Publication Draft

REPUBLIC OF ZAMBIA

MINISTRY OF GREEN ECONOMY AND ENVIRONMENT

MACHINJE HILLS NATIONAL FOREST: P230 MANAGEMENT PLAN 2025-2035

APPROVAL PAGE

MACHINJE N HILLS ATIONAL FOREST No. P230 - FOREST MANAGEMENT PLAN

Notice of completion

This Forest Management Plan has been prepared in accordance with the requirements of section 40, Part IV of the Forests Act, 2015. National and local enquiries were conducted as required to obtain representation from the local community, Chief and other stakeholders in the prescribed manner. Further, consultations were conducted with holders of rights and the local community in the area and account taken of their submissions.

In accordance with section 43 of the Forests Act, 2015, I therefore cause notice of completion to be published in the Gazette.

Director of Forestry

Date:_____

Registration of the Forest Management Plan

Following receipt of notification from the Director of Forestry, that the Forest Management Plan has been notified in the Government Gazette in accordance with the provisions of section 43 of the Forests Act, 2015, I therefore cause this Forest Management Plan to be registered and approve a notice of registration to be published in the Government Gazette.

Minister for Green Economy and Environment

Date: _____

FORESTRY DEPARTMENT

FOREWORD

Forests provide essential functions and services to the local community and the country at large, conserving and protecting biodiversity, social and livelihood wellbeing. Zambia has adopted a participatory approach to forest management allowing community based natural resource management in respect to forest management between the Forestry Department whose function is to control, manage, conserve and administer Local and National Forests, promoting partnership with communities and civil society organizations. This forest management approach is driven by the need to promote sustainable use and management of forests across the country and reduce forest degradation and deforestation. The high demand for forest resource products and services due to increase in human population, and the ever-changing environmental conditions have highlighted the need to hasten the partnership approach to the management of forests in a planned manner. It is for this reason that Machinje Hills National Forest Management Plan (MHNFMP) has been formulated.

Signature:

Director of Forestry

Date:

ACKNOWLEDGEMENTS

The development of this Forest Management Plan was made possible through support from the Zambia Integrated Forest Landscape Project (ZIFLP). The Forestry Department would like to recognize and appreciate the efforts of their Royal Highnesses, Headmen and the community around the Forest for the commitment to support this plan and importantly the sustainable management of Machinje Hills National Forest.

In addition, the Forestry Department, Eastern Province, would like to recognize and appreciate the efforts of the participants in the consultation workshop for their valuable contribution to the development of the Forest Management Plan.

The production of the Plan would not have been possible without the input from ZAMSTATS, present and past officers of the Forestry Department. The contribution of the members of the forestry inventory, livelihood data collection, analysis and reporting teams who made it possible to generate the needed information to develop this Forest Management Plan is acknowledged. Local community contribution was vital in both the livelihood and biodiversity surveys as well as in the participatory discussion. Their Royal Highness' contributions during the awareness meetings leading to livelihood survey for the development of the FMP are also highly appreciated.

The Forestry Department acknowledge the financial support of the World Bank and its partners through the Zambia Integrated Forest Landscape Project (ZIFLP) in the development of the draft FMP. Finally, since it is not possible to mention each person engaged in the development of the FMP, the contribution of all persons who participated directly or indirectly in the preparation and completion of this document is appreciated.

EXECUTIVE SUMMARY

Forests, woodlands and trees are among the Nation's most important natural heritage resources. The vision of the National Forestry Policy, 2014 is to attain Sustainable Forest Management at all types of forests to enhance forest products and services that will contribute to mitigation of climate change, income generation, poverty reduction, job creation, protection and maintenance of biodiversity. The Policy encourages participatory forest management anchored on the active participation of local communities, traditional institutions, private sector and other stakeholders in the management and utilisation of forest resources at all levels of decision making, implementation, monitoring and evaluation.

This Forest Management Plan has been prepared for Machinje Hills National Forest with the aim of equipping the management team and other interested stakeholders with a capable tool of directing the approach to be followed, guiding the process of partnerships with key stakeholders and addressing the challenges facing the management of the forest at present. These in the case of Machinje Hills National Forest are extreme and if not addressed immediately may result in the loss of the forest and the functions it was reserved to protect. Adjacent communities can play an important role in the rational utilisation of the existing forest through participation in decision making, active management, protection and benefit sharing. Thus, community collaboration is an imperative so as to protect the remaining forest cover of Machinje Hills National Forest from degradation in order for it to fully contribute to local and national development as well as for the benefit of the future generations of Zambia.

Translating Policy into practice

This management plan translates National policies into a well-thought-out strategic framework to guide the preparation of annual operational programmes for effective and efficient management of this National Forest. The management plan will regulate forestry activities for a period of 10 years through the application of prescriptions that specify targets, actions and control arrangements. In this respect this plan will form part of the general forest management system that regulates protection, silviculture practices, conservation, monitoring and other relevant operations to ensure sustainable management of the forest.

Community based natural resource management is core to this Forest Management Plan. Through promoting community involvement in the management of Machinje Hills National Forest, rights to forest products and uses of the forest will be negotiated whilst agreeing obligations and other responsibilities for protection and management activities with local communities. This is intended to achieve the parallel goals of ending open access, promoting enhanced forest management, whilst unlocking the full potential of sustainable forest use for economic development in the local communities. Surrounding communities have both the most to lose from its destruction and most to gain from its good management. The Community Forestry approach followed in Zambia provides an incentive mechanism and capacity development process to make this a reality.

To ensure effective implementation, including monitoring, this plan has been prepared using up to date and accurate information on the reserve covering: location and extent; ownership and rights; topography, climate and soils; flora and fauna;

potential income and other benefits; challenges and opportunities for sustainable management. This forest management plan has the purpose not only of setting out approved management objectives and specified actions, but equally important, communicating these to the resource users and other stakeholders who are concerned with the implementation of the plan.

The Forest Management Plan was prepared through a consultative, interactive and participatory strategic planning process involving all key stakeholders. The data collection and consultation process was financed through the Zambia Integrated Forest Landscape Project (ZIFLP) a Zambian Government initiative in the Ministry of Green Economy and Environment.

Forest resource & community well being assessment

During 2021, the Forestry Department undertook forest resource assessments, engaging surrounding local communities and their traditional leaders as part of the enquiries for the purpose of preparing this forest management plan in accordance with the Forests Act, 2015. In parallel, ZAMSTATS undertook forest livelihoods and economic surveys with communities surrounding the National Forest.

Traditional leaders were consulted and approvals to proceed with data collection and subsequent participatory land use planning processes. Local stakeholder meetings were held with community representatives, local organisations and other Government Departments to raise awareness of climate change issues, the sources of greenhouse gas emissions in the province, sensitise on the policy and legal framework, the proposed collaborative planning approach, issues affecting the specific forest areas and exploring opportunities for a partnership for management.

The information collected allowed assessment of the condition of the forest, the value of the forest both economic as well as biodiversity value in terms of species diversity and abundance. Past management, exploitation as well as current management and pressures on the forest can be seen in the species abundance and size distribution in the areas assessed. These as well as the current Policies and development priorities can guide the short-, medium- and long-term management of Machinje Hills National Forest.

In view of the current condition of the forest, stratified sampling was use in the forest accounting for the degraded areas and land under settlement. The inventory results indicate a total standing volume for all species in the National Forest estimated at (18.07m^3/ha), with a total bole volume estimated at 6.17m^3/ha). Total Biomass for trees ≥5cm DBH is estimated 28.60 tonnes per hectare with an above ground carbon estimate of 14.30t/ha. A basal area figure of 2.67m^2 per hectare is a low figure for the type of forest by over a factor of 7. This confirms the status of Machinje Hills National Forest as a forest not achieving optimum growth potential.

Summary socio economic analysis

The livelihood survey conducted in 2021 indicated that the National Forest is surrounded by approximately 40 villages and institutions with a total population of 1,934. These households depend on farming as their main occupation, the principal crops grown are maize, sunflower and groundnuts from land holdings ranging between 0.25ha to 4ha. Almost all households use firewood as their energy for cooking at 96.3 percent and those who use charcoal at 3.7 percent. The survey also

revealed that all households surrounding the National Forest utilise the forest for everyday livelihood. The survey revealed that 90 percent of all the households were willing if called upon to voluntarily support management of the forest reserve with Forestry Department. At the time of the survey, there were serious encroachment in the reserve with a school within the forest.

Forest change & issues analysis

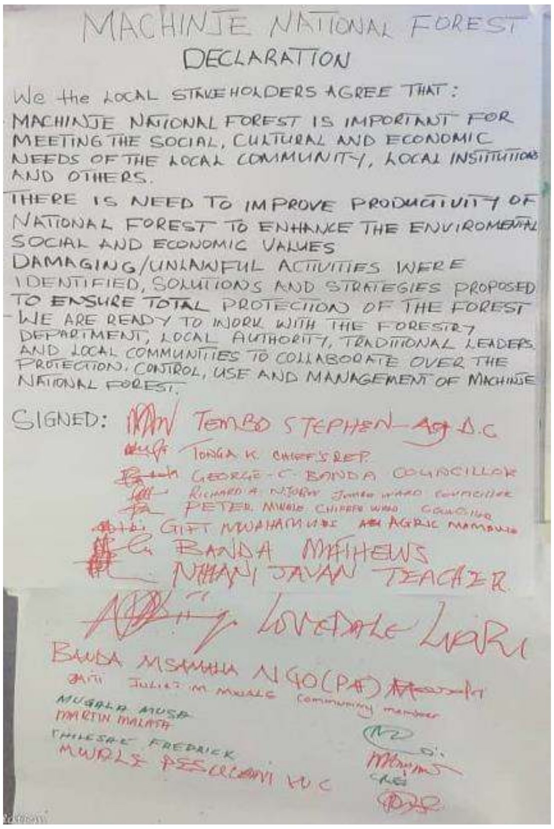
A consultation meeting of stakeholders for Machinje Hills National Forest was held on 23rd December 2023, at Council Hall in Mambwe. Participants were requested to review the uses and users of the forest, the issues that are contributing to forest loss and forest degradation, but importantly to propose local solutions to these issues. Utilising forest cover imagery, participants were able to relate to the areas of forest and forest loss through agriculture and settlement across the forest and surrounding areas. This was used to focus discussion on issues, identifying different zones of use and management, possible strategies and priorities for management as well as agreeing permitted and non-permitted activities within each of the identified zones.

Stakeholders' observations and Concerns

The stakeholders made several observations and raised some concerns notable among them include the following:

- The forest is important to the surrounding communities as well as a habitat for animals. Forest loss threatens everyone and everything that depends on this forest.
- There are serious encroachments in Machinje Hills NF, therefore there is need to protect what is remaining of the forest as well as bring it back to its former glory at the same time find a lasting solution to the illegal settlements.
- Need to change the mind-set of the people through awareness for them to appreciate the grave consequences of deforestation as well as need to provide sustainable/ alternative livelihoods.
- To resolve the inadequate human resource issue there was need to re-introduce community forest guards to police the Machinje Hills NF and need to stiffen laws.
- Headmen, senior headmen and Indunas, are allocating land to people coming from outside, in this regard consideration should be to ensure no further encroachments and means to restore the deforested area.
- The community forestry model should be promoted as it also promotes local ownership

Making a commitment to work together for change



As a statement of concern, but interest to work together with the Forestry Department, the Local Authority, Traditional leaders, and stakeholders agreed that there was need to collaborate over the protection, sustainable use and management of the protected forest area and a declaration of intent was signed pledging to collaborate in the sustainable management of Machinje Hills National Forest.

The declaration confirmed that the National Forest is of importance for meeting the local needs, social, cultural and economic needs of the surrounding communities as well as of environmental importance, primarily through securing local water resources. The stakeholders requested to work in partnership with the Forestry Department and others to safeguard the forest.

Objectives and management actions

Based on the policy and legal framework and the consultation process conducted, the General Objectives for the management of Machinje Hills National Forest are:

(a) To secure forest resources of local and national importance

(b) To protect and restore ecosystems, particularly the protection of land and water supplies of local and strategic importance.

(c) To ensure the sustainable utilisation of forest resources and other natural resources within the protected area.

(d) To ensure full participation of all stakeholders at all levels of society for sustainable forest resource and ecosystem management through appropriate incentives and benefit sharing mechanisms

(e) To meet the social, cultural and economic needs of the local community and wider society involved in management of the Forest in a gender equitable manner.

These in the case of Machinje Hills National Forest are urgent and if not actioned immediately may result in the loss of the forest and the functions it was reserved to protect.

Proposed management actions

The following management actions which are proposed for Machinje Hills National Forest reflect the statutory purpose of the National Forest as set out in section 12 of the Forests Act of 2015. The actions are intended to address and reverse the degrading factors threatening the current existence of the National Forest.

1 Forest Conservation through Community Participation and Livelihood Development

Community empowerment is central to participatory forest management for the effective coordination and sustainable management of forest resources. This Plan recognizes that communities surrounding Machinje Hills National Forest are key stakeholders in the conservation of this forest as well as beneficiaries from its sustainable management. This aims to meeting the social, cultural and economic needs and thereby improving the livelihoods of the communities around the National Forest. This will be achieved through promotion of community forestry and the establishment of a community forest management group to partner over the management of the National Forest, as well as a development of the immediate surrounding area to promote greenhouse gas emission reduction interventions.

2 Forest Protection, Restoration, Management and Conservation of Biodiversity

Machinje Hills National Forest is an important forest ecosystem containing different plant species and fauna. The forest is surrounded by an increasing population which is highly dependent on it for subsistence and increasingly economic needs including collection of mushroom, wild fruits, caterpillars, honey, firewood and poles. The level of unsustainable use is anticipated to intensify with increasing human populations resulting in higher levels of resource exploitation and degradation. Protection of this forest habitat is therefore essential to ensure the continued ecosystem services and local livelihood needs.

Without considering the needs of local communities, gaining their support, and working with them, rather than against them, forest protection and management goals and objectives will not be reached. Consequently, the strategy will be to work together with communities to develop joint protection systems in return for agreed levels of utilization within the capacity of the forest to meet subsistence needs whilst safeguarding the environmental aspects including conservation of biodiversity.

Safeguards & other crosscutting issues

In implementing the above management actions, cross cutting issues as well as other environmental and social safeguards processes will be mainstreamed in all aspects of forest management. Specific activities as well as the annual workplan and operational plans should include a process of social and environmental screening. These should be reviewed and updated in accordance with the type of activity being planned and general screening reviewed annually. A Grievance Redress Mechanism will be operational at the District and Provincial level to allow a mechanism for

grievances to be raised, documented and addressed. Documentation and tracking is core to this issue. Women shall be integrated into all aspects of management of Machinje Hills National Forest and empowered through equal participation in decision making, governance and benefit sharing.

Contribution to Emissions Reduction in Eastern Province

Improved management of Machinje Hills National Forest through the proposed interventions will directly address the need for emissions reductions through promotion of Sustainable Forest Management. This centres around expansion of community forestry and strengthening collaboration in the management of this forest and other protected forest areas in the province. Carbon sequestration will also be achieved through plantation forestry and locked in timber products.

Delivering sustained results

The expected outcomes of participatory management through local stakeholder involvement in the management of this and other protected forest areas will be to reduce emissions in the Eastern Province. Strengthening sustainable land and forest management practices, creating increased incomes and resilience of local communities, conforming to national strategies will reduce the effects of climate change. Implementing the proposed management actions should result in improved local livelihoods and local economic development, improved availability of major forest products whilst sustaining the key ecological functions of the National Forest and its surrounding area.

Definition of Terms

Above ground Biomass- refers to *vegetation above the soil, including stem, stumps, branches, bark, and foliage*

Basal Area- is the measure of cross-sectional areas of a tree trunk at breast height, typically measured in square meters per hectare

Below ground Biomass This is one of the carbon pools including biomass of the roots and organic matter

Biomass- refers to the total mass of living organisms in a particular ecosystem or biological community

Bole height - The distance from the base of a tree to the base of the living branch that part of the tree crown

Bole volume- refer to the amount of wood contained in the trunk or stem of the tree, typically from the ground level up to a point where the trunk reached a certain diameter or height. It is used in forestry inventory

Community Forest - refers to forest management that has ecological sustainability and local community benefit as central goal

Fauna- refers to the animals in particular region or ecosystem it includes all animal species that inhabit a given area from tiny insects to and microorganisms to large mammal and birds

Flora- refers to the plants, trees, flowers and other living organisms that are classified as part of the plant kingdom

Regeneration- refers to the process of renewing a forest or woodland to replace those that have been harvested or lost due to natural causes

Topography- refer to the physical features of a particular area of land, including its elevation, shape and relief

ACRONYMS

CAPI	Computer Assisted Personal Interviews
CCAs	Community Conservation Areas
CFMG	Community Forest Management Groups
COMACO	Community Markets for Conservation
CSA	Climate Smart Agriculture
DBH	Diameter at Breast Height
EA	Enumeration Area
EP-JSLP	Eastern Province Jurisdictional Sustainable Landscape Programme
FD	Forestry Department
FMA	Forest Management Area
FMP	Forest Management Plan
FPIC	Free Prior Informed Consent
GHG	Greenhouse Gases
GMA	Game Management Area
GMP	Game Management Plan
HFO	Honorary Forest Officer
MHNFMP	Machinje Hills National Forest Management Plan
MGEE	Ministry of Green Economy and Environment
MOE	Ministry of Energy
NGO	Non-Governmental Organization
REDD	Reducing Emissions from Deforestation and Forest Degradation
SFM	Sustainable forest management
USAID	United States Agency for International Development
ZAMSTATS	Zambia Statistics Agency
ZIFLP	Zambia Integrated Forest Landscape Project
MNF	Machinje National Forest.

TABLE OF CONTENTS

List of Figures

List of Tables

MACHINJE HILLS NATIONAL FOREST MANAGEMENT PLAN

1 INTRODUCTION

The Machinje Hills National Forest Management Plan (MHNFMP) is prepared in response to the National Forestry Policy of 2014 which has set forth clear guidelines to: "ensure adequate protection and sustainable utilization of forests, by promoting the development and use of forest and non-forest products by involving all interested key stakeholders particularly local communities around the forest reserve in the management of the forests and non-forest products in line with provisions of the Forests Act No. 4 of 2015. The Management Plan relates to the Machinje Hills National Forest which falls between Mambwe and Chipangali Districts, Eastern Province.

1.1 Purpose of the forest management plan

The purpose of the forest management plan is to guide the rural communities, traditional and local leadership, and Key stakeholders in collaboration with the Forestry Department during the exploitation and management of the forest resources of the Machinje Hills National Forest in a sustainable approach and manner. The plan will serve as a legal document to guide utilization and management of resources by local communities and key stakeholders around the forest and the Forestry Department through the Ministry of Green Economy and Environment (MGEE).

This Forest Management Plan aims to contribute towards the Goal of the National Strategy for REDD which is to reduce deforestation and forest degradation for sustainable natural resource management, improvement of livelihoods and achievement of a green economy.

1.2 Duration of forest management plan

The duration of the FMP is ten (10) years from the date that the plan is approved and registered in the Government Gazette. However, implementation of the Plan will be monitored periodically and evaluated at year 5 and may be adjusted accordingly as lessons are learned.

1.3 Policy Objectives

The Development Objectives for this Forest Management Plan are aligned with the objectives of the National Forestry Policy, 2014, which include:

> **Objective 1:** To manage the country's forest resources in order to maximize productivity and the development potential of the forest resources:
>
> **Objective 2:** To empower local communities and traditional leaders in order to ensure adequate protection and management of forests:
>
> **Objective 3:** To improve the role of forests in addressing climate change in order to contribute to reducing its impact through mitigation and adaptation measures:

1.4 General Management Objectives

The General Objectives for the management for the Forest Reserve include:

(a) To secure forest resources of local and national importance

(b) To protect and restore ecosystems, particularly the protection of land and water supplies of local and strategic importance.

(c) To ensure the sustainable utilisation of forest resources and other natural resources within the protected area.

(d) To ensure full participation of all stakeholders at all levels of society for sustainable forest resource and ecosystem management through appropriate incentives and benefit sharing mechanisms

(e) To meet the social, cultural and economic needs of the local community and wider society involved in management of the Forest in a gender equitable manner.

2 GENERAL DESCRIPTION

2.1 Location Details

Machinje Hills National Forest (Reserve No. P. 230) forms part of the forest estates in Eastern Province. The Machinje NF which falls between Mambwe and Chipangali Districts covers a land area of approximately 72,963.363 hectares in extent and is situated approximately 10Km north of the administrative centre of Mambwe District. The eastern portion of the National Forest lies in Chipangali District.

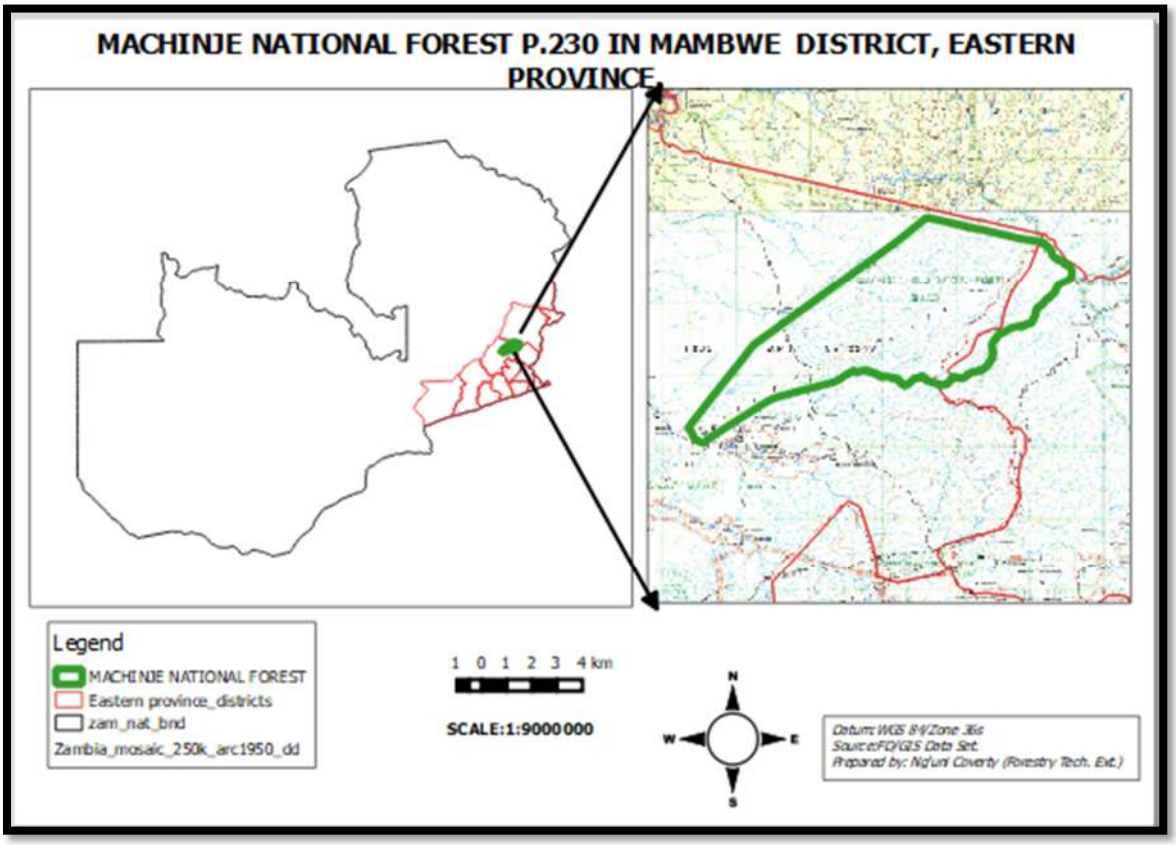


Figure 1: Map of Machinje Hills National Forest

The National Forest falls within the Lupande Game Management Area (GMA) in Mambwe District and mostly within the Upper Lupande Hunting Block. A detailed description of the gazetted forest boundary is provided in Annex 1.

2.2 Ownership and control

Machinje Hills National Forest No. P.230 was originally declared a forest reserve and gazetted under Statutory Instrument No. 158 of 1975 and deposited in the office of the Surveyor-General on Map No. FR298. It is a protected forest area with the designation of "National Forest" covered by section 12 of the Forests Act, 2015. Therefore, Forestry Department is responsible for the protection and management of this National Forest.

2.3 Reasons for Reservation

The reservation proposal was made wholly to protect land against floods and erosion, to preserve water supplies, by protecting the very numerous sources, and to protect the hill country stream and watersheds from risk of soil deterioration and erosion. The proposal was not made to ensure future supplies of forest produce to the neighbouring populations, though it will certainly assist in meeting these demands.

2.4 Physical and Biophysical Environment

Topography and Water Supplies, Geology & Soils

A long and rather narrow ridge running for North East to South West from end to end of the area forms a high backbone of granite. Below the base of this backbone the ground is gently undulating, except along the banks of the Rukuzi River and in the vicinity of the Msandile Gorge where the ground is broken and rocky. The lower reaches of the Msandile and Rukuzi rivers are frequently steep and cliff formations do occur. Water supplies generally are scarce.

Main Rivers: The Msandile River holds water in sandy beds all the year round to as far as its junction with the Mwatizi River. In September 1952 surfaces pools were in existence as far upstream as Chikwanda village. The Mwatizi holds water in the sand as far as upstream as 2 miles beyond Chitsulo Village.

The Rukuzi River does not have the same sandy bed as the Msandile and its tributaries. Long stretches of this river are waterless, even after digging. While other stretches are well watered for considerable distance.

Other sources of water: water was found at the point where the boundary crosses the Mwanagazi and Mulyaviponde rivers. Perennial water flows from springs near the sources of Chipembele, Chiswa and Nchingilonga streams. A large dambo situated $11^{1/2}$ miles south of the Nsefu Game Department Road and close to the boundary produced some water at a depth of 2 feet.

Geology and soils

The Mchinje Hills are granite outcrop, the rocks containing a high quality of quartz and schist. Shoulders off the main ridge outcrop at several places below the main river. Evidence of Mica and Asbestoses were found near the central portion. The soil is generally very shallow containing numerous round pebbles and bearing a crop predominantly of Mopani. Flatter and deeper pockets of soil have a grey sandy soil, while one area – limited in extent, is a red loan.

Rainfall & Temperature

The rainfall usually lasts for 5 to 6 months starting from November to March and the peak months are December and February. The rainfall amount ranges from 900 to 1000mm.

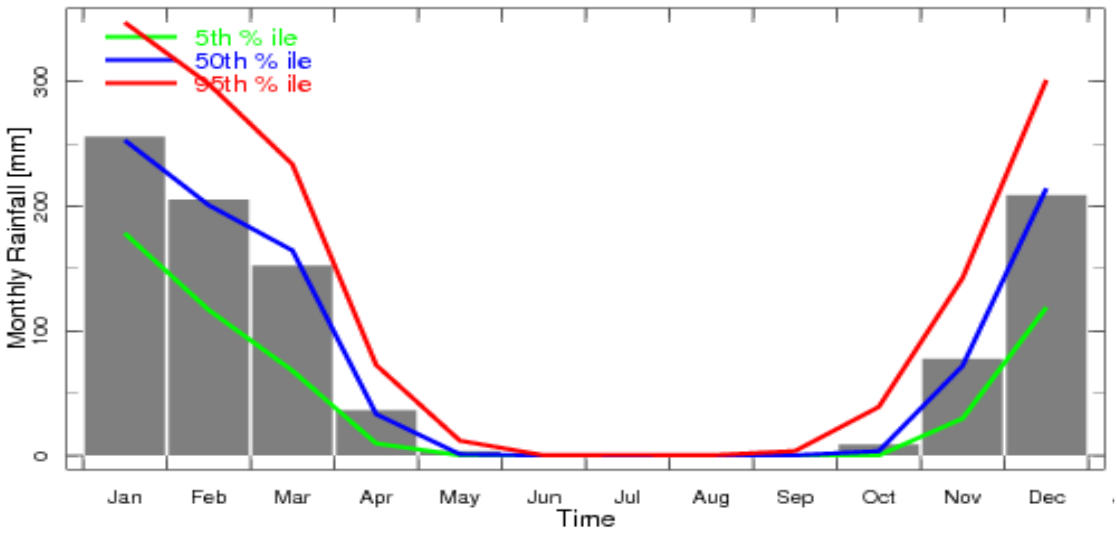


Figure 2: Monthly rainfall Source: The Zambia Meteorological Department

Normally, temperatures are very high, especially during the dry months which occurs between August and December. The maximum average monthly temperature is between 27C and 34 C. The highest maximum temperature occurs in October. The lowest average temperature is between 21^{0}C and 23^{0}C during the cool dry season occurring especially between May and June.

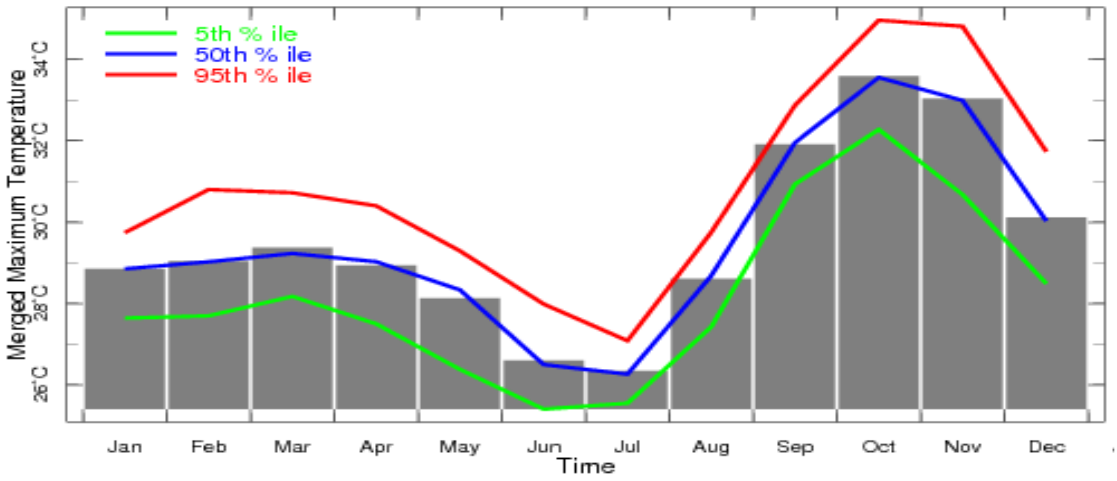


Figure 3: Monthly temperature Source: The Zambia Meteorological Department

Vegetation Type

Machinje National Forest is a homogeneous forest. The vegetation type is miombo woodland on the plateau with a diverse tree flora including *Julbernardia paniculata*, *Brachystegia boehimii*, *Brachystegia floribunda*, *Parinari curatellifolia* and many other species with *Brachystegia speciformis* being the dominant species.

Fauna

During both the reconnaissance survey and the forest inventory, there was physical observation of major wildlife as the reserve is within Lupande Game Management Area. An indication of their presence was recorded through observations such as footprints and droppings. Animals such as Vervet Monkeys, Warthog, Bush pigs, Antelopes, Guinea fowls and common Duikers are present. Smaller animal species such as squirrels, birds, Snakes and Lizards were encountered during the surveys.

.

3 PAST MANAGEMENT

The Machinje Hills National Forest was declared and gazetted in 1968. The management of the reserve has been guided by the objectives of reservation proposal as stated in the proposal at the time the forest was gazetted as a protected forest area under notice 24 of 1953 and subsequently under Statutory Instrument No.268 of 1970, 158 of 1975 and 148 of 1978. The reservation aimed at protecting stream catchment area, conservation biodiversity of indigenous tree species and securing the supply of forest and non-forest products for present and future generation in particular communities around the forest reserve.

The Public Service Reform Programme (PSRP) in 1997 and economic downturn, had an adverse impact on the management of the National Forest. This combined with an increase in population, high poverty levels resulted in increase pressure on the forest compounded by a department of reduced manpower. With the result, Machinje Hills National Forest has over the years been heavily encroached by influx of illegal settlers from surrounding areas and Chiefdoms. Agriculture, timber logging and informal land allocation for settlement are the major challenges facing the National Forest for some time. Various initiatives have taken place to address including meetings with Chiefs, stakeholder meetings and in 2018 a programme of issuing notices to those illegally settled within the Reserve. Most recently in 2023 and 2024, persons constructing illegal structures in the National Forest have been warned, on occasions key persons arrested and delivered to the High Court in Chipata for processing cases. Unfortunately, the outcomes have not favoured the Forestry Department.

The National Forest falls within the Lupande Game Management Area (GMA) declared through Statutory Instrument No 44 Of 1972 and protected by the Wildlife Act, 2015. The GMA has a draft Game Management Plan (GMP), prepared in 2011, though never signed into operation. The purpose of Lupande Game Management Area is to enhance community participation in conservation and integrated resource management in order to accrue benefits from natural resource management and tourism development. The National Forest falls within Zone IV – Forest Zone, but surrounded by Zone 3 - Conservation Limited Use Zone of the draft GMP. The purpose of Zone IV is to provide for conservation and development of forest with a view to securing supplies of timber and other forest produce, protection against floods, erosion and desiccation and maintaining the flow of rivers.

The draft GMP indicates Permissible Development for Zone IV as: Management and Operations, Infrastructure, Camp Sites, Picnic Sites Roads Recreation Facilities, Telecommunication Infrastructure. Bush Camps, Repeater Stations, Bridges and Culverts Water point. Prohibited Activities cover: Pollution, Illegal Logging, Cultivation, Settlements, Grazing, Entry without permit, Removal of beacons, removal of any forest produce without a licence, Uncontrolled Fires, Fire any tree, under growth and forest produce deforestation (including Illegal Charcoal production).

Leased area: In 2014 a lease agreement was entered into with the Kavulamungu Bargain Centre for a portion of the National Forest covering 10,000 hectares with an annual rental being paid to the Forestry Department for the purposes of a game

ranch subject to the provisions of the Wildlife Act. The tenant is required to ensure that the restrictions, in a forest reserve, subject to licences, are observed. See Annex 1 for the leased area.

Maintenance works

In 2018, Machinje National Forest boundary beacons were verified and new maps produced under the Forest Reserve Support Project funded by US Forest Service.

In 2021 ZIFLP supported the district officers to conduct boundary clearing and checking boundary beacons. In December 2021, sections of the National Forest boundary had been cleared. Boundary beacons were renewed where required. See Annex 1 for details and map. In 2022, signboards were erected to indicate the National Forest and restrictions therein. Sporadic prescribed burning has been implemented, most recently in 2021 and 2025.

4 GROWING STOCK

Assessing the growing stock of the forest is important in terms of ensuring Sustainable Forest Management. In basic terms, assessment is needed to ensure that the removal of trees and forest products does not exceed the rate of replacement in terms of growth and abundance. This is the basic principle of sustainable forestry otherwise the forest will be depleted and degraded.

A forest inventory was conducted by the Forestry Department in 2021 with financial support from the Zambia Integrated Forest Landscape Project. The following section provides the results and analysis from the data collected. A map of the location of the squares and therefore distribution of the sample plots for Machinje Hills National Forest is provided in Annex I. Measurement of trees and soils following the Department's Guidelines and the software *forestcalc* (version 6.4.1) used to process the data to provide the summary information contained in this chapter. The information collected allows assessment of the condition of the forest, the value of the forest both economic as well as biodiversity value in terms of species diversity and abundance. Past management, exploitation as well as current management and pressures on the forest can be seen in the species abundance and size distribution in the areas assessed. These as well as the current Policies and development priorities can guide the short, medium- and long-term management of the National Forest.

The following table presents the summary information from the forest inventory:

Stratum total by all species

Diameter Class	0-4	5-9	10-14	15-19	20-29	30-39	40+	Total
Vol (m^3)/ha	0	3.96	7.10	1.54	2.33	1.33	1.81	18.07
Bole Vol (m^3)/ha	0	1.37	2.53	0.57	0.69	0.43	0.59	6.17
Density/SPH	0	155.43	102.14	9.56	6.01	1.60	1.14	276.00
Basal area (m^2)/ha	0	0.70	1.14	0.21	0.29	0.14	0.19	2.67
Biomass, Total (Tons)/ha	0	6.11	10.89	2.33	3.59	2.37	3.31	28.60
Carbon, Total (Tons)/ha	0	3.06	5.44	1.17	1.80	1.19	1.66	14.30
Vol (m^3)/ha Sawlogs	0	0.00	0.00	0.01	0.00	0.56	1.04	1.61
Vol (m^3)/ha Poles	0	1.74	3.41	0.71	0.83	0.23	0.71	7.64
Vol (m^3)/ha Fruits	0	0.26	0.49	0.01	0.13	0.04	0.00	0.93
Vol (m^3)/ha Medicinal	0	0.87	1.17	0.33	0.71	0.01	0.04	3.16
Vol (m^3)/ha Firewood	0	0.07	0.14	0.01	0.03	0.00	0.00	0.27
Vol (m^3)/ha Others	0	1.00	1.87	0.46	0.63	0.46	0.00	4.41
Seedlings								2,257

Table 1: stratum total for all species

4.1 Tree species abundance

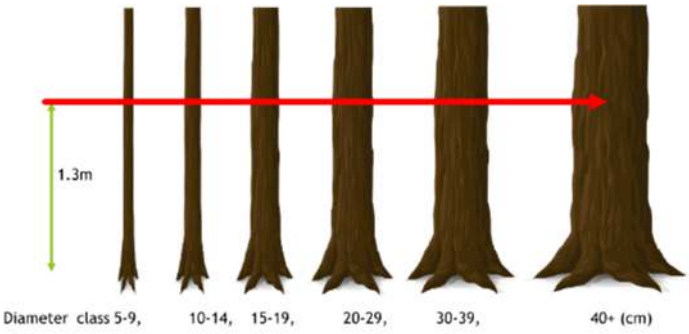
The inventory data indicates that there are over 44 different types' tree species that include tree seedlings in the forest. However, the ten most frequent species are shown below.

S/No.	Species	Local Names (Nyanja)	Species codes
1	*Bauhinia petersiana*	Mupondo	34
2	*Brachystegia boehmii*	Mufendaluzi	46
3	*Brachystegia bussei*	Mukongolo	47
4	*Brachystegia longifolia*	Bovu	49
5	*Bridelia cathartica*	Mkuviandola	57
6	*Combretum molle*	Kalama	86
7	*Combretum zeyheri*	Kalamafupa	89
8	*Diospyros mespiliformis*	Mchenja	112
9	*Diplorhynchus condylocarpon*	Mtowa	114
10	*Lannea discolor*	Shaumbu	194

Table 2: Top Ten Abundant Species in the Forest Reserve

4.2 Tree and Sampling Distribution by Size Classes

Size Class Distribution is a way to describe the structure of a forest by categorizing the tree population by size of the tree through measurement of each tree, its diameter-at-breast-height (DBH) in centimetres and allocating each measured tree into a size range as means to assess the tree population. Trees below 5cm are counted, not measured. The actual distribution of measured trees into various classes is then compared to a suggested "ideal" benchmark as an indicator of forest health and sustainability. The presence or absence of trees in various size classes informs the manager of past management, current stocking and the future growth potential of the forest.



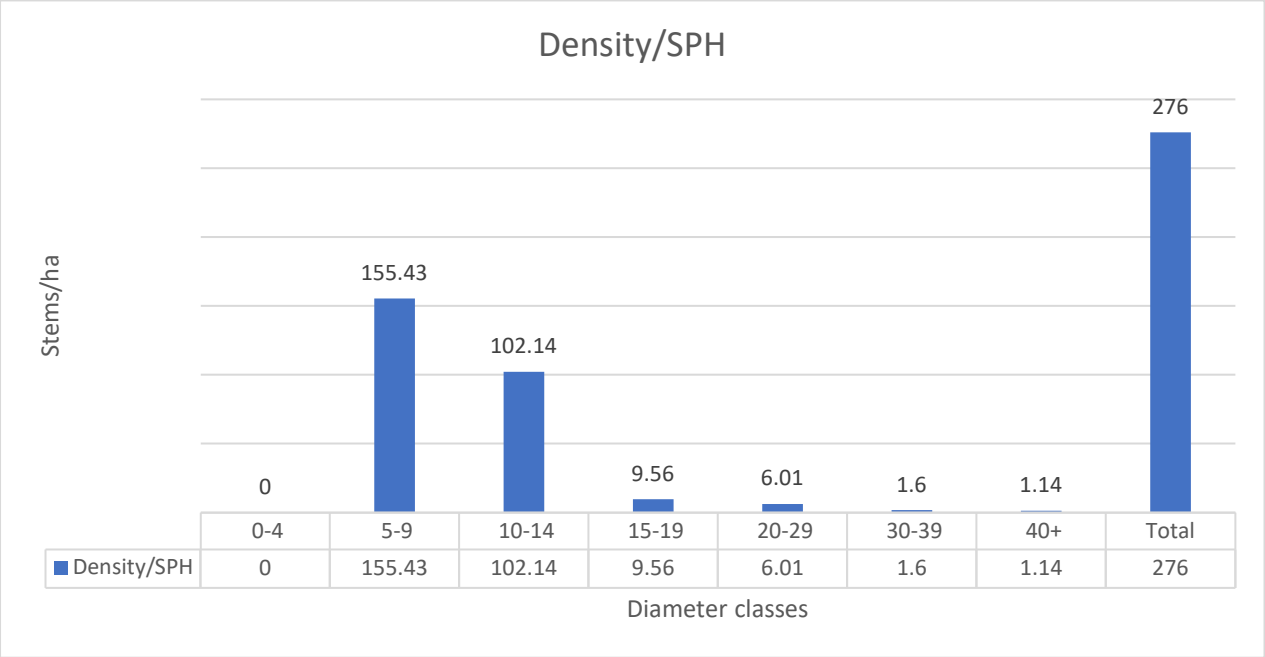


Figure 4: Density by diameter class/ha for all species

In Machinje Hills National Forest, a stocking density for trees ≥ 5 cm DBH was estimated as 276 stems per hectare.

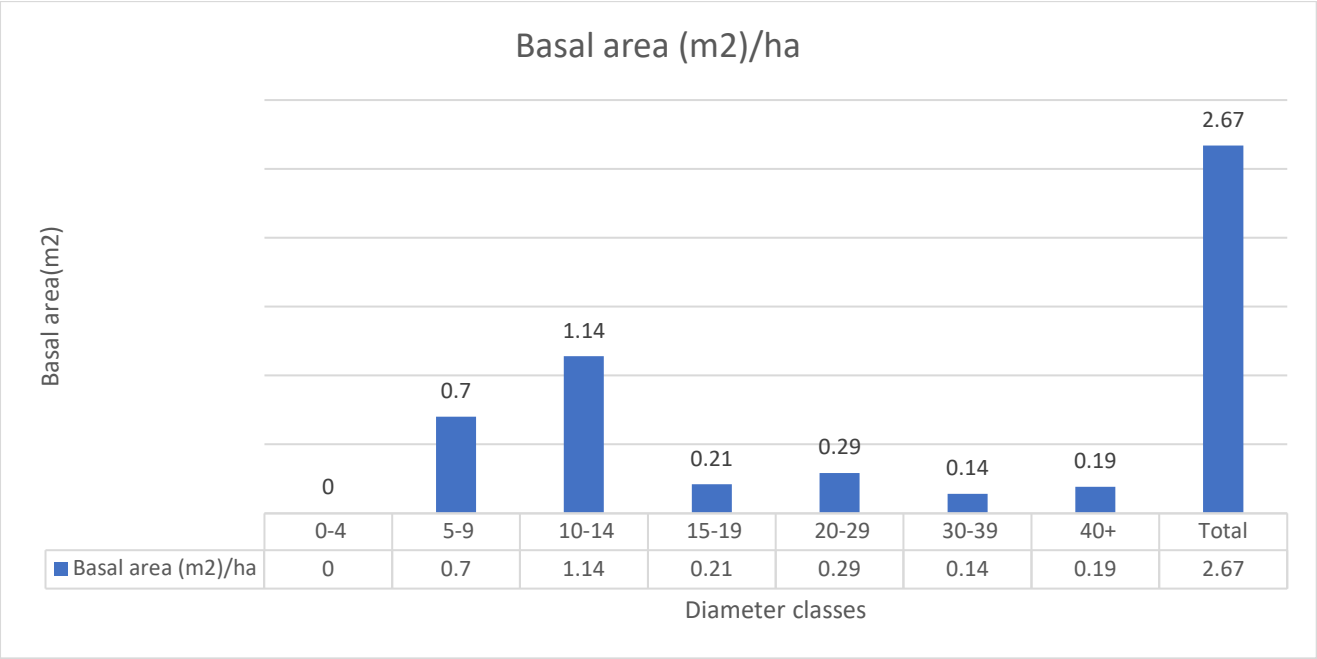


Figure 5: Basal area (m^2) by diameter class/ha for all species

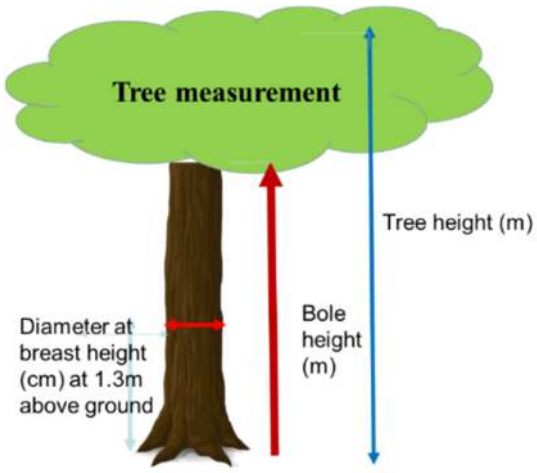
The stocking by diameter class basal area per hectare is more in 10 –14cm class. The data indicates that there has been much tree harvesting resulting in high coppicing and regeneration. This indicates that the forest in terms of growth potential is in a relatively healthy condition allowing succession from one size class to the next higher one. The data also indicates this is a primary/secondary forest as most hilly parts of the forest are still intact, compared to the larger part of the lower parts of the forest which has been severely deforested.

Forest condition is further assessed by the amount of area occupied by the stems of trees, termed basal area. This is measured by determining the cross-sectional area of a tree at breast height (1.3m), summing all the measurements and expressing this as a figure of square metre, either in their size class categories or as a total per hectare.

A figure of 2.67 m^2 per hectare is a very low figure for basal area in a similar type of forest type by over a factor of 7. This confirms the status of Machinje Hills National Forest as a forest of concern following past and most likely current high levels of exploitation of large sized trees.

4.3 Total Volume, Biomass and Carbon estimate of all Species

Calculating volume of the standing trees of DBH > 5cm is a further measure of the condition of the forest, site quality and previous management and exploitation. Tree volume to different heights is measured and calculated by individual trees and summed to give a total volume estimate per hectare. An estimate of the volume in a stand or plot is important for forests quantification and management decision making. The amount of merchantable wood in cubic meter (m^3) in a tree, as well as across the forest, was estimated while the trees are still standing using the methods of forest mensuration. Tree bole volume is based on the timber height relating to the parts of the tree that could be cut and sawn. Stand volume based on tree height is important for providing an estimate of total wood biomass resource. An assessment of carbon stocks was then estimated using the methodological framework developed by the IPCC.



The total standing volume per hectare for all species in Machinje Hills National Forest is estimated at 18.07m^3/Ha., with a total bole volume estimated at 6.17m^3/Ha. Total Biomass for trees ≥5cm DBH is estimated at 31.12 tones/ha, and it has carbon estimated at 28.6 tones/ha.

Technical characteristics

The volume of other technical characteristics or use are computed per hectare as follow: Saw-log 1.61m^3, Pole 7.64m^3, Firewood/charcoal 0.27m^3, Fruit 0.93m^3 and others 4.41m^3. The poles are evenly distributed mainly in diameter class 5 to 14 and less above 30. The saw log is minimal, less than 5 cubic meters per hectare. This indicates that the forest is under threat as there are extensive logging and illegal exploitation of forest resources.

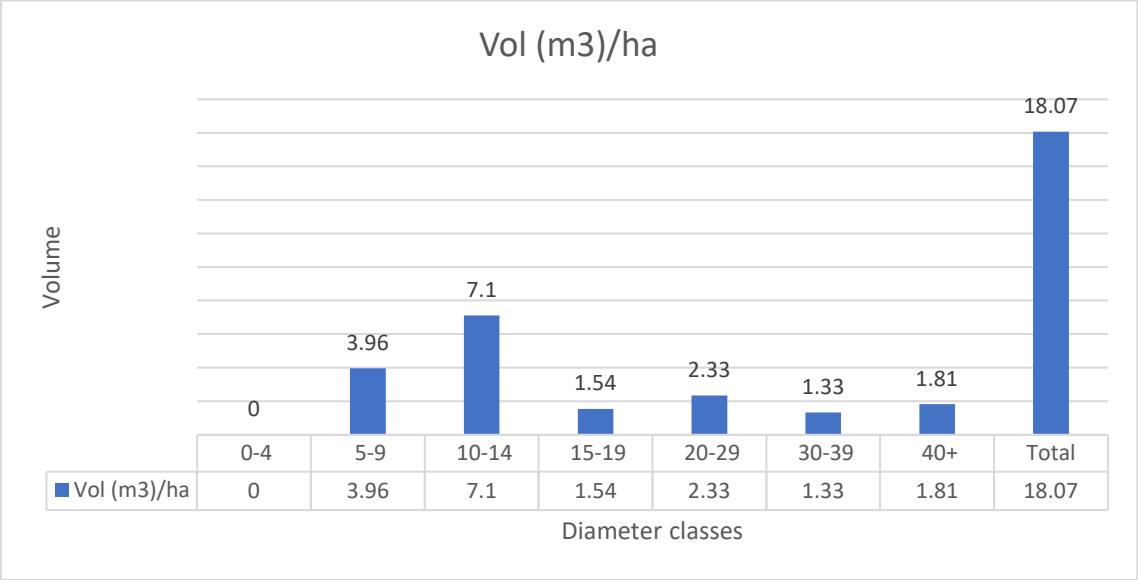


Figure 6: Volume (m³) by diameter class/ha for all species by use

4.4 Bole volume total by diameter class/ha for all species

The total bole volume by diameter class per hectare is 9.71 cubic meters with higher in diameter class 05 – 29 and less from 30 and above. The outcome indicates that there is a lot of tree harvesting resulting in high coppicing and regeneration mainly agriculture activities.

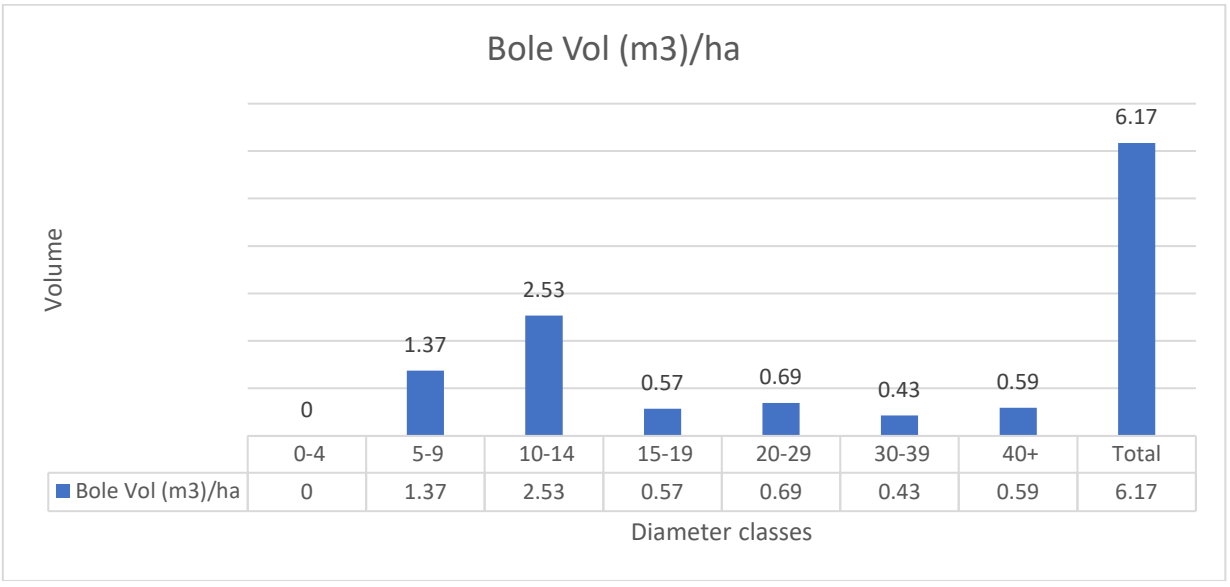


Figure 7: Bole volume (m³) by quality diameter class for all species

4.5 Presence of Commercial Tree Species

Based on the inventory data, species used for high valued sawlogs such Pterocarpus angolensis, Clolophospernum mopane, Swartzia madagascariensis, Pterocarpus chrysothrix and the medium valued are Brachystegia speciformis and Julbenadia globiflora, are not abundant in the forest. The harvestable volume is low. Therefore, Machinje Hills National Forest in its current condition cannot sustain large scale logging operations or timber concession because it is highly degraded and encroached in selected areas.

Volume of all species by use

No	Description	Volume(m^3/ha)	Explanation
1	Sawlogs	1.61	These are merchantable trees with the average diameter of 40cm dbh and above.
2	Poles	7.64	These are tree species with relative straight bole length with the average diameter at breast height of 5cm to 14cm.
3	Fruits	0.93	The tree species include all fruit bearing either edible or not edible.
4	Medicinal	3.16	All medicinal plants.
5	Firewood	0.27	These include all dead and or diseased trees which can be used for firewood.
6	Others	4.41	These include all tree species which are not classified in any of the above categories.

Table 3: Trees in Machinje Hills National Forest in terms of forest product categories.

Biomass and carbon above ground

Based on the inventory data, the biomass and carbon figures by size class and total are summarized. Note, the standing carbon and not the amount of carbon that may be traded under carbon trading schemes which are based on measured reduction of emissions.

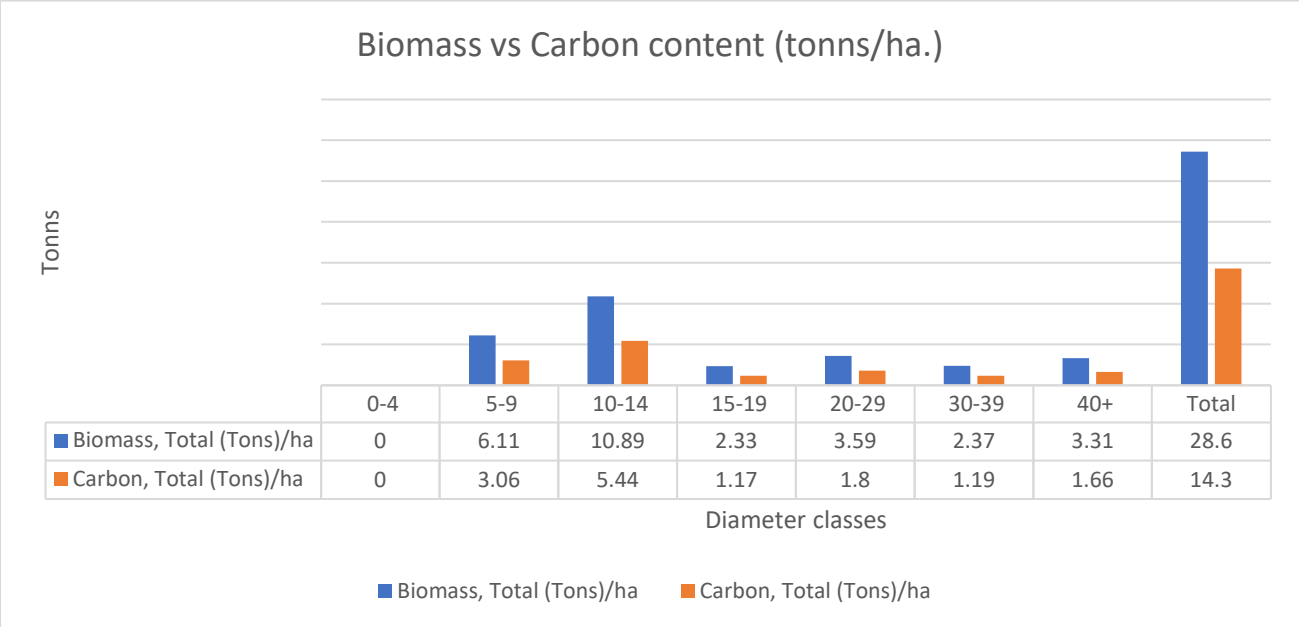


Figure 8: Biomass and Carbon above ground by diameter class/ha for all species

Biomass and Carbon total (tons) by diameter class/ha for all species

The total biomass and carbon stocks per hectare respectively of 28.6 and 14.3 estimates methodological framework applied is that developed by the IPCC documented in the 2006 guidelines for national greenhouse inventories volume 4, chapter 2 and 4. The correlation of total biomass and carbon both above and underground is in the figure above is within the IPCC requirement of half of biomass constitute carbon stock.

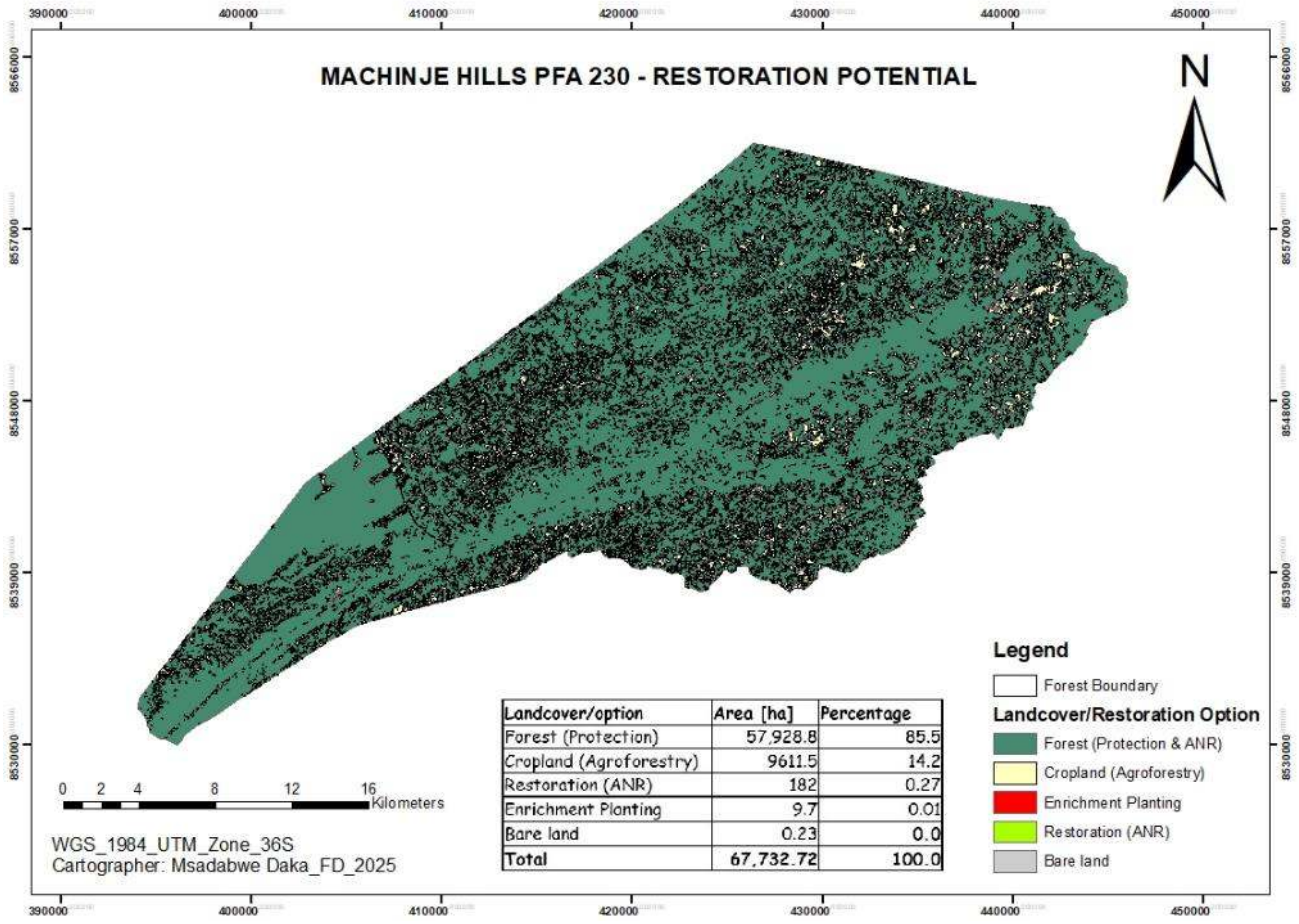
4.6 Forest condition and restoration assessment

To supplement the forest inventory data, a land cover assessment was conducted using Sentinel-2 2025 images (date filtered: 2024-01-01 - 2025-07-01) at a resolution of 30 meters. The area of different land classes was calculated using Compute Geometry in ArcMap. The results indicated the following:

Land cover category	Estimated area	Percentage
Forest	57,928.80	85.5
Cropland	9,611.50	14.2
Settlement with cropland	182.00	0.27
Water course	0.00	0.0
Degraded forest (open)	9.70	0.01
Degraded (scrub)	0.23	0.00
Total	**67,732.72**	**100**

Figure 9 Forest condition analysis 2024 by land cover

The remote sensing analysis data indicates that approximately 85% of the area has forest remaining, with the balance mainly under cropping or settlement. This indicates the current pressure on the forest and the high risk of further loss and degradation. Therefore the approach for Machinje Hills National Forest is to secure areas with forest cover and restore areas of lost forest cover with people's participation in order to improve environmental, social and economic impacts. The landcover analysis allows for identification of restoration strategies. These are outlined in the chapter on proposed management options.



Landcover/option	Area [ha]	Percentage
Forest (Protection)	57,928.8	85.5
Cropland (Agroforestry)	9611.5	14.2
Restoration (ANR)	182	0.27
Enrichment Planting	9.7	0.01
Bare land	0.23	0.0
Total	67,732.72	100.0

Figure 10 Restoration landcover and option analysis.

Restoration map narration

The projected restoration potential map was developed using Sentinel-2 2025 images (date filtered: 2024-01-01 - 2025-07-01) at a resolution of 30 meters. Land use land cover (LULC) classification was performed using a supervised classification method for accurate IPCC classes, with all computations performed in Google Earth Engine. The Normalized Difference Vegetation Index was calculated for: Forest Land, Cropland, Grassland, Wetlands, Settlements, and Other Land. Since forest shapefiles were utilized, the area of different land classes was calculated using Compute Geometry in ArcMap. Therefore, the combined area may not necessarily be the same as the original gazetted forest area.

5 SOCIO-ECONOMIC CONDITIONS

5.1 Livelihood Data Analysis

Forestry livelihood survey was conducted by the Zambia Statistics Agency (ZAMSTATS) Eastern Regional office, between November 2021. The main objective of the Forestry livelihood Survey is to measure the well-being of the communities dependent on Machinje Hills National Forest and to measure the utilization and management of trees resources. Also, to determine the benefits the surrounding communities derive from forest reserve. The demographic characteristics of any area are important in understanding the living conditions of the people through the impact they have on the prevailing situations. Furthermore, data on the demographic characteristics provide background information and the necessary framework for the understanding of other aspects of the population, including economic activities, poverty, and food security.

Methodology

The systematic sampling method was used to select households from each Enumeration Area (EA). The method assumes that households are arranged in a straight line and the following relationship applies.

Let K = N/n Where:
N = total number of households assigned sampling serial numbers
n = total desired sample size to be drawn from an EA
K = Sampling interval in each EA calculated as K = N/n

Data analysis
The 2021 forest livelihood survey was collected using Computer Assisted Personal interview (CAPI), using Tablets android Ver9. The CAPI system allows quality check of the data at the server (HQ) as it is collected. It also minimizes data entry errors after data collection, the data were subjected to extensive checks on their validity and consistency as it was synched to the server. Analysis was done using statistical package SPSS version 24, which was done by Mully Phiri.

5.2 Household and Population dynamics

Machinje National Forest as at 2021 livelihood survey was surrounded by approximately 40 villages and farming blocks as indicated in Annex: III with a total population of about 1,934. The main ethnic groups in the area are the Kunda's and Chewa's. The forest adjacent population are mostly small-scale farmers who utilize the forest for some of their livelihood requirements. The main crops grown are Maize, Sunflower, Soya beans and groundnuts. The land tenure of the population surrounding the Machinje NF is mostly under customary land tenure system. Those households within have formal no title deeds or letter of allotment.

Level of Education

Education is one of the fundamental factors that enhance the well-being and quality of life for persons and for entire society. Education, therefore, has profound effect

on the population's welfare in terms of health, employment earnings, poverty levels and nutrition. Education levels of the head of households in the Villages/Localities surrounding the Machinje National Forest was found to be mainly primary level that contributed 60 percent, while tertiary contributed about 2.5 percent. The rest being No formal education and secondary education indicating 7.5 percent and 30 percent respectively. As shown in the table below:

Level of education	Percent
No education	7.5
Primary	60.0
Secondary	30.0
Tertiary	2.5
Total	**100.0**

Table 4 Education levels attained.

However, it should be noted the presence of primary schools within the gazetted area of the National Forest.

Figure 11: A Community School inside Machinje Hills National Forest

Economic activity

Machinje Hills NF population depends on farming as their main occupation. The results showed that 76.2 percent of the household population surrounding the National Forest had farming as their main occupation, while the rest of economic activities contributed 15 percent those in paid employment and 8.8 percent in small businesses.

Main economic activity	Percent
Business	8.8
Employment	15.0
Farming	76.2
Total	**100.0**

Table 5: Percentage distribution of main economic activity

Types of energy used for cooking.
Almost all households in the localities surrounding Machinje National Forest use firewood as their energy for cooking. The livelihood survey revealed a percentage of about 96.3 percent using firewood as energy for cooking while 3.7 percent use charcoal as energy for cooking. It shows how threatened the forest is as every household depends on the forest for cooking energy.

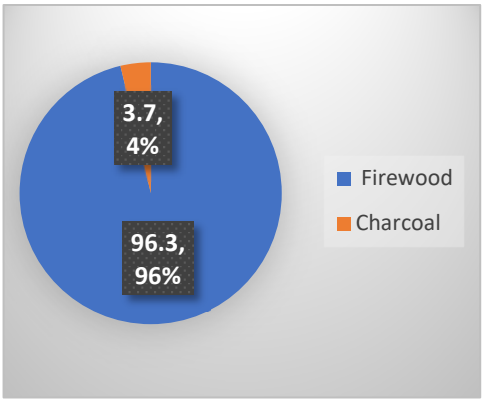


Figure 12: Types of energy used for cooking

Main tree resources used for firewood.

The main tree resources used for firewood by households in the localities surrounding the Machinje Hills National Forest are as shown in the table below.

S/No.	Species	Local Names(Nyanja)	Species codes
1	*Bauhinia petersiana*	Mupondo	34
2	*Brachystegia boehmii*	Mufendaluzi	46
3	*Brachystegia bussei*	Mukongolo	47
4	*Brachystegia longifolia*	Bovu	49
6	*Combretum molle*	Kalama	86
7	*Combretum zeyheri*	Kalamafupa	89
8	*Diospyros mespiliformis*	Mchenja	112
9	*Diplorhynchus condylocarpon*	Mtowa	114

Table 6: Shows the main tree resource used for firewood.

Note: these species are therefore under serious threat for wood energy as the statistics can show and mitigation measures are required in the management plan.

Non wood Forest products
The main Non wood forest products used by households surrounding the Machinje NF are as shown in the table below.

Non wood Forest products
• Mushroom • Caterpillars • Fruits • Honey

Table 7: Non-Wood Forest Products used by households surrounding the MHNF

Willingness of community to participate in forest Management of the forest reserve

The livelihood survey revealed that 90 percent of all the households interviewed were willing if called upon to voluntarily support management of the forest reserve with the Forest Department and other stake holders in the community.

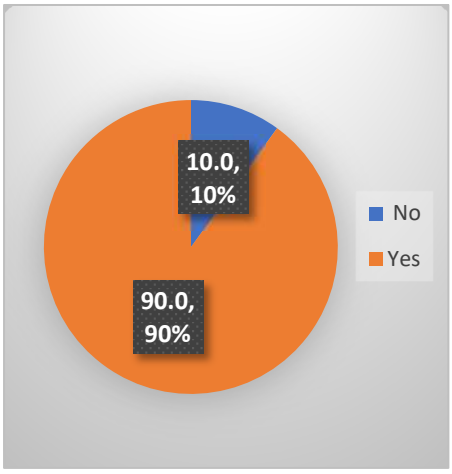


Figure 13: Distribution of willingness to participate when called upon to support FM

Land Occupation

The livelihood survey for the communities surrounding the Machinje Hills National Forest revealed that most of the land is owned by households that showed 86 percent ownership compared to those who don't own at 14 percent. All land occupied by households is mainly used for agriculture purpose.

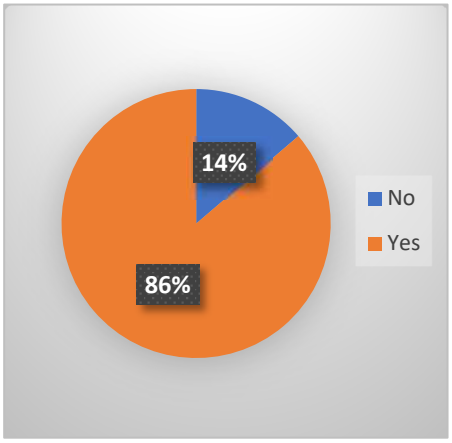


Figure 14: Land occupation

Willingness to plant trees on land occupied.

The survey revealed the willingness to planting trees by the households owning land. Those willing to plant trees on their land contributed 80 percent, while those not willing to plant trees had 20 percent contribution as shown in the figure below.

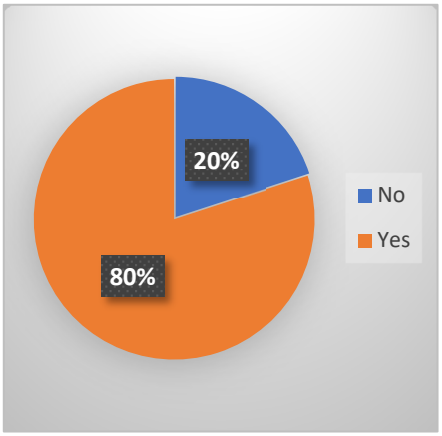


Figure 15: Willingness to plant trees on land owned

5.3 Utilization, issues and solutions proposed by stakeholders

Machinje Hills NF forest consultative meeting held on 23rd December 2023, the stake holders identified the uses and users of the forest reserve.

The uses where identified:

1. Firewood
2. Charcoal
3. Fruits, Mushroom, Caterpillars, honey
4. Medicine
5. Timber production.

The Users of the forest:

1. The community surrounding Machinje NF
2. Animals
3. Incomers

ISSUES	SOLUTIONS
- Deforestation - Late burning - Illegal settlement - Loss of forest land to agriculture - Illegal allocation of land by some tradition leaders	- Reforestation - Early burning/fire break - Eviction - No expansion of farmland - Sensitization management among the leaders/coordination

5.4 Enterprise opportunities

A healthy forest ecosystem provides a strong foundation for income generation through forest products by maintaining biodiversity, soil fertility, and water resource essential for their sustainable production. When forests are in good ecological condition, they support the growth of high-value timber and Non-Timber Forest Products (NTFPs) which local communities and others can harvest and commercialize in a regulated manner. A well-managed forest ensures a continuous supply of these resources without depleting them, allowing for long-term economic benefits.

Machinje Hills National Forest provides a number of income generation/enterprise opportunities based on the current forest condition, the interests of local communities and other stakeholders, but particularly based on the commitment to sustainable forest management through agreed institutional arrangements already described. The foundations for community-based forest enterprises can be built on the elements of forest resource condition and associated forest product availability, access to markets, an identified enterprise group and importantly, overall governance arrangements to regulate access, use and protection of the forest.

Through the resource assessment and mapping exercise, combined with the socio-economic survey, and stakeholder consultation, the following enterprise opportunities have been identified:

Potential Forest product enterprises

- Beekeeping
- Wood biomass energy production
- Wild fruit and mushroom harvesting
- Nature based eco-tourism through public, private, community partnerships

The development of the above identified opportunities would be subject to conduct of specific forest product value chain analysis and enterprise development assessment to ensure a viable and financially feasible forest-based enterprise could be promoted in line with the Forestry Department Forestry Enterprise Strategy for 2025-2030. This strategy seeks to promote sustainable forest management while enhancing value addition in forestry value chains through empowering local communities.

5.5 Encroachment – illegal settlement, cropping and mining

Machinje Hills National Forest currently is in a dynamic state due to external pressure factors. However, the reasons for encroachment in forest reserves across the country are many, and may differ from one province to another or from district to district, but for Machinje Hills National Forest, high pressure for land through clearing for agriculture and settlement expansion are evident as well as illegal harvesting of forest products (both wood and non-wood). Over the years, various initiatives have taken place to address including meetings with Chiefs, stakeholder meetings and a programme of issuing notices to those illegally settled within the Reserve. In addition, a number of settlements with permanent structures are located within the gazetted forest area. In 2018 a programme of issuing notices to those illegally settled within the Reserve was conducted following a nationwide instruction from the Minister of Lands and Natural Resources. Recent attempts to notify and evict encroachers and those allocating land in the National Forest are described in the past management section. Further, recent reports of illegal mining have been noted.

The stakeholder meeting of December 2023, attendees expressed concern to the levels of encroachment. Some encroachment has unfortunately been with the blessing of local leaders while others had occupied areas without any local association. The local authority has made attempts to address the situation though the scale of encroachment is concerning.

A series of operations to ensure boundary beacons are in place have been conducted with a recent programme of replacing and painting beacons by the Forestry Department.

Initiatives to address and reverse the situation with a view to restore more of the ecological function of the National Forest as well as meeting the social, cultural and economic needs of the local community are set out in the following chapter.

6 PROPOSED MANAGEMENT ACTIONS

In view of the current condition and rate of deforestation and forest degradation being experienced across this National Forest, the overall objective is to secure the ecological functions of the forest through engaging local stakeholders and surrounding communities and agree new strategies for management and restoration of the National Forest. This includes applying the community forestry process which supports community control, use and management of forest areas in partnership with the Forestry Department. All approaches will conform to the stated purpose of a National Forest as described in section 12 of the Forests Act, 2015:

Purpose of National Forest

12. Subject to the other provisions of this Act, all land comprised in a National Forest shall be used for—

(a) the security of forest resources of national importance;

(b) the conservation of ecosystems and biological diversity;

(c) improved forest resource management and sustainable utilisation of forest resources; and

(d) the management of major water catchments and head waters, subject to the Water Resources Management Act, 2011.

Act No. 21 of 2011

The emphasis will be on Forest Landscape Restoration (FLR) as a process for regaining ecological functionality, increasing availability of resources and therefore enhancing values across deforested or degraded forest landscape of Machinje Hills National Forest. The approach will be to secure areas with forest cover and restore areas of lost forest cover with people's participation in order to improve environmental, social and economic impacts. In order to achieve these impacts, the main management strategies identified focus on steps to protect, restore and replant, as follows:

- **Protect** - areas where the forest is intact with local stakeholder involvement.
- **Restore -** the forest where it is degraded by promoting regeneration encouraging regrowth of local species or re-afforestation with people's participation.
- **Replant**-increase forest cover through planting tree species in fields where cropping is taking place. This aims to increase tree cover, soil fertility, provide fodder and small biomass for energy needs. Further, re-afforestation through planting of indigenous or exotic species in abandoned fields in a plantation environment where practical.

Opportunities for collaboration with partners and seeking investment and sustainable financing through climate change mitigation / emissions reduction trading, expanding concessions areas will be explored to provide the investment, incentive and reward for sustainable land management in the forest. Sharing benefits from the anticipated Jurisdictional Sustainable Landscape Programme will be core to the process of incentivizing and rewarding good practices in mitigating the effects of climate change and providing the mechanism for monetary benefits to accrue to local communities and other service providers from carbon trading by Government.

6.1 Zoning the forest for effective management of the forest

This management plan recognizes the stakeholder consultation of December 2023, which identified use of the forest, the main users of the forest, issues affecting Machinje Hills National Forest, local solutions and permitted activities. The immediate area surrounding the National Forest to act as a buffer which will focus on development as well as emissions reductions related activities.

Forest Protection, Management and Conservation of Biodiversity

Machinje National Forest is an important forest ecosystem containing different plant species and fauna. The National Forest also falls within the Lupande Game Management Area. As a catchment forest, the National Forest provides an important function to safeguard downstream communities through rainwater interception and release. However, the level of unsustainable use is anticipated to intensify with increasing human populations resulting in higher levels of resource exploitation and degradation. Protection of this forest habitat is therefore essential to ensure the continued ecosystem services and local livelihood needs.

However, without considering the needs of local stakeholders and communities, gaining their support, and working with them, rather than against them, forest protection and management goals and objectives will not be reached. Consequently, the strategy will be to work together with communities to develop joint protection systems in return for agreed levels of utilization within the capacity of the forest to meet subsistence needs whilst safeguarding the environmental aspects including conservation of biodiversity in this protection zone.

Forest Restoration area

This covers the areas already impacted by human activity including seasonal and permanent farming including settlement. The main focus within this area is to re-establish tree cover and therefore conform with the purpose of the National Forest. This will involve promoting forest restoration approaches, agroforestry and tackling the core issue of encroachment through a variety of initiatives. Continuation of environmentally harmful crops such as cotton and tobacco growing within the National Forest should be reviewed.

Development buffer area:

This is the area immediately surrounding the reserved forest area where farming and settlements are located. Much of this area is already covered by community forest areas (Jumbe and partly Mwanya), but also community conservation areas (CCAs) supported by COMACO on the southern boundary. The eastern boundary fall with Chinunda Chiefdom where there is not a protected community area. These will be the focus for forest extension activities, creation of community and household woodlots, use of energy efficient stoves, promotion of agroforestry and other climate smart agricultural activities.

These areas of action will be managed in partnership with the local community following the community forestry approach as set out in the Forests (Community Forest Management) Regulations, 2018, and the National Guidelines for Community Forestry, 2018. This will be covered by a Community Forest Management Agreement, management plan and local resource use rules which set out both rights and obligations for control, protection and management of the identified forest area. Annual work plans will be developed by the community with technical guidance from the Forestry Department to ensure the sustainable management of these areas.

All areas of action will be managed in partnership with the local community and other stakeholders including the Department of National Parks & Wildlife as the National Forest falls within a Game Management Area (GMA). It is important therefore that the protection and management of the National Forest is aligned with other protection systems and institutional arrangements and any General Management Plan for the GMA.

6.2 Forest landscape restoration guiding principles

Successful forest landscape restoration (FLR) integrates a number of guiding principles, including:

- *Focus on the entire landscape*. Consideration and restoration across the entire landscape of MLF as opposed to individual sites. This entails balancing a mosaic of land uses across the gazetted forest, such as securing intact forested areas, regenerating degraded forests, promoting agroforestry systems, climate smart agriculture, well-managed plantations where appropriate, as well as identifying ecological corridors and riparian strips to protect watercourses and waterways.
- *Restoring ecological functions.* Restore the ecological functionality of the landscape, such as its richness as a habitat, its ability to contain erosion and floods, and its resilience to climate change and various disturbances. This can be done in many ways, one of which is to restore the landscape "back" to the "original" vegetation, but other strategies may also be used, ranging from natural regeneration to tree planting.
- *Allowing for multiple benefits.* Increasing tree cover across the landscape including existing cleared farmed areas, without necessarily forming a forest canopy, in order to enhance food production, reduce erosion, provide shade, and produce firewood. In other places, trees may be added to create a closed canopy forest capable of sequestering large amounts of carbon, protecting downstream water supplies, and providing rich wildlife habitat.
- *Promoting stakeholders' involvement.* Actively engaging local stakeholders in decisions regarding restoration goals, implementation methods, and trade-offs for sustainable land management practices which provides incentives and performance benefits.
- *Adaptively managing* the restoration strategy over time as environmental, social and economic conditions evolve supported through continuous monitoring and learning through the restoration process.

6.3 Core Forest Management actions

The identified management actions are described as follows:

Action 1: Forest Protection, Management & Conservation of Biodiversity

Machinje Hills National Forest is an important forest ecosystem containing a number of different plant species and fauna. The forest is impacted by an increasing population which is highly dependent on it for subsistence and increasingly economic needs like farming as well as collection of mushroom, wild fruits, caterpillars, honey, firewood and poles. The level of unsustainable use is anticipated to intensify with increasing human populations resulting in higher levels of resource exploitation and degradation. Protection of this forest habitat is therefore essential to ensure the continued ecosystem services and local livelihood needs. However, the awareness of the importance of ecosystem services, conservation of biodiversity and climate change mitigation services of Machinje Hills National Forest is low among the adjacent communities.

Forest protection is therefore key in the sustainable management of forest resources. Traditionally, patrolling has been relied upon as the main protection activity but, despite these efforts and in view of the staffing levels, it has not been possible to control the level of unregulated use. Experience has shown that adequate levels of forest protection cannot be achieved through confrontation and conflict between the managers and forest-adjacent communities. In practice, both local people and the government have a mutual interest in conserving the forest, and utilizing forest products in a sustainable way. Without considering the needs of local communities, gaining their support, and working with them, rather than against them, forest protection and management goals and objectives will not be reached. Consequently, the strategy will be to work together with communities to develop joint protection systems in return for agreed levels of utilization within the capacity of the forest to meet subsistence needs whilst safeguarding the environmental aspects including conservation of biodiversity.

Therefore, the following are the 7 steps that the stakeholder communities have to be taken through in order to develop a full partnership for shared management:

1. Stakeholder engagement, community awareness raising and mobilisation;
2. Stakeholder mapping including forest use, users and geographic interest.
3. Forming community level institutions to coordinate, manage and control local resource use in partnership with the Forestry Department.
4. Developing forest product and issues based operational management plans for areas of interest.
5. Agreeing roles, rights, responsibilities and obligations for shared management.
6. Implementing practical forest protection and management interventions that bring value and other environmental and social benefits.
7. Conducting joint monitoring and evaluation of management and benefit sharing measures to ensure a sustainable partnership.

These 7 steps to establishing shared management responsibilities and benefit sharing directly mirrors the 7 steps of the National Guidelines for Community Forestry in Zambia. Therefore, tangible steps will be taken to incentivise and reward local stakeholder communities in the protection and management of Machinje Hills National Forest through following the community forestry development steps and processes. In order to achieve this the following activities will be undertaken;

No	Specific Objectives	Strategy	Actions	Responsible	Indicators
1	To develop a shared management approach to forest protection, management and utilisation.	1. Stakeholder engagement, community awareness raising and mobilisation;	Conduct awareness meetings with traditional leadership & communities	FD	Meetings conducted
		2 Stakeholder mapping including forest use, users and geographic interest.	Conduct meetings to determine effective span of management control across MNF	FD	FPIC Meetings conducted
		3. Forming community level institutions to coordinate, manage and control local resource use in partnership with the Forestry Department.	Through participatory processes, form local committee responsible to coordinate and assist management of the MNF	Community groups & FD	
		4. Developing Forest product and issues based operational management plans for areas of interest.	For each Zone and area of shared management, development management plans and resource use rules		
		5. Agreeing roles, rights, responsibilities and obligations for shared management.			Signed CFM agreements. Annual work plan reports
		6. Conducting joint monitoring and evaluation of	See monitoring section of MNFMP		

No	Specific Objectives	Strategy	Actions	Responsible	Indicators
		management and benefit sharing measures to ensure a sustainable partnership.			
2	To protect the Forest from late fires	Practice early burning within and outside the forest by involving local communities.	-Conduct prescribed and early burning. -Training the local communities on fire management techniques -Sensitizing the local community on the importance of early burning.	FD/ Adjacent communities	Area in hectares of controlled burning
3	To secure the boundary and define the extent of the boundary and prevent possible encroachment	Involve forest adjacent communities in Forest protection and management.	-Carry out annual Boundary maintenance. -Beacon maintenance - Erection of sign post on roads entering the Forest	FD/ Community	Distance in km of forest perimeter cleared
4	To conserve and enhance the biodiversity of the forest reserve through environmental awareness and education.	Enhance understanding of the forest ecosystem and its function and benefits to community groups and schools.	-Awareness on biodiversity with regard to indigenous knowledge. -Promote local participation and ownership through meetings.	FD/NGOs	
5	To ensure protection against pests and human damage	Frequent monitoring of forest resources	Inspections for diseases and pests and detection of possible illegalities.	FD/ Community	Hectarage of forest protected from pests and human damage
6	To significantly reduce levels of illegal forest product harvesting.	Involve the local communities in the management of forest resources in order to create a sense of ownership.	-Conduct sensitization meetings. -Conduct forest patrols.	FD/ community and other security wings	Number of illegal harvesters/ activities reduced

No	Specific Objectives	Strategy	Actions	Responsible	Indicators
		Engage honorary forest Officers/guards			
7	Improve local awareness of biodiversity and its value.	Seek greater participation of local communities in research and other biodiversity activities Such as eco-tourism, with the result that biodiversity values will become of more direct relevance to them.	1.Conduct research that documents and utilizes the indigenous knowledge of Forest-adjacent communities. 2.Promote local participation and benefits from eco-tourism as a means of creating better awareness of biodiversity	FD/Forestry Research	Levels of community participation in forest management activities is sustained over time.

Action 2: Forest Restoration through Community Participation & Livelihood Development

Community empowerment is central to participatory forest management for the effective coordination and sustainable management of forest resources. This Plan recognizes that communities surrounding and within Machinje Hills National Forest are key stakeholders in the conservation of this forest as well as beneficiaries from its sustainable management. This action aims to meeting the social, cultural and economic needs and thereby improving the livelihoods of the communities around and within the National Forest. Within this management action, the following interventions will be undertaken in the National Forest as well as extension services and activities in restoration areas, the areas surrounding the National Forest;

- Promotion of community forestry and the establishment of a community forest management group;
- Promote interventions with community groups to protect, restore and replant, as follows:
    - **Protect** - areas where the forest is intact with local stakeholder involvement;
    - **Restore -** the forest where it is degraded by promoting regeneration encouraging regrowth of local species or re-afforestation with people's participation.
    - **Replant-increase Forest** cover through planting tree species in fields where cropping is taking place. This aims to increase tree cover, soil fertility, provide fodder and small biomass for energy needs. Further,

re-afforestation through planting of indigenous or exotic species in abandoned fields in a plantation environment where practical.

- Promote forest enterprise development (based on stakeholder consultations to be further developed through the CFM process). These may include:
  - Beekeeping using improved hives.
  - Mushroom collection and processing.

This management action will be operationalized, and results measured as follows:

Specific Objectives	**Strategy**	**Actions**	**Responsible**	**Indicator**
1. Enter into partnership with clear roles and responsibilities with surrounding communities	Promote community forestry approach	Conduct CFM Steps 1-3	FD	Signed CFM recognition. Annual work plan reports from the CFMG
2. To protect, restore and replant forest cover in the fragmented forest areas of the National Forest	To Provide Forest extension services.	Training the communities in assisted natural regeneration Promotion of agroforestry and Woodlot establishment for communities surrounding the forest.	FD	Hectarage of forest in the fringe areas increased year on year.
3. To reduce carbon emissions from agric soils and dependency on inorganic fertilizer	Promote CSA through Agroforestry	Partnership with MoA and others in training communities in CSA and agroforestry. Establishment of agroforestry tree nursery species in Mambwe District nursery.	FD/ Agric/ CSO's/ community	Tonnage of GHG emissions in the forest reserve reduced by 15% by mid-year review.
4. To significantly reduce levels of tree cutting for wood energy.	Promotion of energy efficient Cook stoves and Alternative energy sources.	Training community members in construction of Permanent energy cook stoves. Provide incentives to people using the	FD/ DoE/ community	Volume of wood cut for energy reduced by 30% by mid-term review

Specific Objectives	Strategy	Actions	Responsible	Indicator
		improved cook stoves.		
5 Reduce Forest dependency by local communities.	Promoting diversificatio n of activities, particularly on-farm activities such as agroforestry and establishmen t of wood-lots, to create alternative Sources for forest products.	Involve local communities in woodlot establishment.	FD/ Adjacent communities	Number of people dependent on the forests reserve reduced by half at midterm review
6. To contribute towards meeting social, cultural and economic needs and improving the livelihoods of forest-adjacent communities.	Forest resource condition is improved through management actions emphasizing the use of Best practices.	Training forest-adjacent communities in sustainable forest enterprises, such as beekeeping, and other non-wood forest enterprises	FD/ NGOs	Forest enterprise activities developed and producing income.
7. To reduce carbon emissions from deforestation and forest degradation by ensuring community benefit from carbon credits.	Establish an incentive benefit sharing mechanism through the carbon trading scheme to be established by Government in Eastern province	Stake holder participatory awareness meetings (Traditional leaders, Government, NGOs and the community)	FD/NGOs	Tonnage of GHG sequestered increased thereby income shared to community is improved year on year.

6.4 Promoting Forest Based Enterprises

Based on the condition of the forest including plant species as well as information gathered during the socio-economic assessment and stakeholder consultation meetings, a number of enterprise opportunities were identified and described earlier. Therefore, through the proposed management actions where appropriate in the relevant zones, forest-based enterprises will be promoted within the context of the purpose of a National Forests as described in the Forests Act, 2015. These relate to utilisation of forest resources at national level in order to meet the social, cultural and economic needs of the nation whilst ensuring the protection of ecosystems, particularly the protection of land and water supplies of local strategic importance. These reflect the importance of the principles of sustainable forest management. Therefore, the following enterprise initiatives are highlighted for promotion through local stakeholder involvement:

Forest product/ enterprise	**Beekeeping**	**Wood biomass energy production**	**Nature based eco-tourism**
Market/ demand	High, local & urban (Mambwe)	Medium local, potential supply Mambwe.	Local & international demand
Product supply	Patches of flowering trees with suitable pollen fodder, water restricted to certain areas	Through agroforestry & forest restoration activities	Wildlife availability in the forest.
Potential entrepreneurs	Community groups plus individual beekeepers	Community groups plus individual households	Forest department/community groups/ individuals
Opportunities	Honey off-takers are available in the district as a ready market.	Planned forest restoration works including agroforestry in cropped areas, potential bamboo sites.	The area is already a Game Management Area and adjacent to a wider network of wildlife protected areas. A concession is already present in the NF.
Challenges	Investment in sufficient hives, need for honey bulking centre and water reticulation system investment. technical & business skills training	Seedlings, marketing	High initial capital to undertake the business.

Table 8 Promoting potential forest-based enterprises

6.5 Fire management strategy

Fire has a critical impact on the forest environment, the condition of the forest and the services that it provides. While fire is frequently naturally occurring in the dryland forests of Eastern Province, it has been used as a management tool technically by foresters as well as by communities for different socio-economic and cultural nee

ds. However, fire that occurs late in the year when the forest is dry causes the greatest harm to the health of the forest as well as the succession process influencing the future productivity, abundance of forest products and therefore its economic contribution locally and nationally. Further, forest fire is a key source of emissions of greenhouse gases (GHGs) in Eastern Province, that affects weather patterns, locally, regionally and globally. Therefore if managed correctly as a management tool, prescribed fire can reduce these emissions and impacts, safeguarding the forest resources, biodiversity while providing enhanced opportunities for local economic development.

Therefore a **fire management strategy and plan** is essential for the proper management of the forest incorporating elements of fire protection and fire suppression. Recognising the important role the forest plays in support to surrounding communities, the fire management strategy for the National Forest will be developed through stakeholder consultation and implementation participation with clear roles and responsibilities. The **fire protection strategy** should indicate: priority areas for protection – valuable and fire sensitive species, newly planted areas, enrichment planting, areas of fire sensitive natural regeneration, as well as high risk areas based on access, use and past frequency of fires. Based on the participatory assessment, protection measures such as: firebreaks – both internal and boundary should be planned, areas for prescribed (early) burning identified as appropriate. An action/ activity plan with roles, responsibilities and timings should be discussed and agreed with stakeholders.

The **Fire suppression strategy** details the response should a wild-fire start which threatens the forest area. This will detail the pre-planned procedures along with roles and responsibilities. It will include the following:

- **A fire detection system:** The process and procedures to report the incidence of fire to promote prompt reaction and therefore protection.

- **Procedures in response to a fire alert:** How to alert stakeholders and local community members to assist with fire suppression including the availability and location of equipment to fight the fire.

- **Fire fighting strategy:** This will include details of various approaches to tackling fires using the materials and equipment that are available locally.

- **Methods to fight fires:** This will cover different fire suppression methods depending on the nature of the fire (Frontal attack, Flank attack, Indirect

attack – back burning). These will have been explained and key personnel trained in each of the approaches. This will also include risk assessment methods and requirements for personal protective equipment.

A **Fire Education Strategy** will be developed at the start of the implementation of the FMP: This aims to raise awareness of the community on the impact of fire and the need to protect the forest from fire. Groups which represent a higher risk should be targeted for education, eg, honey collectors, charcoal burners, mice collectors, schoolchildren etc.

6.6 Law enforcement Strategy

This Law Enforcement Strategy aims to protect and sustainably manage Machinje Hills National Forest; P 230, through effective enforcement of legal provisions, regulations, and community participation. Ensuring compliance is essential to prevent illegal activities such as illegal logging, poaching, and forest encroachment.

Objectives

- To prevent illegal exploitation of forest resources.
- To promote community participation in enforcement.
- To ensure timely and fair response to violations.

Key Enforcement Strategies:

Regulation of Forest Activities

- Designating zones and issuing permits and licenses for activities like harvesting, collection, and tourism.
- Enforcing restrictions on cutting, hunting, or collecting forest products outside authorized zones.

Monitoring and Surveillance

- Regular patrols by forest rangers and enforcement officers.
- Using technology such as drones, and GPS tracking.
- Engaging Honorary Forest Officers in reporting illegal activities.

Community Involvement in Law Enforcement

- Strengthening community forest groups' role in patrols and reporting.
- Providing incentives for communities that actively participate in enforcement.
- Publicizing penalties to serve as deterrents.

Collaboration with Stakeholders

- Coordinating with police, community groups, NGOs, and traditional leaders.
- Promoting joint patrols and awareness campaigns.

6.7 Environmental and social safeguards and other crosscutting issues

The Forestry Department shall ensure that the management of Machinje Hills National Forest is carried out in accordance with the Environmental and Social Standards (ESSs) in relation to national policies as well as international standards and agreements, both multilateral and bilateral as appropriate. Existing requirements are set out in the National Strategy to Reduce Deforestation and Forest Degradation, 2016 as well as new requirements that may come into force through the Eastern Province Jurisdictional Sustainable Landscapes Programme. In implementing the indicated management actions, these safeguards and other cross cutting issues will be mainstreamed in all aspects of forest management. In view of the participatory approaches applied in the development of the FMP and follow-up actions to promote community forestry it is expected that this FMP will have a positive impact upon local livelihoods and to provide support for the development of more sustainable or alternative livelihoods, where needed.

In brief, safeguards will ensure:

- Gender equity and empowerment including addressing issues of gender-based violence. Women shall be integrated into all aspects of management of the National Forest and empowered through equal participation in decision making, governance and benefit sharing. Gender equity shall be pursued to ensure that both men and women have the full range of opportunities and benefits arising from the management of Machinje Hills National Forest. This aspect should be in line with the National Gender Policy and Climate Change Gender Action Plan. Further safeguards in relation to emissions reductions benefit sharing plan for Eastern Province should be adhered to.
- Environmental and social screening processes. Specific activities as well as the annual work plan and operational plans should include a process of social and environmental screening. These should be reviewed and updated in accordance with the type of activity being planned and general screening reviewed annually.
- A Grievance redress mechanism will be operational at the District and Provincial level to allow a mechanism for grievances to be raised, documented and addressed. Documentation and tracking is core to this issue.

Specific Objectives	Strategy	Activity	Responsible	Indicator
To ensure cross cutting issues are mainstreamed in all aspects of forest management for social equity wellbeing and empowerment through sustainable development	Ensure that all environmental and social impacts, risks and liabilities are identified and mitigated. Identify training needs. Promote ownership and access to forest products and services.	Awareness raising Short courses Exchange visits Refresher courses	FD/NGOs	All crosscutting issues mainstreamed in all forest management aspects. Zero grievances raised. Grievances addressed and closed within 3 months

Infrastructure Development

In order to achieve the forest management objectives for Machinje Hills National Forest, maintenance of road infrastructure is required. However, upgrading or maintenance of roads may encourage illegal access and use.

No	Specific Objectives	Strategy	Actions	Responsibility	Indicators
1	To maintain the infrastructure necessary to achieve the multiple objectives of forest management.	Maintain the existing infrastructure	Maintain the road network.	FD/Maintenance / Infrastructure	All infrastructure maintained to optimum standards

6.8 Source of revenues

Sources of revenue in Machinje Hills National Forest typically is from the forest's resources, outlined below;

Licenses and Permits

- Issued by forest authorities (e.g., Forestry Department unless transferred under a CFM Agreement) for:
    - Timber / fuelwood harvesting
    - NTFP collection
    - Carbon projects (REDD+)
    - Eco-Tourism and Recreation
    - Visitor fees, concessions, or partnerships with private operators.
    - Others as provided by the Forests Act, 2015 or relevant regulations.

Climate change emissions reduction trading

The Government of the Republic of Zambia has identified climate financing as a potential source of revenue to support climate change mitigation and adaptation activities to safeguard the natural environment and importantly the ecosystem services that society as a whole and specifically rural communities depend on for their livelihoods and wellbeing. In the Eastern Province, the Ministry of Green Economy and Environment is implementing the Jurisdictional Sustainable Landscape Programme (EP-JSLP). The Programme Development Objective (PDO) is "to promote greenhouse gas (GHG) emissions reduction or removals in the Eastern Province, while simultaneously improving rural livelihoods including forest and wildlife conservation and management. These emissions reductions are being measured, verified, traded and revenue distributed according to an agreed Benefit Sharing Plan. An estimate has been made of the potential revenue that might be generated through the GRZ emissions reduction trading under the JSLP benefit sharing mechanism. The GHG baseline inventory indicated that the major emissions in the Province are coming from forest land through degradation from forest fires.

Implementing improved forest management, conducting fire management and protecting the integrity of the forest areas including from forest loss, degradation and encroachment can be measured and monetised.

In the case of Machinje Hills National Forest and based on the intact forest area of 84% may generate emissions reduction of over 43,000 tonnes of carbon equivalent which may be monetised to generate around $130,000 or ZMW 3,255,000 annually. This may increase as prescriptions of forest restoration may result in increased carbon sequestration that can be measured and monetised.

6.9 Summary Budget of Forest Management Plan Implementation

Forestry Programme	**Cost in ZMW for 10 years**
1 Forest Conservation through Community Participation and Livelihood Development	4,458,479
2 Forest Protection, Restoration, Management and Conservation of Biodiversity	2,951,007
3. Support the development of viable forest-based enterprises.	1,419,372
Total cost of operations (ZMW)	**8,828,858**
Revenue forecast (ZMW)	**49,178,442**
Net surplus (ZMW)	**41,768955**

Table 9 Summary budget of Forest Management Plan Implementation by: Programme Cost (ZMW)

Budget breakdown is provided in Annex VII

7 STAKEHOLDERS ROLES AND RESPONSIBILITIES

All key stakeholders will be involved in the implementation of the Machinje National Forest Management Plan in line with the following roles and responsibilities:

a) Forestry Department

The Forestry Department (FD) have a key role to play in promoting sustainable forest management and shall inform all relevant government departments on the management plan and raise awareness on the programmes and activities. The Department shall facilitate the implementation of the FMP at District and local level with oversight from Provincial level.

b) Stakeholders Roles and Responsibilities

Effective implementation of the Machinje National Forest Management Plan (FMP) requires active participation and collaboration among all key stakeholders. Each stakeholder has specific roles and responsibilities to promote sustainable forest management, conservation, and community development.

c) District Forest Office (DFO)

The District Forest Office plays a pivotal role in on-the-ground forest management, enforcement, and community engagement. Its specific responsibilities include:

- **Conduct Regular Patrols:** Carrying out routine patrols within the Machinje National Forest to prevent illegal activities such as unauthorized logging, poaching, and encroachment.
- **Maintain Boundaries and Beacons:** Ensuring all forest boundaries and beacons are clearly marked, visible, and maintained to prevent boundary disputes and illegal incursions.
- **Monitor Forest Recovery and Growth:** Tracking Forest regeneration, health, and overall ecological status to inform management decisions and detect signs of degradation.
- **Develop and Implement Forest Fire Management Plans:** Establishing proactive fire prevention, detection, and suppression strategies, including community-based fire management initiatives.
- **Conduct Environmental Education (EE) Campaigns:** Raising awareness among local communities and stakeholders about sustainable forest use, conservation practices, and the importance of forest resources.

Train Communities in Sustainable Forest Management (SFM): Providing capacity-building programs, workshops, and technical assistance to community members and forest management groups.

Report and Document Activities: Preparing and submitting comprehensive reports on forest conditions, patrol outcomes, enforcement actions, and community engagement efforts to relevant authorities for oversight and planning.

d) Provincial Forest Office (PFO)

The Provincial Forest Office provides strategic oversight, governance, and support to ensure effective implementation of the Forest Management Plan. Its primary responsibilities include:

- **Monitoring and Evaluation:** Regularly assessing the implementation of the FMP at district and community levels using predefined performance indicators to measure progress and identify gaps.
- **Disbursement of Funds:** Managing financial resources allocated for forest management activities, community support programs, capacity-building, and infrastructure development.
- **Facilitation of Audits:** Overseeing and supporting the auditing process of District Forest Offices and community initiatives to ensure transparency, accountability, and proper use of resources.
- **Coordination and Support:** Offering technical guidance, resources, and capacity-building support to District Forest Offices, community groups, and other stakeholders involved in forest management.
- **Policy and legal framework:** Ensuring that the FMP aligns with national forestry policies and legal frameworks, particularly the Forests Act, 2015.
- **Stakeholder Engagement:** Facilitating communication and collaboration among government agencies, communities, NGOs, private sector partners, and other relevant entities.

e) Role of the Local Authorities

Local authorities are vital for integrating sustainable forest management into broader development initiatives at the district and community levels. Their responsibilities include:

- Incorporating the FMP into local development plans, ensuring that forest management considerations are mainstreamed into land use, infrastructure, and ecosystem planning.
- Facilitating alignment between forest management activities and other sectors such as agriculture, water, and health.
- Supporting the enforcement of forest laws and regulations within their jurisdictions.
- Promoting rural development projects that leverage forest resources to enhance community livelihoods and economic resilience.

f) Role of Traditional Authorities

Traditional leaders play an influential role based on customary authority, community trust, and cultural management systems. Their roles encompass:

- Providing mentorship and guidance to community members on sustainable resource use.
- Helping resolve conflicts related to forest access, use, and rights according to customary laws.
- Providing formal consent for community-based forest management processes, including recognition and signing of community forest management agreements with the Director of Forestry.

- Supervising the community forest management groups, ensuring their activities conform to customary norms and legal provisions.
- Overseeing access control, management of natural resources, and the conduct of community elections for forest management committees.
- Ensuring that enforcement of rules and resolutions reflects community values and customary laws.

g) Role of Communities

Communities are the primary custodians of the forest and hold the rights to sustainably manage and benefit from forest resources. Their responsibilities include:

- Controlling access to forest resources to prevent illegal activities and overexploitation.
- Actively participating in decision-making processes related to forest management.
- Implementing community-based sustainable forest practices as outlined in the management plan.
- Protecting the forest from illegal activities such as logging, poaching, and encroachment.
- Ensuring equitable sharing of benefits derived from forest resources, including income, employment, and social services.
- Reporting violations and participating in community-led enforcement efforts.
- Maintaining the community forest management groups and ensuring transparency and accountability in their operations.

h) Role of Honorary Forest Officers (HFOs)

Honorary Forest Officers are community members appointed based on peer nominations and official approval by the Minister. Their roles include:

- Facilitating community compliance with forest laws, bylaws, and resolutions.
- Supporting enforcement of sustainable harvesting and access regulations.
- Acting as mediators in conflict resolution within the community regarding forest use.
- Reporting infractions and assisting in investigations related to illegal activities.
- Collaborating with District Forest Officials to ensure harmonized enforcement efforts.

i) Role of Private Sector and Civil Society Organizations (CSOs)

Private sector entities and civil society organizations are crucial for fostering economic development and social empowerment through forests. Their roles include:

- Providing technical and financial services to support community enterprises, such as training, capacity building, and infrastructure development.
- Developing market linkages for forest-based products, ensuring fair trade and sustainable value chains.

- Promoting innovative approaches and investments that enhance forest conservation while generating income.
- Supporting additional services such as environmental education, capacity building, and advocacy for policy reforms.
- Facilitating the development of non-timber forest products (NTFP) enterprises, eco-tourism, and other sustainable livelihood opportunities.
- Monitoring social and environmental impacts of forest-based activities to ensure compliance with sustainability standards.

8 MONITORING AND EVALUATING IMPLEMENTATION

Monitoring and evaluation (M&E) of the management plan is essential since it provides a basis for observation, adjustment and improvement of the targeted activities and assessment of the achievements. The Forest Management Plan will be implemented by Forestry Department by involving local communities around the forest reserve. The Department will provide a forum for dialogue, consensus building, priority setting and balancing of the various interests involved. Monitoring and evaluation of this management plan will also be based on annual work plans that will be prepared for the National Forest which will operationalize the management actions described in Chapter 6.

8.1 Monitoring

To ensure that implementation of the management plan is on course, FD will facilitate monitoring of activities and programmes in coordination with partners, stakeholders and community representatives including the impact of the FMP on the wellbeing of the communities on the forest fringes. Implementation of the FMP will be monitored through a number of identifiable indicators as described in the management actions in Chapter 6. These will be subject to regular review during the plan period. Continuous monitoring during the implementation period will be maintained through preparation and submission of monthly, quarterly and annual progress reports.

8.2 Evaluation

The MNF implementation and impact will be evaluated at two points. Mid-term (5 years) and at end of term (10 years). Evaluation will involve analysis of both activities and impact generated to sustainable management of the forest and the fringe communities as this will generate evidence to inform the development, focus and implementation of future management plans. Evaluation carried out will assess progress in the implementation of planned activities and achievement of objectives. The evaluation report will also provide essential information to revise the management plan.

8.3 Monitoring Responsibilities

The Provincial Forestry Office will undertake monitoring and evaluation of the implementation of the plan. The District Forestry Office will be responsible for submitting annual plans of operations, as well as monthly, quarterly, and annual progress reports to the Provincial Forestry Office.

8.4 Strategic monitoring indicators

Strategic monitoring indicators provide a measure of assessing whether set targets are progressively being achieved as described in the management actions Chapter. The lead implementing agencies represented by the Forestry Department will undertake monitoring and evaluation of the implementation of the plan.

Programme	Indicator of Success	Means of Verification	Assumptions
Forest Protection	Reduced incidences of forest crimes Reported. Performance of the local communities and honorary forest officers.	Records and reports.	The Plan is successfully completed and implemented with Cooperation from community Members
Biodiversity Conservation	Increase in species biodiversity.	Surveys on biodiversity, records, photographs and reports.	The Plan is successfully implemented Good working relationship between stakeholders Availability of resources
Community Conservation and Livelihood development	-Number of people - trained and practicing sustainable forest enterprises. -No. of woodlots established -Number and types of IGAs. -Crop and livestock yield.	Records, reports and photographs. Community Visits.	The Plan is successfully implemented Availability of funds
Environmental Education	Number of school conservation clubs formed. No. of awareness meetings and attendance. -No of trainings held/exposure visits	Records, monitoring & Evaluation reports and photographs.	The plan is successfully implemented with funds made available.
Infrastructure Development	Number and type of infrastructure Developed/ maintained	Records Monitoring and evaluation reports	The Plan is successfully implemented Availability of funds
Human Resource Development	Number of people employed Number of people trained. Number of community members involved in forest activities	records Monitoring and evaluation report	The Plan is successfully implemented Availability of funds

Table 10: strategic monitoring indicators

9 ANNEXES

Annex 1: Declaration Order, Topo Map & Inventory Map

SECTIONS 5 AND 6-THE NATIONAL FOREST NO. P230:

MACHINJE NATIONAL FOREST (DECLARATION) ORDER

Order by the Minister

SECTIONS 5 AND 6-NATIONAL AND LOCAL FORESTS

Declarations by the Minister

NATIONAL AND LOCAL FORESTS NOS. 1, 6 AND 8

The areas described in the Schedule are hereby declared to be National and Local Forests, and the following acts are hereby prohibited within the said areas except under license: (a) felling, cutting, taking, working, burning, injuring or removal of any forest produce; (b) squatting, residing, building any hut or livestock enclosure, constructing or reopening any saw-pit or road; (c) firing any grass or undergrowth; (d) grazing livestock; (e) clearing, cultivating or breaking up land for cultivation or other purposes; (f) entering or being in or upon the said areas in any manner or for any purpose contrary to any statutory order made by the Chief Forest Officer: Provided that, notwithstanding the foregoing prohibitions, any bona fide picnic or camping party may without license camp and light fires in any portions of the said areas set apart for these purposes on condition that any fires so lighted shall be effectively prevented from spreading and shall be extinguished before being left by the person or persons who lighted them.

Statutory Instrument

NATIONAL FOREST NO. P230: MACHINJE HILLS

Statutory Instruments

50 of 1970

158 of 1975

Starting at the beacon on the south bank of the Lukuzye River opposite the foot of the Nyani Falls, the boundary follows the Lukuzye River in a south-easterly direction for a distance of 31,863.8 meters approximately to the beacon erected on the south bank of the river (beacon on a bearing of 35 degrees approximately and a distance of **3,057.18** meters approximately from the source of the Pasara Stream); thence in a southerly direction on a demarcated line on a bearing of 187 degrees approximately and a distance of 1,609.36 meters approximately to a beacon erected near the Mwandanka to Musumba path; thence in a westerly direction on a demarcated line on a bearing of 245 degrees approximately for a distance of 1,828.8 meters approximately to a beacon erected at the source of the Pasara Stream; thence down the Pasara Stream to its junction with the Mwatezi River; thence down the Mwatezi River for a distance of **16,093.44** meters approximately to a beacon erected on the west bank of that river source 152.4 meters approximately upstream of the junction of the Mwatezi River and the Kamuchele Stream, thence to a beacon on a

demarcated line on a bearing of 254 degrees approximately and a distance of **8,229.6** meters approximately; thence to a beacon on a demarcated line on a bearing of 241 degrees approximately and a distance of **12,131.04** meters approximately to the north bank of the Msandile River; thence following the north bank of this river in a north-westerly direction for a distance of **2,895.6** meters approximately to a beacon; thence to a beacon on a demarcated line on a bearing of 39 degrees approximately and a distance of **14,264.64** meters approximately; thence to a beacon on a demarcated line on a bearing of 53 degrees approximately and a distance of **36,271.2** meters approximately; thence to a beacon on a demarcated line on a bearing of 16 degrees approximately and a distance of **1,828.8** meters approximately to the point of starting. The area described above, in extent **72,963.363** hectares approximately, is shown bordered green on Plan No. FR298 deposited in the office of the Surveyor-General, signed by him and dated 15th November, 1968.

1. Map of Machinje Hills National Forest in green in relation to Chiefdom boundaries (1958 map)

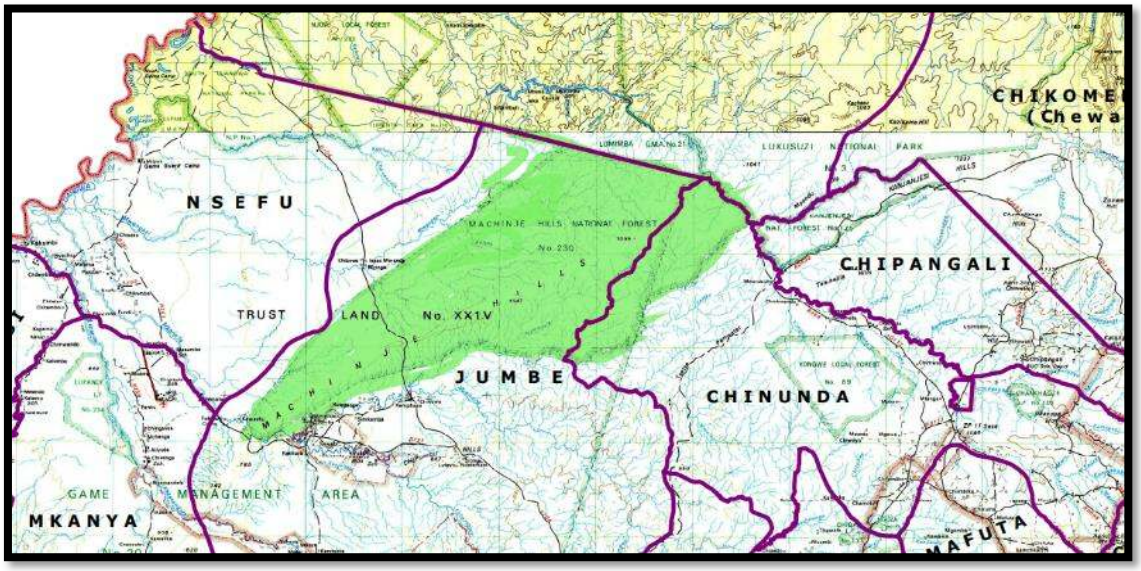


Figure 16: Map of Machinje Hills NF relating to forest condition

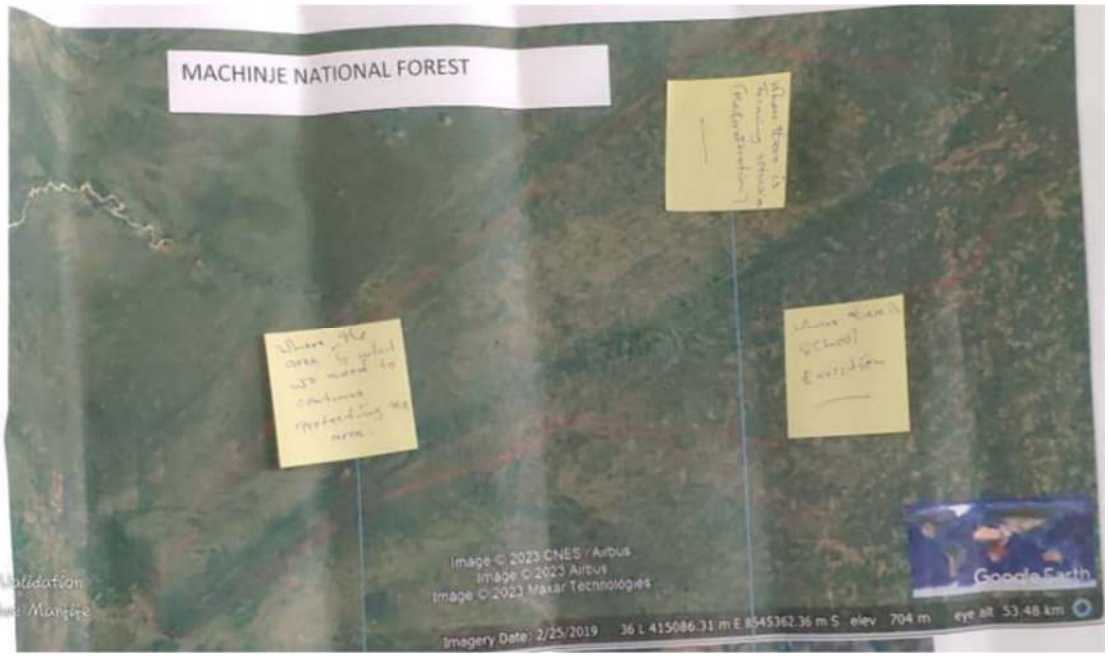
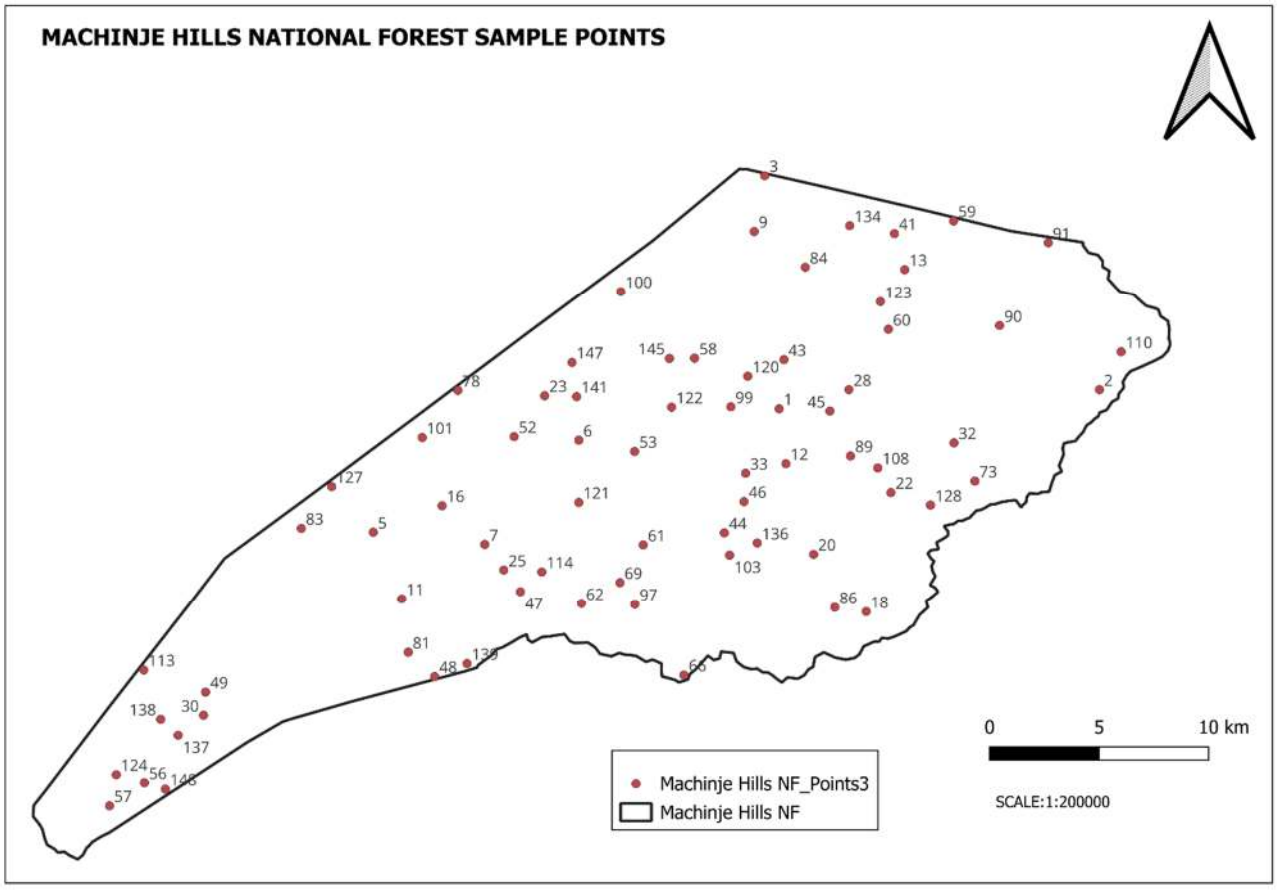


Figure 17: Map indicating systematic sample points within the inventory squares.



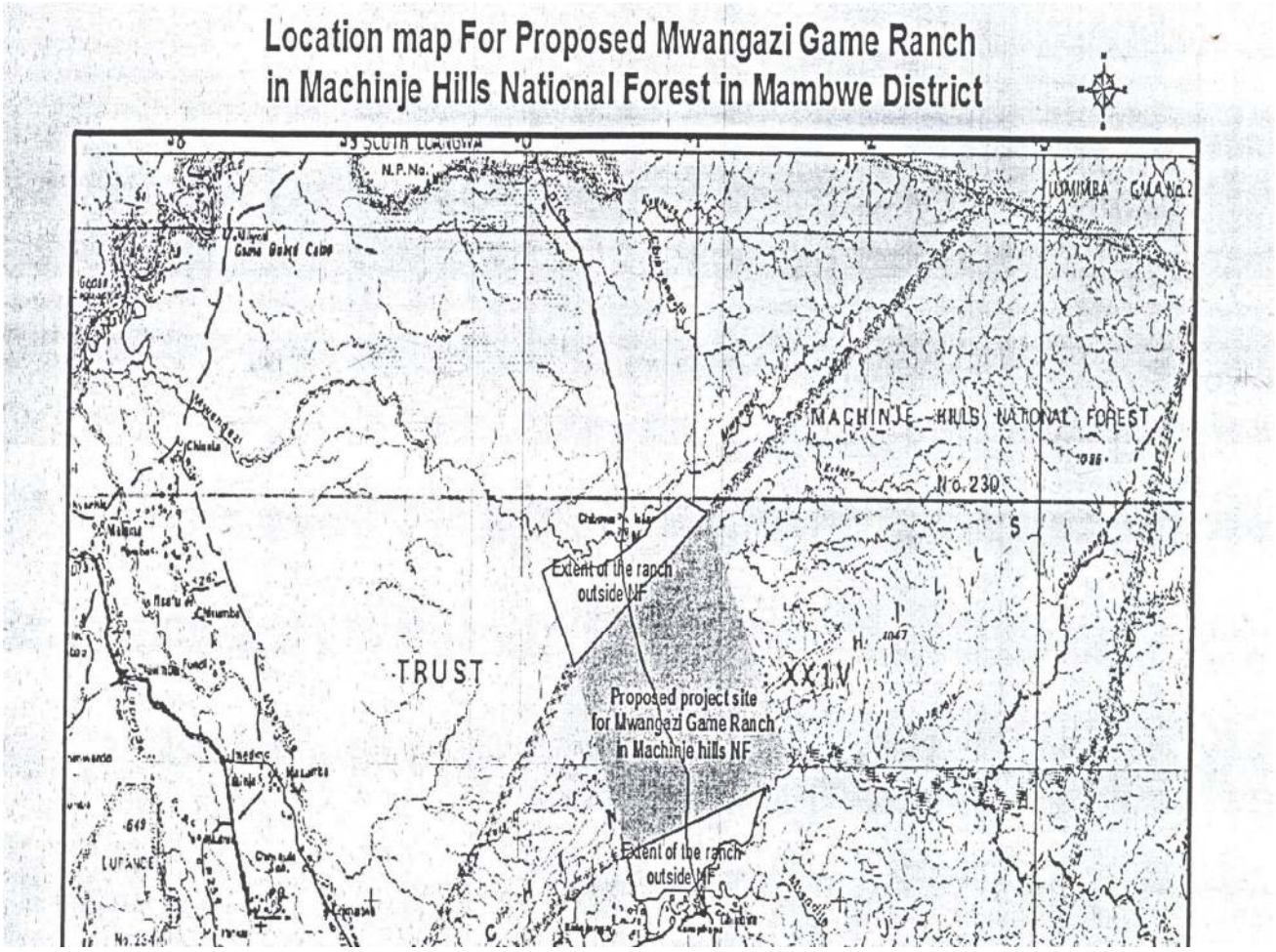


Figure 18 Portion of Machinje Hills NF under a lease agreement

Annex II: Inventory Data

Diameter Class	0-4	5-9	10-14	15-19	20-29	30-39	40+	Total
Vol (m^3)/ha	0	3.96	7.10	1.54	2.33	1.33	1.81	18.07
Bole Vol (m^3)/ha	0	1.37	2.53	0.57	0.69	0.43	0.59	6.17
Density/SPH	0	155.43	102.14	9.56	6.01	1.60	1.14	276.00
Basal area (m^2)/ha	0	0.70	1.14	0.21	0.29	0.14	0.19	2.67
Biomass, Total (Tons)/ha	0	6.11	10.89	2.33	3.59	2.37	3.31	28.60
Carbon, Total (Tons)/ha	0	3.06	5.44	1.17	1.80	1.19	1.66	14.30
Vol (m^3)/ha Sawlogs	0	0.00	0.00	0.01	0.00	0.56	1.04	1.61
Vol (m^3)/ha Poles	0	1.74	3.41	0.71	0.83	0.23	0.71	7.64
Vol (m^3)/ha Fruits	0	0.26	0.49	0.01	0.13	0.04	0.00	0.93
Vol (m^3)/ha Medicinal	0	0.87	1.17	0.33	0.71	0.01	0.04	3.16
Vol (m^3)/ha Firewood	0	0.07	0.14	0.01	0.03	0.00	0.00	0.27
Vol (m^3)/ha Others	0	1.00	1.87	0.46	0.63	0.46	0.00	4.41
Seedlings								2,257

Annex III: Demographics of major forest fringe communities

Demographics of major forest fringe communities

Locality name	sex of household head		Total
	Female	Male	
Agriculture camp	0	1	1
Chaumbwa	10	19	29
Chenja	10	25	35
Chikatu	2	2	4
Chilepa	6	8	14
Chimbalu	2	7	9
Chingondo	2	4	6
Chipeni	9	11	20
Chipenu	0	1	1
Chishemere	2	4	6
Daglas farm	0	7	7
Delifa	2	2	4
Ebeneza	1	2	3
F.T.C	0	3	3
Jaulani	4	3	7
Jumbe	16	32	48
Jumbe old stores	10	12	22
Jumbe Primary	0	4	4
Kabacho	7	9	16
Kamfumu	8	10	18
Kamoto	10	18	28
Kanguwo	1	6	7
Katabila	5	6	11
Kaunje	1	3	4
Koloko	3	3	6
Machelenga	2	4	6
Malama	11	24	35
Malizani	2	6	8
Momba	2	2	4
Mphata wildlife camp	1	2	3
Mutoba	3	7	10
Mzinyonge	7	13	20
Old stores	0	2	2
Phiri workshop	0	2	2
Saidi	4	14	18
Sakwa farm	1	1	2
Shulani	2	1	3
Thedi	1	1	2
Whyson Banda	0	1	1
Total	**147**	**282**	**429**

Annex IV: Stakeholder consultations

The Forestry Department in Eastern Province initiated a process to prepare forest management plans for 24 forest reserves with support from Zambia Integrated Forest Landscape Project (ZIFLP). In accordance with section 41 of the Forests Act, 2015, a process of engagement with traditional leaders was conducted in order to gain support from the Chiefs in the preparation of the Forest Management plans before the proposed data collection activities and later local validation meetings. It was planned to meet their Royal Highnesses to gain consent and have an input in these Forest Management Plans.

Therefore, the Chiefs under which Machinje National Forest reserves fall were targeted with the following objectives.

- To provide a platform of getting the views of the concerned Chiefs, in relation to the respective developed forest management plans for forest reserves in their Chiefdoms.
- To collect and incorporate the agreed views from the Chiefs in the message pack for the local validation meeting.

Visitations to Chiefs on FMP consultations

During the courtesy call the team gave the background of forest inventories conducted in Machinje NF reserve and the interventions that ZIFLP is helping, the importance of the Luangwa landscape and the areas of interventions including climate smart agriculture, support to Forestry Department to continue protecting existing forest estates, support to nurseries, assisted natural regeneration and also support to establishment and management of community forests. The specifics of the visit were also made clear as to have an input from the Royal Highnesses in the development of the forest management plans.

Meeting Chief Chinunda, Chief Jumbe and Senior Chief Nsefu on Machinje NF

Forest Management plan to be written effectively, his Royal Highnesses Chief Chinunda and Chief Jumbe was visited for consultation over Machinje Hills National Forest of Chipangali and Mambwe Districts.

OBJECTIVES

- To get views from Royal Highnesses and incorporate those views in the development of forest Management plans.
- To engage local authorities, local communities and other stakeholders to give their valuable input in the management plan.

Annex V: Stakeholder validation meeting

REPORT FOR THE MANAGEMENT PLAN STAKEHOLDERS' VALIDATION MEETING HELD AT COUNCIL HALL IN MAMBWE DISTRICT

1.0 Introduction

The Forestry Department in 2021 undertook a forest inventory exercise to take stock of the forest resources in Machinje NF (MNF) among others with the view of collecting data to inform the preparation of Forest Management Plans (FMPs). The FMPs are prepared to guide the community-government partnership in the management of protected forest areas (FPAs) in the Eastern Province. Following the forest inventory exercise, draft FMPs were prepared for all the FPAs in Eastern Province. The Stakeholders Validation Meeting for MNF in Machinje NF was organized to validate the FMP for the MNF which was developed by the Forestry Department.

The meeting brought together 37 participants: (7 females and 30 males) drawn from government departments, civic leaders, CSOs, private sector, community groups and traditional leaders.

2.0 Official Closing

Mr. Tembo the Ag/ District Commissioner for Chipangali officiated at the MNF FMP validation meeting. The Ag/District Commissioner informed the participants that the formulation of Forestry Management Plans (FMPs) was required by law (Forestry Act No. 4 of 2015) to be validated by stakeholders as it has been done today. Hence the meeting was very important. The meeting was called to facilitate sustainable management of the MNF which has no current FMP. In this regard the Ag/District Commissioner implored the stakeholders for constructively engaging and contributing actively in the meeting. The Ag/District commissioner reiterated that FMP formulation is a legal obligation and needed to be formulated and validated in a consultative and participatory way the way we have done.

4.0 Meeting Objectives

As the meeting objectives were highlighted by the DC's in their speech.

5.0 Structure of Meeting

The meeting had three main components, presentations, group work and plenary discussions.

5.1 Presentations

Three main context setting presentations were made by the workshop facilitators:

i) Policy and legal context;
ii) Natural Resources profiles; and
iii) Socio-economic profile

5.1.1 Policy and Legal Context

The presentation on Policy and legal context was done by Mr. Christopher Gondwe, Community Forest Technical Advisor, ZIFLP. The presentation covered the roles and functions of protected forest areas (PFAs); and why they are established. To enhance comprehension of the information in the presentation imagery was also used. Also highlighted in the presentation was a brief overview of the Zambia Integrated Forest Landscape Project (ZIFLP) and its significance in the sustainable forest management. The major highlights from the presentation were:

The imagery showing the negative effects of major on-going deforestation, rapid deforestation for farming and unsustainable livelihood activities.

- The objectives of ZIFLP that is "To improve the landscape management and increase environmental and economic benefits for the targeted rural communities in the Eastern Province" was highlighted;
- The ZIFLP as a GRZ project provided the Forestry Department with resources to enable it to fulfil its mandate and functions;
- Also highlighted in the presentation were the reasons that prompted government to implement the ZIFLP in Eastern Province which include the following on-going degradation, deforestation, unsustainable livelihood activities, low crop yields, increased adverse effects of climate change, and low community participation in forest management:
- The importance of forests in line with the legal framework were highlighted in the presentation such as soil conservation, carbon sequestration, water cycle and habitat protection;
- The ZIFLP was a REDD+ Project, to determine where Green House Gases (GHG) were being emitted and the sources of these emission, Green House Gases (GHG) baseline survey was conducted which revealed 3 main sources of GHG emissions in Zambia: degradation 46%, forestry loss to agriculture 16% and emissions from agriculture soils at 14 %. The underlying causes of the 3 main source of GHG emissions were also highlighted;
- Through ZIFLP government was not only intervening to arrest the situation but also to make the communities aware of the imminent consequences if no action was taken at national and subnational levels;

- An overview of selected of existing pieces of Forest legislation were shared such as the National Forest Policy 2014, National Strategy to Reduce Deforestation and Forest Degradation, National Forestry Act No 4 of 2015 among others. Contents such as vision, objectives and measures were also shared;
- Also presented were the policy and pieces of legal documents pertaining to MNF. It was highlighted that MNF was gazetted as a forest in 1968 a local supply of timber. Forest protection was important for both the present and future generation as provided for in the legal documents;
- The meeting was being held because sustainable forest protection and management required concerted efforts and that FMPs formulation was a legal obligation that needed to be done in a consultative and participatory manner;

Situation Analysis

The presentation on situation analysis focused on the two surveys- Natural Resources Profiles and the other on the socio-economic profile, that were undertaken in the national forests 2021 and the results.

a) Natural Resources Profiles- Forestry Inventory Results including Change Analysis

Mr. Christopher Gondwe presented the situation analysis highlighting the natural resources profiles and inventory results and change analysis. Major highlights from the presentation included:

- Total number Protected Forest Reserves in eastern province was 73: 11 NFs and 62 LFs covering 469,142 ha which translates to 9.2% of the total surface area of the eastern province. the total boundary area covers 2,042.7 km;
- MNF was gazetted in 1968 with total hectarage of 72963.36.
- How volume was calculated/measured was demonstrated
- The sampling design used to select the sample plots in the survey was systematic sampling design through which sample plots were created and data was accordingly collected from all the sample plots.
- Parameters that were considered in the survey were highlighted and explained.
- The proposed programmes as contained in the draft FMP for MNF were also presented.

b) Social-Economic Profile.

Mr Mully Phiri from Zambia Statistics Agency made the presentation on Social-Economic Profile. Noteworthy highlights from the presentation included the following:

- The province undertook the Socio-Economic Survey in LDLF in 2021 alongside the Forest Inventory.
- At the time of the survey, the total population for the 39 villages surrounding MNF included in the survey that derived benefits from the forest was 1,934 out of which 939 were male and 995 were female. The sample comprised 429

households, out of which 282 were male headed households and 147 were female headed households;

- Farming (76.2) was the main source of livelihood for the people surrounding the Forest, while (15.0%) are in paid employment and (8.8%) in business as main income generating activities.
- Almost (96.3%) all the people sampled Majority depended on firewood for cooking while only 3.7 use charcoal.
- Traditional housing units comprise of 20.0 % of the population living in this type of housing units, while 46.2 are in improved traditional housing units, 33.8 are detached housing units.
- River/streams in MNF was the main source of water for the sampled population at 47.5, followed by protected Well at 20.0, borehole was at 18.8 %, unprotected at 2.5%
- As much as 90% of the total sample population expressed willingness to protect and manage the MNF and only 10% expressed lack of willingness;

4.2 Group Work

Group work on issues and threats affecting the Protected Forest Area (PFA) and identification of hot sports of concern was facilitated by Mr. Anton. Two groups were formed to: -

- Identify issues and suggest possible solutions;
- Identify priorities and strategies;
- Identify uses of the forest and map where they were most prevalent
- The FPA and identification of practices which should be allowed or not allowed in the respective areas
- Who should be involved in the management of MNF

4.2.1 Group Presentations

The Groups made presentations to facilitate agreement of the strategies and partnership for management.

5.0 Collaboration Declaration Pledge

The stakeholders signed a joint declaration pledging to collaborate in the sustainable management of LNF. Below are the contents of the Declaration Pledge:

"We the interested stakeholders of MNF agree the need to increase the productivity of the MNF to enhance the environmental, social, cultural and economic values.

Damaging activities were identified, and solutions and strategies put forward to ensure the forest is well managed and protected. Permitted practices were identified as well as those which should be controlled.

As concerned stakeholders we are ready to work in partnership with the Forestry Department, Local Authority, traditional leaders to collaborate over the protection, control, use and management of MNF".

6.0 Next steps

The team facilitated the session on next steps. Below were the agreed next steps/ way forward

- Forestry Department team to capture discussions, issues, strategies, and recommendations from the meeting and report the opportunities to the Provincial Forestry Office and the Forestry Department Headquarters
- The chiefs' representative should report to their Royal Highnesses the proceedings of the meeting
- Forestry Department Team to:
    - Support follow up activities
    - Develop proposal to secure funding for development of MNF with stakeholders' involvement
    - Subject to Project extension, check for opportunities for supporting enterprise development

7.0 Vote of thanks, Closing Remark and Prayer

A representative of the stakeholders thanked government for convening that important meeting but appealed to government to implement the recommendations.

Mr Gondwe thanked everyone for attending the meeting and contributing through their inputs in perfecting the FMP. He implored the stakeholders to report back to their superiors and/or their communities. The closing prayer was done by one of the stakeholders.

The following is a synopsis of the group work and write up from flipcharts and other materials:

GROUP WORK - 1

1. Identify in Machinje National Forest

ISSUES	**Solutions/opportunities**
Rapid Deforestation	Reforestation
Late burning	Sensitization on late burning
Illegal settlements	Eviction
Lose of forest land to agriculture activities	No expansion of farm land
Illegal allocation of land by community leaders	Awareness to the local leaders on the illegalities

2. Forest

Permitted practices.

- Grass harvesting
- Hunting routes
- Caterpillars
- Dry firewood
- Fruits
- Early burning
- Honey

Prohibited practices.

- No Charcoal Production
- No fresh Timber cutting
- No Late fires
- No poaching
- Illegal allocation of land
- Illegal construction of infrastructure

List Suggestions/strategies to improve productivity/management of the forest.

- What should be the priority?
- Sensitization meeting – Chiefs, Traditional Leaders and Communities
- Reforestation on deforested areas
- Recruitment of honorary rangers.
- Who should be involved?
  - Government Departments – Forestry, Agriculture, Dept. of National Parks, NGOs, Traditional Leaders, Communities inside and around the forest.
- How do we work together?
  - Stake holders' engagement meetings
  - Formation of committees, involving communities' leaders, government departments, NGOs etc

GROUP 2

3. Identify in Machinje Hills National Forest

What- Uses of the forest

- Medicine
- Firewood
- Hunting
- Fruits collection
- Poles
- Timber
- Charcoal

Who- Users of the forest?

- Local Community
- Outsiders

4. List suggestions/strategies to improve productivity/management of the forest.

    - What should be the priority?
        - Approach the chief and discuss on forest degradation of the forest.
        - Intensify By laws at community level.
        - Sensitisation of the communities
        - Replanting of trees to degraded areas.

    - Who should be involved?
        - Traditional Leaders
        - Local Communities
        - Technical groups (stakeholders)
    - How do we work together?
        - Formation of Community Forestry Groups (CFMGs)

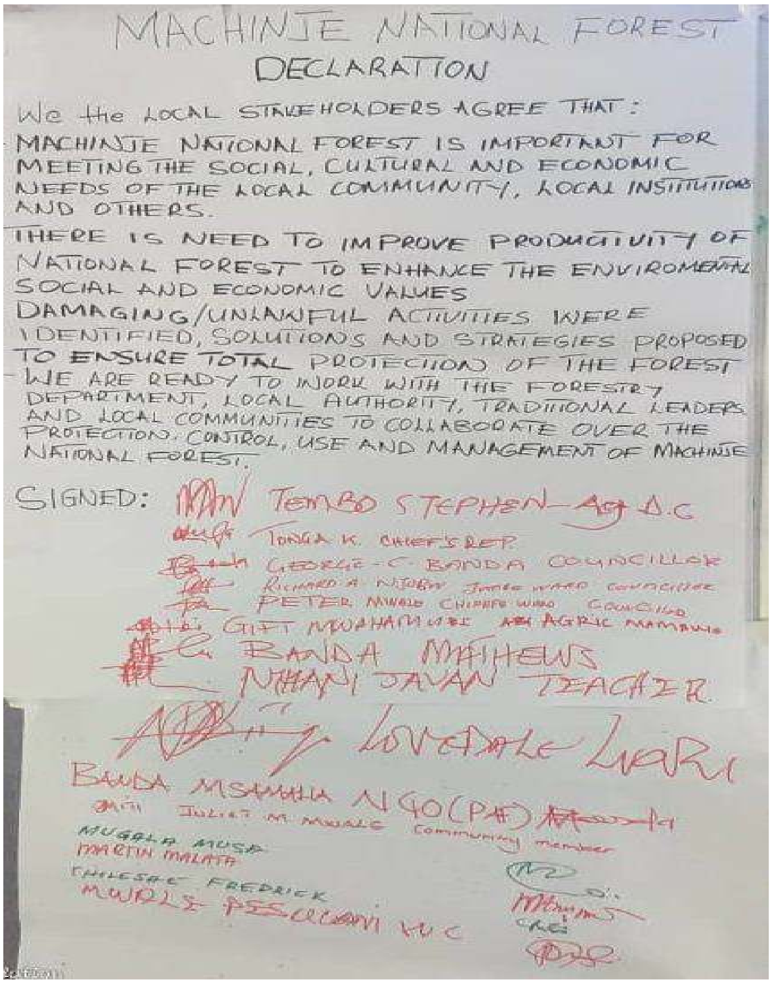
NEXT STEPS

- Compilation of the report
- Reporting to the chief and the Community
- Community forest processes
- FD to help Community forestry processes.

Declaration

The stakeholders meeting for Machinje National Forest that was held on 23rd December 2023, at Mambwe Council Hall, in Mambwe district. The stakeholders signed a joint declaration pledging to collaborate in the sustainable management of Machinje National Forest.

The contents of the declaration Pledge prepared and signed by stakeholders is displayed.



MACHINJE NATIONAL FOREST
DECLARATION

We the LOCAL STAKEHOLDERS AGREE THAT:

- MACHINJE NATIONAL FOREST IS IMPORTANT FOR MEETING THE SOCIAL, CULTURAL AND ECONOMIC NEEDS OF THE LOCAL COMMUNITY, LOCAL INSTITUTIONS AND OTHERS.
- THERE IS NEED TO IMPROVE PRODUCTIVITY OF NATIONAL FOREST TO ENHANCE THE ENVIROMENTAL SOCIAL AND ECONOMIC VALUES
- DAMAGING/UNLAWFUL ACTIVITIES WERE IDENTIFIED, SOLUTIONS AND STRATEGIES PROPOSED TO ENSURE TOTAL PROTECTION OF THE FOREST
- WE ARE READY TO WORK WITH THE FORESTRY DEPARTMENT, LOCAL AUTHORITY, TRADITIONAL LEADERS AND LOCAL COMMUNITIES TO COLLABORATE OVER THE PROTECTION, CONTROL, USE AND MANAGEMENT OF MACHINJE NATIONAL FOREST.

SIGNED: TEMBO STEPHEN Ag D.C
TONGA K. CHIEF'S REP
GEORGE C. BANDA COUNCILLOR
PETER MWALE CHIPAPA WARD COUNCILLOR
BANDA MATHEWS
NKHANI JAVAN TEACHER
LOVEDALE LUNGU
BANDA MSAMALA NGO (PAF)
JULIET M. MWALE Community member
MUGALA MUSA
MARTIN MALATA
CHILESHE FREDRICK

Annex VI: References

References that were used in the collection of information for this Forest Management Plan included the following:

- Fanshawe D.B (1971), The Vegetation of Zambia, Forest Research Bulletin No. 7 Ministry of Rural Development, Republic of Zambia, Government Printer, Lusaka, Zambia
- Government of Zambia, (2018) The National Guidelines for Community Forestry in Zambia, Forestry Department, Lusaka, Zambia. https://ziflp.org.zm/cfm/
- Hollingworth, L.T D. Johnson, G. Sikaundi, S. Siame, (2015) Fire Management Assessment of Eastern Province, Zambia. Washington. DC: USDA Forest Service.
- ILUA II (2006) Integrated Land Use Assessment Phase 1- Field Manual.
- The Food and Agriculture Organization of the United Nations and the Forestry Department, Ministry of Lands and Natural resources, Lusaka, Zambia
- ILUA II (2008) Integrated Land Use Assessment Phase 1- Report for Zambia.
- The Food and Agriculture Organization of the United Nations and the Forestry Department, Ministry of Lands and Natural resources, Lusaka, Zambia
- ILUA II (2014) Forest Biophysical Field Data Entry Booklet; Forestry Department, Ministry of Lands and Natural Resources, Lusaka, Zambia
- ILUA II (2016) Integrated Land Use Assessment Phase II- Report for Zambia.
- The Food and Agriculture Organization of the United Nations and the Forestry Department, Ministry of Lands and Natural resources, Lusaka, Zambia
- ILUA II (2016) Integrated Land Use Assessment Phase II- Technical Report for Eastern Province.

Annex VII: Budget for Implementing Forest Management Actions

The various prescribed activities are outlined and their corresponding costs are indicated along with revenue forecast

Action 1: Forest Protection, Management & Conservation of Biodiv																
		Unit of Measure	Quantity	Frequency	Unit Cost	Total Cost Year 1	Total Cost Year 2	Total Cost Year 3	Total Cost Year 4	Total Cost Year 5	Total Cost Year 6	Total Cost Year 7	Total Cost Year 8	Total Cost Year 9	Total Cost Year 10	Total cost
1. To develop a shared management approach to forest protection, management and utilisation.	1. Stakeholder engagement,	Community meetings	2	2	5,000	20,000				29,282	-	-	-	-	-	49,282
	2.community awareness raising and mobilisation;	Community meetings	1	2	7,000	14,000				20,497	-	-	-	-	-	34,497
	2. Stakeholder mapping including forest use, users and geographic interest.	Community meetings	2	1	6,000	12,000									-	12,000
	3. Forming community level institutions to coordinate, manage and control local resource use in partnership with the Forestry Department.	Community meetings	1	1	5,000	5,000										5,000
	4. Developing forest product and issues based operational management plans for areas of interest.	Community meetings	2	2	5,000	20,000				29,282					47,159	96,441
	5. Agreeing roles, rights, responsibilities and obligations for shared management.	Community meetings	1	1	5,000	5,000		-	-	-	-	-	-	-	-	5,000
	6. Conduct training in control functions: Permits, rules, financial management, law enforcement	Community meetings	1	2	6,000	12,000				17,569						29,569
	7. Conducting joint monitoring and evaluation of management and benefit sharing measures to ensure a sustainable partnership.	Community meetings	1	10	6,000	60,000	66,000	72,600	79,860	87,846	96,631	106,294	116,923	128,615	141,477	956,245
2. To protect the Forest from late fires	Practice early burning within and outside the forest by involving local communities.	72,961ha	1	10	4000	40,000	44,000	48,400	53,240	58,564	64,420	70,862	77,949	85,744	94,318	**637,497**
3. To secure the boundary and define the extent of the boundary and prevent possible encroachment	1. Carry out annual Boundary maintenance.	137KM	1	1	80,000	80,000	88,000	96,800	106,480	117,128	128,841	141,725	155,897	171,487	188,636	**1,274,994**
	2. Beacon maintenance	No.	30	2	800	48,000				70,277					113,181	**231,458**
	3. Erection of sign posts	No.	15	1	300	4,500										**4,500**
To conserve and enhance the biodiversity of the forest reserve through	Enhance understanding of the forest ecosystem and its function and benefits to community groups and schools.	School visits	4	10	300	12,000	13,200	14,520	15,972	17,569	19,326	21,259	23,385	25,723	28,295	**191,249**
To significantly reduce levels of illegal forest product	Engage honorary forest Officers/guards	coord meetings	1	10	2,000	20,000	22,000	24,200	26,620	29,282	32,210	35,431	38,974	42,872	47,159	**318,748**
	Conduct patrols	No	1	48	800	38,400	42,240	46,464	51,110	56,221	61,844	68,028	74,831	82,314	90,545	**611,997**
SUB-TOTAL						**390,900**	**275,440**	**302,984**	**333,282**	**533,518**	**403,272**	**443,599**	**487,959**	**536,755**	**750,771**	**4,458,479**

Action 2: Forest Restoration through Community Participation & Livelihood Development																
1. Enter into partnership with clear roles and	Promote community forestry approach / restoration planning	Community meetings	3	3	3,000	27,000		29,700		-	-	32,670		-	-	89,370
2. To protect, restore and replant forest cover in the	Support forest restoration activities	Community meetings	3	3	3,000	27,000	29,700	32,670	35,937	39,531	43,484	47,832	52,615	57,877	63,665	430,310
3. To reduce carbon emissions from agric soils	Promote CSA through Agroforestry	CSA ha	25	1	650	16,250	17,875	19,663	21,629	23,792	26,171	28,788	31,667	34,833	38,317	258,983
4. To significantly reduce levels of tree cutting for	Promotion of energy efficient Cook stoves	Training	1	2	5,000	10,000				14,641						24,641
	Roll out programme	stoves	200	2	100	40,000	44,000	48,400	53,240	58,564	64,420	70,862	77,949	85,744	94,318	637,497
5 Reduce forest dependency by local communities.	Sources for forest products/ woodlots/ plantations	woodlot establishment(Ha)	1	10	5,000	50,000	55,000	60,500	66,550	73,205	80,526	88,578	97,436	107,179	117,897	796,871
6. To contribute towards meeting social, cultural and economic needs and	Forest enterprises promoted & supported	Enterprise groups formed & trained	4	1	2,750	11,000	12,100	13,310	14,641	16,105	17,716	19,487	21,436	23,579	25,937	175,312
		Equipment	3	1	30,000	90,000		99,000				108,900		-	-	297,900
7. To reduce carbon emissions from deforestation and forest	Access to an incentive benefit sharing mechanism through the carbon trading scheme to be established by Government in Eastern province	Community meetings	3	1	3,000	9,000		9,900		10,890		11,979		13,177		54,946
																-
8. To ensure cross cutting issues are mainstreamed in all aspects of forest management for social equity wellbeing and empowerment through sustainable development	1 .Ensure that all environmental and social impacts, risks and liabilities are identified and mitigated.	Community meetings	3	1	5,000	15,000		16,500		18,150		19,965		21,962		91,577
	2. Identify training needs.	Community meetings	3	1	2,500	7,500		8,250		9,075		9,983		10,981		45,788
	3. Monitoring safeguards & Grievances	Community meetings	1	1	3,000	3,000	3,300	3,630	3,993	4,392	4,832	5,315	5,846	6,431	7,074	47,812
9. To maintain the infrastructure necessary to achieve the multiple	Maintain the existing infrastructure	Site specific				-	-	-	-	-	-	-	-	-	-	-
SUB-TOTAL						**305,750**	**161,975**	**341,523**	**195,990**	**268,345**	**237,148**	**444,359**	**286,949**	**361,763**	**347,208**	**2,951,007**
10. Support the development of viable forest based enterprises	1. Beekeeping	Equipment	1000	1	750	750,000										750,000
		Training	1	2	2,500	5,000	5,500	6,050	6,655	7,321	8,053	8,858	9,744	10,718	11,790	79,687
	2. Wood biomass energy production	Training	1	2	2,500	5,000	5,500	6,050	6,655	7,321	8,053	8,858	9,744	10,718	11,790	79,687
	3. Wild fruit harvesting	Training	1	4	2,500	10,000	11,000	12,100	13,310	14,641	16,105	17,716	19,487	21,436	23,579	159,374
	4. Eco-Tourism and Recreation	Training	1	4	3000	12000	13,200	14,520	15,972	17,569	19,326	21,259	23,385	25,723	28,295	191,249
		Monitoring	1	4	2,500	10,000	11,000	12,100	13,310	14,641	16,105	17,716	19,487	21,436	23,579	159,374
														Enterprise Sub total		**1,419,372**
												Grand total costs for the period of the Plan (ZMW)				**8,828,858**
		Unit of Measure	**Quantity**	**Frequency**	**Unit revenue**	**Total Revenue Year 1**	**Total Revenue Year 2**	**Total Revenue Year 3**	**Total Revenue Year 4**	**Total Revenue Year 5**	**Total Revenue Year 6**	**Total Revenue Year 7**	**Total Revenue Year 8**	**Total Revenue Year 9**	**Total Revenue Year 10**	**Total Revenue**
Revenue			Ha													
Forest enterprises promoted & supported	Non-Timber Forest Products	Kg	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Fuelwood and Charcoal	cords	-	1	-	-	-	-	-	-	-	-	-	-	-	-
	Eco-Tourism and Recreation	Services	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	Educational and Research Permits	Services				-	-	-	-	-	-	-	-	-	-	-
	Licenses and Permits	Services	1	1	-	-	-	-	-	-	-	-	-	-	-	-
	Concessions and Leasing	Services	1	1	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	600,000
1 Carbon trading benefit	Carbon t/ha/yr inc 10% per yr	Hectare	57,929	1	75	3,041,262	3,345,388	3,679,927	4,047,920	4,452,712	4,897,983	5,387,781	5,926,559	6,519,215	7,171,137	48,469,884
2 Small woodlots	Carbon t/ha	Hectare	5	1	75	375	413	495	644	901	1,351	2,027	3,243	5,514	9,924	24,886
3 Agroforestry	Assume 1tC/ha inc to 2 t/ha yr 10	Hectare	20	1	75	1,500	1,650	1,815	1,997	2,196	2,416	2,657	2,923	3,215	3,537	23,906
4 Natural regeneration	Assume 1tC/ha inc to 2 t/ha yr 10	Hectare	50	1	75	3,750	4,125	4,538	4,991	5,490	6,039	6,643	7,308	8,038	8,842	59,765
														Revenue sub to	**ZMW**	**49,178,442**
														Surplus	**ZMW**	**41,768,955**

REPUBLIC OF ZAMBIA

Ministry of Green Economy & Environment

The Zambia Integrated Forest Landscape Project (ZIFLP) is a government initiative which provides support to rural communities in the Eastern Province to allow them to better manage the resources of their landscapes so as to reduce deforestation and unsustainable agricultural expansion; enhance benefits they receive from forestry, agriculture, and wildlife; and reduce their vulnerability to climate change.

Simultaneously the project is creating the enabling environment for emission reduction purchases to be done through the subsequent phase - the Zambia Eastern Province Jurisdictional Sustainable Landscape Programme (EP-JSLP).

The ZIFLP & JSLP are a cooperation between the Government of Zambia, the World Bank & partners.

Forestry Department

Supported by:

Zambia Integrated Forest Landscape Project

Improving lives through sustainable management of natural resources

WORLD BANK GROUP

BioCarbon Fund

Initiative for Sustainable Forest Landscapes

gef

GLOBAL ENVIRONMENT FACILITY

INVESTING IN OUR PLANET