANGALUCHE, CHIBUKUZELA
SECURIDACA LONGEPEDUNCULATA	MPULUKA, MWINDA	*ZIZIPHUS ABYSSINICA*	KANKANDE
STEGANOTAENIA ARALIACEA	BIYO, FYOPOLA		
STERCULIA AFRICANA	MLELE, MGOZA		
STERCULIA QUINQUELOBA	MLELEZOMBO		

2. LOCAL - *SCIENTIFIC* NAMES

LOCAL NAME	***SCIENTIFIC NAME***	**LOCAL NAME**	***SCIENTIFIC NAME***
BIYO, FYOPOLA	*STEGANOTAENIA ARALIACEA*	KALAMAFUPA, KANDALE	*COMBRETUM ZEYHERI*
BOVU, MFUNDANZIZI	*BRACHYSTEGIA LONGIFOLIA*	KALUMPANGALA, KATENGE	*DICHROSTACHYS CINEREA*
BWELEZE, MZAZO		KALUSAPWE, MTANTANYELELE	*CASSIA SINGUEANA*
CHANGALUCHE, CHIBUKUZELA	*ZANHA AFRICANA*	KAMBELEMBENDA, MPUMBAFUMBA	*SCHREBERA TRICHOCLADA*
CHAUMBU	*LANNEA DISCOLOR*	KAMEMENA, MSALANKUNZI	*JASMINUM FLUMINENSE*
CHAUMBU, MSAMBANDOLA	*LANNEA STUHLMANNI*	KAMPONI	*JULBERNADIA GLOBIFLORA*
CHIMPAKASA, MSWASWA	*LONCHOCARPUS CAPASSA*	KANGANDELEKA	
CHIPEMBELE	*XEROMHIS OBOVATA*	KASOKOLOWE	*UAPACA NITIDULA*
CHITONTO,	*COMMIPHORA MOLLIS*	KANKANDE	*ZIZIPHUS ABYSSINICA*
CHOLOLO, CHITONTO	*COMMIPHORA AFRICANA*	KAWIZI, MKOSO	*BURKEA AFRICANA*
GONONDO	*TERMINALIA MOLLIS*	LUPANYA, MUPANI	*COLOPHOSPERMUM MOPANE*
GONONDO	*TERMINALIA SERICEA*	MAPOLOYAKALULU	*CANTHIUM CRASSUM*
GONONDO	*TERMINALIA STENOSTACHYA*	MATUANGOMA, MLYANSEFU	*PAVETTA CRASSIPES*
KABULUKULU, KAMBELI, MTULUTULU	*STRYCHNOS INNOCUA*	MBANGOZI	*PTEROCARPUS ROTUNDIFOLIUS*
KAFIFI, MZUNGANYEWE	*ACACIA GERRARDII*	MBWABWA, MPANDANJOVU	*CUSSONIA ARBOREA*
KAFUMBAFUMBA	*OLDFIELDIA DACTYLOPHYLLA*	MBYULU, MANGOLOVYA	*VANGUERIOPSIS LANCIFLORA*
KAFUPAKACHIMBWI	*ALLOPHYLUS AFRICANUS*	MCHELEKETE	*SWARTZIA MADAGASCARIENSIS*
KAKOLOWOZI	*PENTARRHINUM INSIPIDUM*	MCHENJA, MCHENJASUMU	*DIOSPYROS MESPILIFORMIS*
KALAMA,	*COMBRETUM MOLLE*	MCHENJANKULO, MCHENJA	*DIOSPYROS KIRKII*

LOCAL NAME	SCIENTIFIC NAME
MCHINKA	*POPOWIA OBOVATA*
MDIMA, KAPULULA	*PHYLLOCOSMUS LEMAIREANUS*
MFENDALUZI, MKOMANYANDA, MSAMBA	*BRACHYSTEGIA BOEHMI*
MKALAKATE, MZAZA	*MONOTES AFRICANUS*
MKANDANCHEMBELE, MKAMBENDULA	*HEXALOBUS MONOPETALUS*
MKANGANJOVU, KAFUNDAKWEO	*DALBERGIELLA NYASAE*
MKOLANSINGA, KABULASESE	*DALBERGIA NITUDULA*
MKONGOLO, MSALE	*BRACHYSTEGIA BUSSEI*
MKUTE, KALAMA	*COMBRETUM COLLINUM*
MKUTI, KASUMBUTI, KAVWENJE	*BRACHYSTEGIA UTILIS*
MKUYU,	*FICUS CAPENSIS*
MKUZYANDOLA, MSEKAMANO	*BRIDELIA CATHARTICA*
MLAKANJOVU,MSUNGAWA NTU, KAVUNGUTI	*STEREOSPERMUM KUNTHIANUM*
MLANGALI	*EUPHORBIA INGENS*
MLELE, MGOZA	*STERCULIA AFRICANA*
MLELEZOMBO	*STERCULIA QUINQUELOBA*
MLEZA, MKOSWE	*CASSIA ABBREVIATA*
MLOMBWA	*ADINSONIA DIGITATA*
MLOMBE	*PTEROCARPUS ANGOLENSIS*
MNYANDA	*BRACHYSTEGIA STIPULATA*
MPALANKANGA	*ALBIZIA HARVEYI*
MPAPA, MGALILONDO	*AFZELIA QUANZENSIS*
MPINDULE, KAMEMENAMBUZI	*CASSIPOUREA MOLLIS*
MPONDO, KATONDOTONDO	*BAUHINIA PETERSIANA*
MPOVYA	*ANNONA SENEGALENSIS*
MPULUKA, MWINDA	*SECURIDACA LONGEPEDUNCULATA*
MPUTI	*BRACHYSTEGIA SPICIFORMIS*
MSEKESE	*PILIOSTIGMA THONNINGII*
MSIPANI	*GREWIA SPP*
MSOLO	*PSEUDOLACHYNOSTYLIS MAPROUNEIFOLIA*
MSUMBU, MFENDALUZI, MVUKWE	*BRACHYSTEGIA ALLENII*
MSUMBU, MTUWA, MFENDALUZI	*BRACHYSTEGIA MANGA*
MTALA	*GARDENIA SPP*
MTOWA, MTOMBOZI	*DIPLORHYNCHUS CONDYLOCARPON*
MTUNDA	*TURRAEA NILOTICA*
MTONDO	*JULBERNARDIA PANICULATA*
MUBABA	*KHAYA NYASICA*
MVUNGULA, MVUNGUTI	*KIGELIA AFRICANA*
MWANGA	*PERICOPSIS ANGOLENSIS*
MWANJANE	*BRIDELIA DUVIGNEAUDI*
MWAVI, KAPULUKOSO	*CROSSOPTERYX FEBRIFUGA*
MZILU, MVILU	*EKEBERGIA BENGUELENSIS*
MZIMBILI, NTEMYA	*STRYCHNOS SPINOSA*
MZIZI, MTUBETUBE	*ACACIA SIEBERANA*
MZUMBA, MTUMBWI	*KIRKIA ACUMINATA*
NKULA,SINELE	*PTEROCARPUS CHRYSOFRIX*
NTELE, NSUNGWI	*OXYTENANTHERA ABYSSINICA*
NTEMYA, MTEME	*STRYCHNOS COCCULOIDES*
NTENGELE	*XIMENIA AMERICANA*
NTHUDZA, MAKOKOLONO, MKANDAMBAZO	*FLACOURTIA INDICA*
NYAFUNGO, MKUNKU	*ACACIA ERIOLOBA*
NYAMAPONOMBWE	*ACACIA NIGRESCENS*
PINGO, KASALUSALU	*DALBERGIA MELANOXYLON*
PULUPULU, NKAMA	*ORMOCARPUM BIBRACTEATUM*
SUNDE	*VELLOZIA EQUISETOIDES*

CHIULUKIRE BOUNDARY DESCRIPTIONS

NOTE: TEXT IN ITALICS INDICATES WORDING IN RE-TYPED VERSION OF THE ORIGINAL BOUNDARY DESCRIPTIONS; BOTH VERSIONS ARE FROM FOREST DEPARTMENT ARCHIVES.

Chiulukire West Boundary Description (*Chiulukire West Protected Forest Area No. 157.*

⇒ Starting at the point where the Zumwanda Native Reserve boundary crosses Road D.598 approximately 7.5 miles northwest of Tambala Village

⇒ *Starting at the northeast corner of Chiulukire East P.F.A. No. 158 on the Zumwanda Native Reserve boundary)*

- the boundary follows that of the Zumwanda Native Reserve in a southerly and then northeasterly direction to its intersection with the Kamulaza Stream
- thence down the Kamulaza Stream to its source
- thence in a straight line on a true bearing of 119.5° for 4,750 feet to Forest Beacon A
- thence in a straight line on a true bearing of 186.5° for 788 feet to a source of the Chavuza stream to its confluence with the Mukangasi stream
- thence down the Mukangasi Stream in a general northwesterly direction for approximately 1.7 miles to its confluence with an unnamed tributary
- thence up this tributary for approximately 0.8 miles to Forest Beacon B
- thence in a straight line on a true bearing of 269.5° for 10,032 feet to the source of an unnamed tributary of the Mponda Stream
- thence in a general western direction to its confluence with the Mponda Stream
- thence in a general northwesterly direction down the Mponda Stream for approximately 2.7 miles to a point where an unnamed tributary flows in from a north easterly direction
- thence in a northeasterly direction up this tributary to its northernmost source
- thence in a straight line on a true bearing of 56.5° for 1,076 feet to a confluence of an unnamed tributary of the Zinaka Stream and another unnamed tributary
- thence in a northeasterly and then southeasterly direction up this other unnamed tributary to its source
- thence in a straight line on a true bearing of 21.5° for 1,098 feet to the easternmost source of another tributary of the Zinaka stream
- thence down this tributary to its confluence with the Zinaka Stream
- thence in an easterly direction up the Zinaka Stream for approximately .02 mile to its confluence with an unnamed tributary flowing in from the north
- thence up this unnamed tributary in a general northerly direction to its northernmost source
- thence in a straight line on a true bearing of 7.5° for 550 feet to the source of an unnamed stream
- thence generally in a northerly direction and then westerly direction down this stream for approximately 1.7 miles to its confluence with an unnamed tributary
- thence in a straight line on a true bearing of 295.5° for a distance of approximately 0.4 mile to the source of an unnamed stream
- thence in a generally northwesterly direction for approximately 2.4 miles to its confluence with an unnamed stream
- thence in a generally easterly direction up this stream for approximately 1.4 miles to its confluence with an unnamed tributary flowing in from the northeast

- thence up this tributary in a general northeasterly direction for approximately 1.5 miles to its confluence with a smaller unnamed tributary flowing in from the east
- thence up this tributary for a distance of approximately 0.25 mile in an easterly direction to its source
- thence in a straight line on a true bearing of 26.5° for a distance of 1,080 feet to Forest Beacon C near the source of an unnamed stream
- thence down this stream to the point where it is intersected by the boundary of the Zumwanda Native Reserve
- thence along the aforesaid boundary in a southerly direction to the point where it crosses Road D598, approximately 7.5 miles northwest of Tambala Village, which is the point of starting.
    - *thence down this stream to the westerly boundary of Chiulukire East P.F.A. and southwards along this boundary to the point of starting.*
    - *Bearings and distances are approximate.*

The above described area is approximately **16,565 acres** in extent.

The above described area in extent 16,400 acres approximately is shown bordered green upon Plan No. FR. 224, deposited in the office of the Surveyor-General, signed by him and dated 14th February, 1964.

Chiulukire East Boundary Description *(Chiulukire East Protected Forest Area No. 158.)*

⇒ Starting at the point where the Zumwanda Native Reserve boundary crosses District Road D.598 approximately 7.5 miles northwest of Tambala Village

- the boundary follows the Reserve boundary northwards for 1.2 miles where it intersects a small unnamed stream
- thence down this small unnamed stream to its confluence with another unnamed stream
- thence down this unnamed stream to its confluence with the Mtetezi River
- thence up the Mtetezi River for approximately 2.5 miles to its confluence with an unnamed tributary
- thence up this tributary for approximately 0.9 miles to a fork
- thence up the most easterly of these forks in a general south-southeasterly direction for approximately 5 miles to Forest Beacon D
- thence in a straight line on a true bearing of 216.5° for 1,026 feet to the source of an unnamed small stream
- thence down this stream in a general west southwesterly direction to its confluence with the Kamulaza
- thence up the Kamulaza to its intersection with the Zumwanda Native Reserve Boundary
- thence along the aforesaid boundary in a south easterly
- thence northerly direction to the point where it crosses District Road D.598 approximately 7.5 miles northwest of Tambala Village, which is the point of starting.

Distances and bearings are approximate.

The above described area is approximately **13,450 acres** in extent.

*The above described area is in extent 13,350 **acres** approximately is shown bordered green upon Plan No. FR. 225, deposited in the office of the Surveyor-General, signed by him and dated 14th February, 1964.*

INVENTORY ANNEX

SAMPLING PLAN FOR CHIULUKIRE LOCAL FOREST -- YEAR 2000

OBJECTIVES:

1. To produce stand tables describing number of stems per hectare in each diameter class and species for purposes of use planning specific to species ranking exercises in the village resource assessment of 11/1999.

2. To produce rough estimates of cants per hectare as estimated by pitsawyers assisting in plot estimations, using statistical methods.

3. To develop rough estimates of broom plant populations in the areas surveyed.

4. To provide stand composition information for future analysis of forest types drawn on the satellite photo.

5. To keep up interest in forest management activities and maintain rapport with forest users while moving toward the goal of writing elements of the management plan later this year.

METHOD:

The sample scheme was a stratified cluster design with random selection of 32 primary units or "clusters" from intersections on a grid of approximate 800-meter squares. The list of possible clusters consisted of intersections off a 800-meter grid placed on the image photograph of the forest. Random selection was by using a table of random numbers.

The plan was based on 32 clusters because the limits of time dictated that four weeks were available for inventory this year. Based on productivity of (8 sample points per day) x (4 work days per week) x (4 weeks), 128 sample points could thus be taken. 128 sample points divided by 4 points per cluster = 32 clusters.

The allocation of the 32 primaries to strata drawn on the forest photograph was based on preliminary variance information based on tree counts gathered in May 1999. The most variable stratum was stand 4, and it was therefore assigned 12 clusters (48 sample plots) for its 2,600 hectares. Stand 5 with its 6300 hectares drew 12 primaries (48 sample plots) because it was slightly less variable and was also less accessible (accessibility is described as a "cost" in the allocation formula used, Levy and Lemeshow 1991). One extra cluster was added to stand 5 due to a location error in stand 7 near its edge; thus stand 5 had a total of 52 sample plots. Stands 1, 2, 3, and 7 were assigned two clusters each (8 plots) just to cover their relatively small areas of 100 to 600 hectares; as mentioned, one of these clusters was mislocated in stand 5 and therefore stand 7 contained 4 sample points only. As it happens, stand 7 is a relatively pure stand of msale (*Brachystegia bussei)* which should reduce the need for many plots anyway.

The first point in each cluster was located using compass, GPS, and 100-meter tape. Each of the other points in the cluster was located off the previous one. From the first plot, east or south was followed for 100 meters; from the second, south or west; from the third, south or west; and from the fourth, west or north, bringing the crew back to the beginning and the path out.

While traversing to the primary, notes were taken on wildlife sign, bamboos, and broom-laden areas.

At the sample point (plot), the inventory form that was tested in November 1999 was filled out using a 4- or 5-meter bamboo height stick, diameter tape or calipers, tree selection prism, and clinometer when needed. Input from village resource informants was used to describe volumes and products.

TEAM OF FOUR:

- One forester from Forest Department directed the crew, ran the compass, and viewed sample trees from the sampling prism.
- One person, the CLUSA forestry field coordinator, noted the data, assured that each field on the form was filled out, operated the GPS, and watched the time.
- Two resource informants from the management zone being measured performed the measurements and product estimations required for each field.

WEEKLY SCHEDULE:

The plan was to complete the inventory in 4 weeks using the team of four. It actually took a total of about 6 weeks.

Sites for camping were set up at facilitator compounds in Nthambwa Musonda, Ndelemani, and Gaveni as the team moved from west to east.

Forest Department and CLUSA personnel camped at the camping sites rather than return to Katete of Chipata each night.

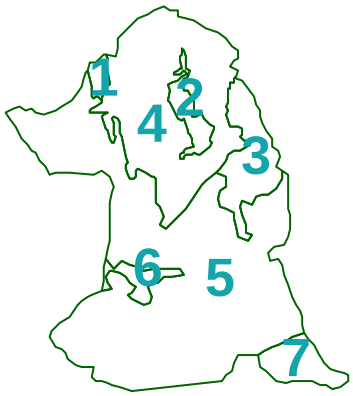
DATA PROCESSING:

Trees per hectare by diameter class were calculated for each stand using SAS and Excel software. Standard errors have been calculated only for stands 4 and 5 since they represent 85% of the forest area. These results are presented in the following pages.

Once trees per hectare by diameter class were described, the species ranked highest for each forest product use were separated out and mapped by density on Chiulukire maps. Ultimately, the total number of trees in each stand was divided up by “management unit” or Village Resource Management Area so that each VRMA knows about how many trees of interest are to be under their management. The level of sustainable annual harvest of these trees was also calculated based on the inventory results and the number of people involved in each occupation, in response to

the question: how long do these trees need to last? These specific data are reflected in the chapters treating each product.

STAND MAP:



TOTAL = 10,600 hectares (approximate)

APPROXIMATE STAND SIZES and descriptions:

1 – 100 hectares *(small sawtimber, charcoal (mopane and kamphoni), and broom species)*

2 – 260 hectares *(quality poles, bamboo, hives, young sawtimber, phingo, fodder)*

3 – 770 hectares *(bamboos, phingo, barkhives, charcoal species)*

4 – 2770 hectares *(kamphoni in many size classes, charcoal species, secondary sawtimber (B. bussei))*

5 – 6290 hectares *(few mukwa, many Brachysteg and kamphoni all size classes, Acacia and mchenja)*

6 – 200 hectares *(to be sampled in 2002)*

7 – 410 hectares *(kamphoni and Brachystegias, esp. B. bussei*