



MATANDWE-MWABVI
PROTECTED AREA
COMPLEX
INTEGRATED MANAGEMENT
PLAN

DEPARTMENTS OF FORESTRY AND
NATIONAL PARKS AND WILDLIFE,
MALAWI

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Table of Contents

Table of Contents.....	i
List of Tables	iv
List of Figures	v
List of Acronyms and Abbreviations.....	vi
Preface.....	vii
Approval Page.....	ix
Executive Summary.....	x
1. Background Information.....	1
1.1 Introduction to the Integrated Management Plan Process.....	1
1.2 Definition of an Integrated Management Plan (IMP)	1
1.3 Specific Values of the IMP	1
1.4 Legislative History of the Matandwe-Mwabvi Protected Area Complex.....	2
1.4.1 History of Establishment of Matandwe Forest Reserve (MFR)	2
1.4.2 History of Establishment of Mwabvi	2
1.5 Climate	4
1.6 Biophysical Resources	4
1.6.1 Physical Resources.....	4
1.6.2 Biological Resources	7
1.7 Socio-Economic, Tenure and use of adjacent land	10
1.8 Wealth Ranking in the Impact Area.....	13
1.9 Source of Income	14
1.10 Land Tenure System.....	14
1.11 Economic Context	16
2. IMP process, principles and constraints.....	16
2.1 The IMP Process	16
2.2 The IMP Guiding Principles	18
2.2.1 Interdisciplinary planning teams.....	18
2.2.2 Practical and Realistic IMP.....	19
2.2.3 Involvement of the public	19
2.2.4 Interactive approach.....	19
2.2.5 Ownership of the IMP.....	19
2.2.6 Respecting institutional, legal and policy differences	20
2.2.7 Integration of regional issues	20
2.3 The IMP constraints and implementation process	20
2.3.1 Parallel administration	20
2.3.2 Funding mechanisms and levels	21

2.3.3	Policy frameworks	21
2.3.4	Legal frameworks	22
3.	Existing situations of the MMPAC.....	22
3.1	Problem, issues and concerns.....	22
3.1.1	Natural Resources	23
3.1.2	Tourism and Revenue	26
3.1.3	Protected Area Management.....	28
3.1.4	Human-Wildlife relations	29
3.2	SWOT Analysis.....	34
3.2.1	Matandwe Forest Reserve.....	34
3.2.2	Mwabvi Wildlife Reserve	35
3.3	Outstanding resources and values	35
4.	Vision, Mission and Management Objectives	36
4.1	Vision	36
4.2	Mission.....	36
4.3	Management objectives and indicators	36
4.3.1	Protected area management	36
4.3.2	Community	37
4.3.3	Generalized Performance Indicators for the MMPAC	37
5.	Management Zone Scheme.....	37
5.1	What is management zoning?	37
5.2	Development of management zone scheme	37
5.3	Criteria for the management zone scheme	38
5.4	Management zone scheme for the Mwabvi-Matandwe	38
5.4.1	Wilderness Zone	41
5.4.2	Semi-wilderness zone	42
5.4.3	Administrative zone	42
5.4.4	Visitor development zone	43
5.4.5	Co-management Zone	43
5.5	Identification of zone boundaries on the ground	43
6.	Plan of Action	44
6.1	Strategies and activities to achieve the objectives	44
6.1.1	Protected Area Management.....	45
6.1.2	Community Involvement	50
7.	Environmental and Social Impact Assessment (ESIA)	55
7.1	What is environmental and social impact assessment?	55
7.2	Importance of EIA/ESIA.....	56

7.3	Management actions for environmental and social assessment	56
7.4	Environmental topics for environmental assessment	56
7.5	Environmental and social statements	57
7.6	Detailed description of environmental and social assessment	58
7.6.1	Impacts on revenue	58
7.6.2	Local communities.....	58
7.6.3	Biodiversity conservation	59
7.6.4	Ecosystem maintenance and ecological integrity	59
7.6.5	Staff morale, workloads and performance	60
7.6.6	Site and action specific EIA/ESIA required	60
8.	Implementation strategy and process.....	61
8.1	Annual operation plan and budget	61
8.2	Formation of the IMP implementation team	62
8.3	Monitoring and evaluation framework.....	63
8.4	Staff Requirements	64
8.5	Fixed capital requirements	65
8.6	Movable capital requirements	66
8.7	Memorandum of Understanding and an agreement	68
9.	Bibliography	69

List of Tables

Table 1: Matandwe forest reserve DBH distribution	7
Table 2:Vegetation communities in Mwabvi Wildlife Reserve	8
Table 3: Vegetation types of the Mwabvi Wildlife Reserve.....	8
Table 4:Population of people surrounding MMPAC.....	31
Table 5: Protected Area Management Plan of operation	45
Table 6: Community Involvement Plan of Operation and budget	50
Table 7: Environmental Assessment Matrix.....	60
Table 8. Terms of Reference of IMPIT	62
Table 9: Existing and required staff (MWR)	64
Table 10: Types and Amount of Fixed Capital Developments Required (MWR)	66
Table 11:Types and Amount of Fixed Capital Developments Required (MFR).....	66
Table 12. Types and Amount of Existing and Required Movable Capital.....	66
Table 13: Types and Amount of Existing and Required Movable Capital (MFR).....	67

List of Figures

Figure 1: Map of Mwabvi-Matandwe Protected Area Complex showing the topography.....	3
Figure 2: Geology of Mwabvi Wildlife Reserve	5
Figure 3: Mwala wa nkhunda	6
Figure 4: Soils of Mwabvi Wildlife Reserve	6
Figure 5: Map of land cover of Mwabvi Matandwe Protected Area Complex	9
Figure 6:Wealth ranking graph	13
Figure 7: Number of households per livelihood activity	14
Figure 8: Categories of land tenure.....	15
Figure 9: A summary of the process followed in developing the plan	18
Figure 10: Timber sawing (L) and Poachers arrested for killing a Buffalo (R)	23
Figure 11: Bush fires (L) and encroachment (R) in Matandwe Forest Reserve	24
Figure 12: Monthly incidences of fires in Mwabvi-Matandwe Protected Area Complex.....	25
Figure 13: Poor Road conditions and network	27
Figure 14: Resource extraction from MMPAC by local people	30
Figure 15: Encroachment in Matandwe Forest reserve	31
Figure 16: Map showing management zones in MMPAC.....	40
Figure 17: ESIA process	55

List of Acronyms and Abbreviations

AOPB	Annual Operation Plan and Budget
CBNRM	Community Based Natural Resources Management
CBO	Community Based Organisations
CPT	Core Planning Team
DBH	Diameter at Breast Height
DFO	District Forestry Officer
DNPW	Department of National Parks and Wildlife
DoF	Department of Forestry
EIA	Environmental Impact Assessment
EMA	Environment Management Act
EPA	Extension Planning Area
ESIA	Environmental and Social Impact Assessment
FD	Forestry Department
FMP	Fire Management Plan
FR	Forest Reserve
FRIM	Forestry Research Institute of Malawi
FT	Full Team
GIS	Geographical Information System
GVH	Group Village Headman
HQ	Headquarter
IGA	Income Generating Activities
IMP	Integrated Management Plan
IMPIT	IMP Implementation Team
LAU	Limits of Acceptable Use
LFB	Local Forestry Board
LSD	Lower Shire Division
MFR	Matandwe Forest Reserve
MGDS	Malawi Growth and Development Strategy
MWR	Mwabvi Wildlife Reserve
MMIMP	Mwabvi-Matandwe Integrated Management Plan
MMPAC	Matandwe-Mwabvi Protected Area Complex
MoU	Memorandum of Understanding
NGO	Non- Governmental Organisation
NGP	Nominal Group Process
NRC	Natural Resources Committee
ORT	Other Recurrent Transactions
SWOT	Strength Weakness Opportunity and Threat
TA	Traditional Authority
ToRs	Terms of Reference
VDZ	Visitor Development Zone
VFA	Village Forest Area
VNRMC	Village Natural Resources Management Committee
WR	Wildlife Reserve

Preface

Malawi is endowed with a rich and diverse wildlife resource base that provides much-needed ecosystem services and goods for the socio-economic development of the country. The Malawi Growth and Development Strategy III (MGDS III) (GoM, 2017) and the Malawi Vision 2063 (National Planning Commission, 2020) identifies biodiversity conservation as one of the sectors that could potentially contribute to the sustainable economic growth of the country, and calls for conservation and management of wildlife in protected areas and outside natural habitats. Most of the wildlife and its habitat largely occur inside protected areas, which require careful planning and management to maximise their socio-economic and ecological potential.

The Matandwe-Mwabvi Protected Area Complex (MMPAC) consists of the Matandwe Forest Reserve adjoining the Mwabvi Wildlife Reserve found in Nsanje District. The Department of National Parks and Wildlife (DNPW), and the Department of Forestry (DoF) have been managing these two ecologically connected areas as separate entities. The linking of the two reserves provides an opportunity for a collaborative management approach to manage the two protected areas as a single ecosystem. This will strengthen biodiversity conservation and enhance landscape connectivity.

This Integrated Management Plan (IMP) provides the framework within which the private sector, local communities, development partners, civil society and all other stakeholders must operate and interact to sustainably conserve and develop the biodiversity resource base in Matandwe-Mwabvi Protected Area Complex for the sustainable socio-economic contribution to the overall socio-economic growth of Malawi. It is an adaptive and dynamic document that should be revised to reflect changing conditions of the MMPAC. The Integrated Management Plan sets out the basic management and development philosophy of the MMPAC. It sets out the existing situation (issues, resource values, protected area purposes and significance); the aims of the protected area (vision, goal and management objectives); and the means to achieving desired situation (management zone and plan of action) over a period of 5 years. As an adaptive management plan, it can be revised accordingly to reflect circumstances within this 5-year implementation period.

The IMP is divided into eight chapters. The first chapter presents the background including the history of establishment of the protected areas and an overview of the MMPAC ecology; the second chapter focuses on planning process, principles and constraints; the third chapter on problem analysis; the fourth chapter on vision, mission and management objectives; the fifth chapter on management zone scheme of the protected area complex; and chapters six, seven and eight are focusing on the plan of action, environmental and social impact assessment and the implementation strategy respectively. The vision is to make the Mwabvi-Matandwe Protected Area Complex an integrated, well managed and self-financing landscape in which biodiversity is protected, essential ecological processes are sustained, and the surrounding communities and other stakeholders fully support and realistically benefit from conservation efforts. The Department of National Parks and Wildlife, and the Department of

Forestry therefore, appeal to all stakeholders to join hands with Government in this noble task of biodiversity conservation.

Approval Page

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INTEGRATED MANAGEMENT PLAN FOR MATANDWE-MWABVI PROTECTED AREA COMPLEX

Executive Summary

This management plan is for the Matandwe-Mwabvi Protected Area Complex (MMPAC) which consists of the Matandwe Forest Reserve adjoining the Mwabvi Wildlife Reserve in Nsanje District. Mwabvi Wildlife Reserve is managed by the Department of National Parks and Wildlife (DNPW) while Matandwe Forest Reserve belongs to the Department of Forestry (DoF). The two departments use different management approaches yet the two protected areas share the same biophysical aspects (landform, vegetation & biodiversity), as well as similar threats to biodiversity conservation. To harmonize the approaches and management the two protected areas as an ecosystem, development of integrated management plan was proposed at a workshop involving DNPW and DoF was held on 2nd and 3rd June in Thyolo

The protected areas complex of Matandwe Forest Reserve and Mwabvi Wildlife Reserve occupy a tract of broken terrain on the western side of the Lower Shire Valley. Matandwe is a stretch of mountains covering four Traditional Authorities (TAs) of Ngabu, Malemia, Tengani and Mbenje. Among the four TAs, the larger part of the reserve is under the TA of Chief Tengani. The entire reserve falls within Zunde, Mpatsa and Magoti Extension Planning Area (EPA). The reserve is approximately 264km² and adjoins Mwabvi Wildlife Reserve to the northwest which covers the two TAs of Tengani and Mbenje (Figure 1). Mwabvi is 135 km² in size and centred upon 16°40'S, 35°05'E (Munthali, 2016).

Common management challenges facing both protected areas include:

- High population density ;
- Illegal late hot wildfires caused by bordering communities due to overgrown boundaries and since early burning practices are rarely observed’;
- Cross boarder poaching and logging due to proximity to Mozambique border;
- Rampant poverty;
- Extreme climatic change;
- Inadequate staff (e.g. prosecutors, trained staff);
- Persistent natural disasters e.g. draughts that lead to food insecurity;
- Rampant Illegal activities (charcoal production, settlements, cultivation, mining);
- Inadequate road network;
- Insufficient ranger camps to adequately cover the reserves;
- Poor accessibility during rainy season;
- Poor state of tourist facility;
- Unclear boundary in some areas;
- Inadequate community participation;
- Low funding.

To address the above challenges, objectives were set and strategies developed. The objectives are split into two components: Protected Area (PA) Management and community involvement. With respect to protected area management, there are six objectives as follows:

1. To reduce illegal activities in MMPAC;
2. Strengthen law enforcement capacity to combat illegal activities in PA;
3. To improve protected area management and ecotourism infrastructure facilities and equipment;
4. To adequately monitor biodiversity for efficient management of the MMPAC;
5. To strengthen collaboration and coordination amongst stakeholders on PA management;
6. Improve habitat management.

Community involvement components has three objectives namely:

1. To improve capacity to manage and regulate community resource use programs;
2. To build capacity and improve community support and participation in sustainable management of natural resources;
3. To improve livelihoods for local communities through facilitating and promoting sustainable IGA's and conservation-based investments;

For each objective, strategies and activities have been proposed and included in the five-year plan of operation and budget (Table 5 and Table 6).

1. Background Information

1.1 Introduction to the Integrated Management Plan Process

Matandwe-Mwabvi Protected Area Complex (MMPAC) consists of the Matandwe Forest Reserve adjoining the Mwabvi Wildlife Reserve found in Nsanje District. The Department of National Parks and Wildlife (DNPW), and the Department of Forestry (DoF) have been managing these two ecologically connected areas as separate entities. The linking of the two reserves provides an opportunity for a collaborative management regime between the two departments. A workshop was organized in Thyolo on 2nd and 3rd June 2020 to consider the different approaches to managing the two protected areas and how they can be managed as a single ecosystem. This was noted to be a policy matter which the two respective directors should address and give directions to the planning team. These two protected areas share the same biophysical aspects (landform, vegetation & biodiversity), as well as similar threats to biodiversity conservation. The approach to manage the two reserves as a single entity is based on the model of the Liwonde-Mangochi Protected Area Complex under the effective management of the African Parks Network (APN). At that workshop, the mission, vision and objectives were developed and the planning team was asked to produce the draft that was shared to others within the two departments and presented to stakeholders for their input.

1.2 Definition of an Integrated Management Plan (IMP)

An Integrated Management Plan (IMP) is an adaptive and dynamic document that should be revised to reflect changing conditions of the MMPAC and technology. A five-year timeframe is intended to guide implementation of this IMP and should not be considered as absolute. As an adaptive management plan, it can be revised accordingly to reflect circumstances within the five year implementation period. As such it is recommended that the management plan is reviewed at the end of five years. The revisions will concentrate on the following three areas:

- Existing situation (issues, resource values, protected area purposes and significance);
- Desired situation for the protected area (vision, goal and management objectives); and
- Means to achieving desired situation (management zone and plan of action).

1.3 Specific Values of the IMP

Protected area planning occurs on two levels namely general and specific. It is important to note that through the IMP, MMPAC managers and stakeholders are able to identify problems, envisage the future under existing conditions or trends and develop strategies and a program of actions for achieving desired future conditions. Therefore, the IMP provides MMPAC managers with a framework for day-to-day operations as well as long-term management, and thus ensures continuity. Furthermore, the IMP can be used as a public relations document to help direct and raise funding for actions identified in the plan. The IMP provides a framework for rational allocation and use of the MMPAC resources.

Without an IMP, it would be very difficult to achieve the vision of the MMPAC as an integrated, well-managed and self-financing protected area, as the development and use activities in the complex would occur on a haphazard basis, often in response to political and

socio-economic pressures. The results would most likely be lost opportunities and irreversible damage to MMPAC resource and values.

In a nutshell this IMP is an important source of information for any geographic, biophysical, social or economic questions in relation to the MMPAC. The IMP gives priority to activities that should be performed, offering answers about what to do, where and how and establish norms for use of the land, defining what can and what cannot happen on different MMPAC lands.

1.4 Legislative History of the Matandwe-Mwabvi Protected Area Complex

1.4.1 History of Establishment of Matandwe Forest Reserve (MFR)

There is little information on the legislative history of the Matandwe Forest Reserve. The reserve was gazetted in 1929 for water catchment conservation and other biodiversity services. According to the 2012 to 2017 forest reserve strategic area plans, MFR has a total area of 26,381 hectares (ha). However, this size could be much smaller than the actual size now since the reserve has been encroached and excised several times.

The forest reserve is located in the Rift Valley scarp zone, comprising a range of hills including Mulaka in the north and Natundu in the south. In the northwest, the reserve is bordered by Mwabvi Wildlife Reserve. The forest reserve extends from approximately 16037'S just south of Bangula to 16055/S along Malindi river. The soils are lithosols (shallow and stony on steep slopes). The vegetation is open canopy woodland of hills and scarps dominated by *Brachystegia* species, especially *B. boehmii* and a degraded form of *Uapaca kirkiana* (National Atlas of Malawi, 1983).

1.4.2 History of Establishment of Mwabvi

Mwabvi Wildlife Reserve (125 km²) was proclaimed in 1953 and included all of the Thangadzi Stream Reserve which had originally been established in 1928 (ULG, 2001). In 1975 the Reserve was extended to the international boundary with Mozambique thus increasing its size to 340 km². The boundary which included this extension is described in the Proclamation of Alteration of Boundaries (Mwabvi Game Reserve), 13th May 1975, published as Government Notice No.146 of 1975. Several residents, including those of Misamvu village, were moved out of the extended area prior to the gazetting as a consequence of civil unrest in Mozambique. In 1982 the people of Misamvu Village made representation to their member of parliament to be allowed back into their former homeland. This request was granted by presidential order on 29th January 1982. It was then decided to reduce the reserve approximately to its pre-1975 dimensions and the officer-in-charge reported on 21st June 1982 that the new boundary had been demarcated on the ground. People had already begun to settle the area outside the new line.

The name 'Mwabvi Game Reserve' was changed to 'Mwabvi Wildlife Reserve' by the National Parks and Wildlife Act (Act No.11 of 1992) which repealed the earlier Game Act (Cap. 66:03).

1.4.3 Location and size of Matandwe and Mwabvi Protected Area Complex

The protected areas complex of Matandwe Forest Reserve and Mwabvi Wildlife Reserve occupy a tract of broken terrain on the western side of the Lower Shire Valley. The Matandwe is a stretch of mountains covering four Traditional Authorities (TAs) of Ngabu, Malemia, Tengani and Mbenje. Among the four TAs, the larger part of the reserve is under the TA of Chief Tengani. The entire reserve falls within Zunde, Mpatsa and Magoti Extension Planning Area (EPA). The reserve is approximately 264km² and adjoins Mwabvi Wildlife Reserve to the northwest which covers the two TAs of Tengani and Mbenje (Figure 1). Mwabvi, 135 km², is centred upon 16°40'S, 35°05'E (Munthali, 2016).

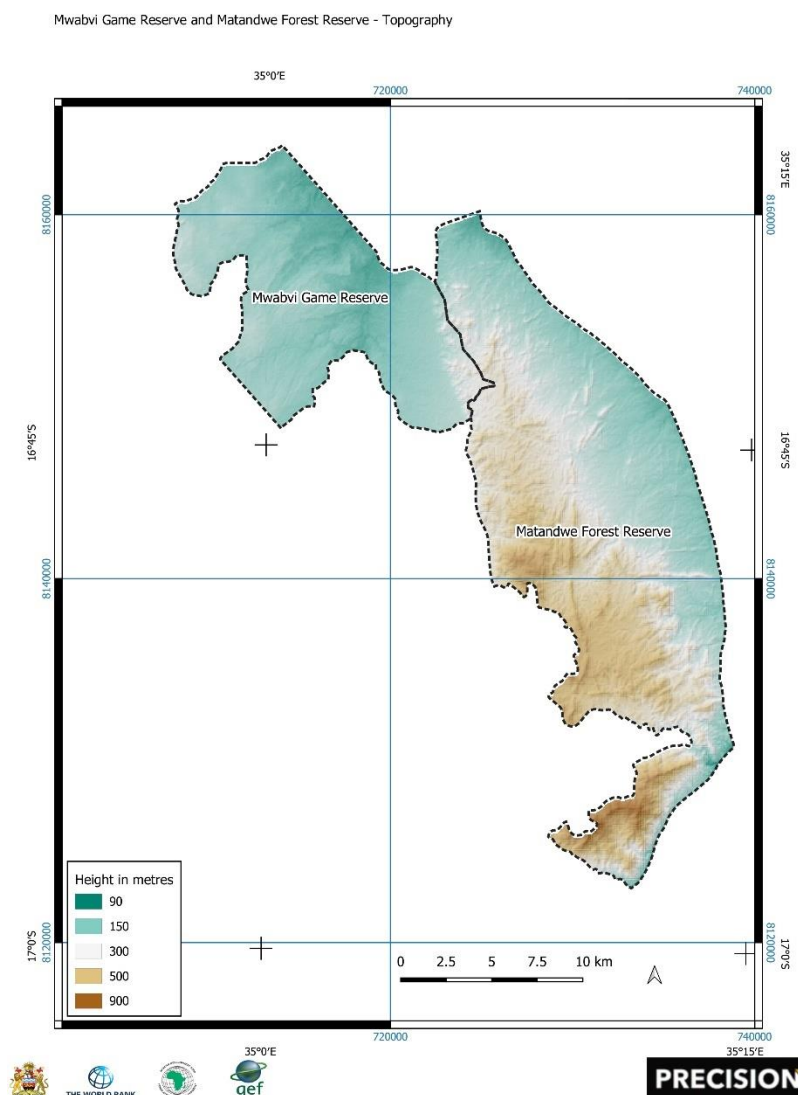


Figure 1: Map of Mwabvi-Matandwe Protected Area Complex showing the topography
Source: Precision, 2021

1.5 Climate

The average annual rainfall in the low altitude parts [<200m above sea level (asl)] of Mwabvi Wildlife Reserve is about 730mm, rising to about 900mm in the higher areas (>350m asl). The mean minimum and maximum temperatures are 13.2°C and 27.8°C in June and 22.0°C and 36.5°C in November. Due to high temperatures, evaporation is high, ranging from 107 mm in June to 274 mm in October. The annual total evaporation is slightly under 2,000 mm, which considerably diminishes the value of the limited rainfall.

The low altitude areas (<200m a.s.l) which are mostly to the north of the MMPAC receive less rainfall of average 730mm on average while the southern areas that have relatively higher altitude (>350m asl) receive more rains of average 900mm. The temperature is hot as much as 36 °C in November resulting to high evaporation while low temperatures are experienced in June with mean minimum of 13.2°C (Muathali, 2016).

1.6 Biophysical Resources

1.6.1 Physical Resources

1.6.1.1 Physiography

Matandwe Forest Reserve has relatively higher altitude of 968 meters a.s.l while the major part of Mwabvi Wildlife Reserve is a low-lying area centred on the Thangadzi River with an altitude of about 120m a.s.l at its entry point in the south and about 100m a.s.l at exit point in the north. The altitudes for Mwabvi WR rise to a height of about 225 metres on the either side of Thangadzi and in the east, a small area (about 15 km²) of the Mulaka Hills falls while the highest altitude is slightly over 400m. The reserve is effectively a small basin flanked on the southern, eastern and western sides by the watershed hills of the international boundary with Mozambique (Munthali, 2016). Very little of this higher broken country occurs within the reduced boundary of the reserve.

The topography within the reserve is generally broken with steep sided outcrops of rock set between gullies. A relatively flat dambo (wetland) runs through the centre of the reserve from the Kanyimbi area in the south-west to the Thangadzi River in the north-east about 1 km north of Migudu (the drainage immediately south of and parallel to the Dande River). This attractive 'vlei' forms the central focus for wildlife in the reserve (Munthali, 2016).

1.6.1.2 Hydrology

The Matandwe Forest Reserve (FR) is the watershed for several tributaries flowing into the main Shire River such as the Malindi, Nyamadzere, Phanga, Mchekamalembo, Nyamithutu,

Nyamikolongo, Nyamikango, Thangadzi, Mwanabweri and Nyanjiwa rivers (Nsanje District Council, 2013).

Almost 98% (122km² of Mwabvi Wildlife Reserve (WR) falls within the Thangadzi River catchment. A small area in the north (the Namitalala dambo - 3km²) drains into the Elephant Marsh and, in the north-west, the Madziabango drains into the Lalanje River which joins the Shire River at Mbenje (Munthali, 2016).

The river flow in the reserve is seasonal but pools persist in the Thangadzi and Mwabvi stream beds throughout the year and in most of the other streams there is water until late into the dry season. The presence of these pools largely depends on the amount of rains received in a particular year such that years of drought have fewer pools than years of good.

1.6.1.3 Geology

The reserve is based upon Karroo system sediments of grits sandstones, calcareous shales and marls (Clarke, 1983). An area of Basement Complex Gneisses (Horneblend & Pyroxene) underlies the eastern high ground of the Malaka Hills. Figure 2 below shows the geology of the Mwabvi Wildlife Reserve.

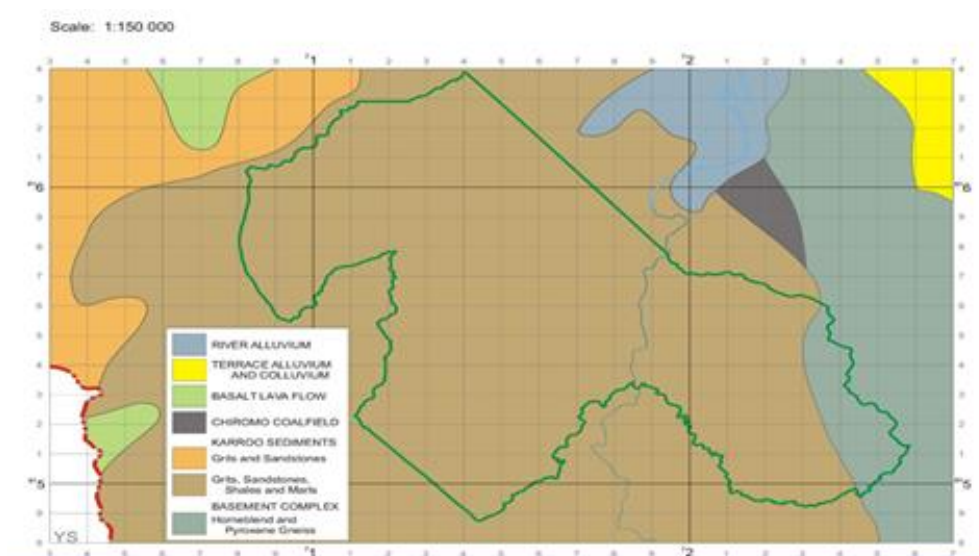


Figure 2: Geology of Mwabvi Wildlife Reserve

Source: Munthali, 2016.

Geomorphologically, Mwabvi Wildlife Reserve has a number of special areas, such as:

- a) Mwabvi Gorge on the Mwabvi River. The gorge is known as Ndipitakuti - literally "where do I go from here?" A relic fish population of *Barbus choloensis*, of conservation importance occurs in the pools of the gorge.

- b) Mwalawankhunda (literally 'Stone of Doves' - a free-standing sandstone rock pitted with depressions which are sometimes used as nesting sites by birds (Figure 3). Oral tradition has it that the holes are man-made dug out of the rock to obtain certain mineral components of gunpowder.



Figure 3: Mwala wa nkhunda

- c) Nkhangane rock protrusion - a steep-sided rock with numerous caves, recesses and overhangs. A tradition holds that the rock is inhabited by dead spirits.

1.6.1.4 Soils

The soils for both reserves are largely lithosols and shallow, grey brown earths (Clarke, 1983). A few small intrusions of Makande Plain lithomorphous vertisols occur in the north-west of the reserve along the Lalanje and Namitalala Rivers (Figure 4). The large thicket areas in the centre of the reserve suggest the existence of colluviums derived from the erosion of sandstone hills.

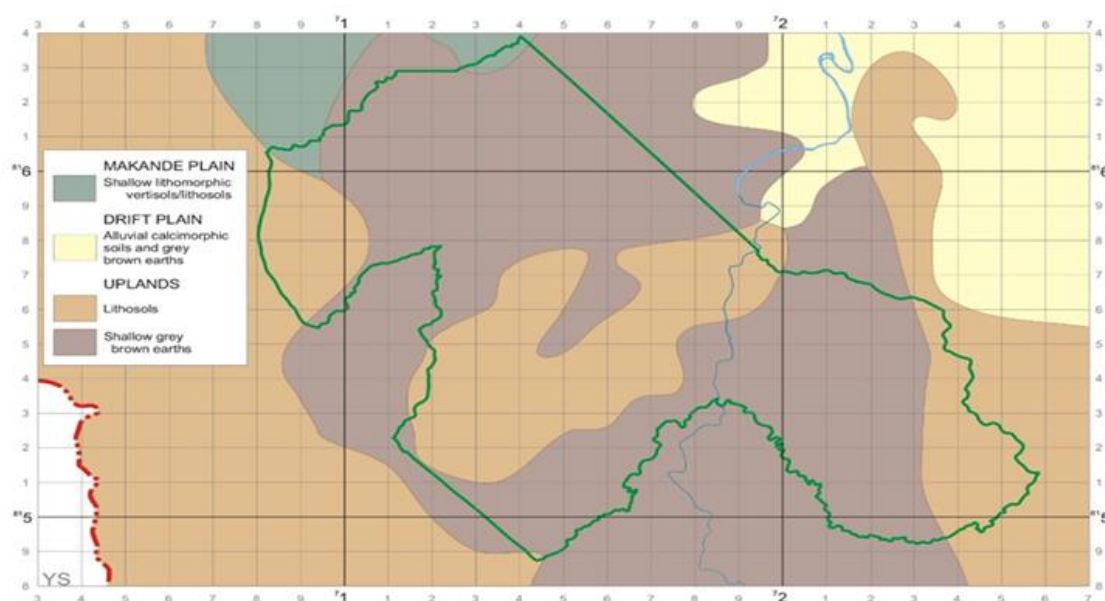


Figure 4: Soils of Mwabvi Wildlife Reserve

Source: Munthali, 2016

1.6.2 Biological Resources

1.6.2.1 Vegetation

The Matandwe forest reserve is characterized by Miombo woodland with species like *Brachystegia speciformis* (Miombo), *Brachystegia floribunda* (Tsamba), *Lonchocarpus floribunda* (Tsamba), *Lonchocarpus capassa* (Mphakasa), *Combretum imberbe* (Mtsimbiti), *Acacia galpinii* (Mkunkhu), *Adansonia dingitata* (Mlambe) and there is a lot of *Khaya anthonthea* along the rivers of the reserve and surrounding customary forests. Due to illegal activities taking place in the reserve, a lot of trees have been depleted and as such the vegetation is open canopy woodland of hills and scarps dominated by *Brachystegia* species, especially *B. boehmii* and degraded form of *Uapaca kirkiana*. According to the most recent vegetation survey (M. Mwanyambo, *et al.* 2019) a total of 107 species were recorded in 39 families in Matandwe forest. Fabaceae was the most dominant species composition followed by Poaceae, Rubiaceae and Combretaceae families. The most dominant tree species include *Diplorrhynchus condylocarpon*, *Brachystegia longifolia*, *Pterocarpus rotundifolia* and *Combretum zeyheri* as ranked by importance value. *D. condylocarpon* draws its dominance largely from stem density; it appears to coppice rather profusely when cut and it is a fire hardy species. *Brachystegia longifolia* and *P. rotundifolia* had a greater proportion of basal area. Diameter at breast height is skewed at lower diameter classes, with diameter class <15cm comprising 83.56%. *Acacia nigrescens*, *B. longifolia*, *Diospyros kirki*, *Lecaniodiscus flaxinifolius* and *P. rotundifolia* having stems above 50cm.

Table 1 below shows diameter at breast height (DBH) classes of common tree species in Matandwe Forest Reserve.

Table 1: Matandwe forest reserve DBH distribution

Diameter at Breast Height (DBH) class (cm)	Stem count	% Stem count
≤5	282	35.12
>5≤10	284	35.37
>10≤15	105	13.08
>15≤20	42	5.23
>20≤25	28	3.49
>25≤30	22	2.74
>30≤35	12	1.49
>35≤40	11	1.37
>40≤45	4	0.50
>50≤55	1	0.12
>55≤60	3	0.37
>60≤65	4	0.50

>65≤70	2	0.25
>70	3	0.37

From Table 1, it is clear that the most common DHB range was up to 10 cm and the least common was greater than 70 cm.

The vegetation of Mwabvi Wildlife Reserve falls into the category of “Broad leaved relatively dry woodlands and intergrades to savanna” – Category 9 defined by Shaxon (1977) and mapped by the Department of Surveys (1979). Clarke (1983) quantified the broad vegetation communities in Mwabvi Wildlife Reserve as shown in Table 2.

Table 2:Vegetation communities in Mwabvi Wildlife Reserve

Vegetation community	Dominant species	Percentage %
Mopane woodland	<i>Colophospermum mopane</i>	38.2
Woodlands of fertile areas	<i>Adansonia, Cordyla, Faidherbe</i>	2.4
Thicket/Savanna of poorer areas	<i>Combretum & Acacia</i>	59.4

The major part of the reserve is occupied by mopane woodland, thicket and mixed closed woodland. The Central Dambo and the riverine woodlands which together occupy less than 10% of the reserve, are aesthetically very appealing (ULG, 2001).).

The Malawi District and National Land Management Mapping Project listed seven vegetation types shown in Table 3.

Table 3: Vegetation types of the Mwabvi Wildlife Reserve

Vegetation types	Size (km ²)	Percentage %
Riverine woodland	13	9
Riparian thicket & Mopane woodland	41	30
Dry deciduous thicket	25	19
Mixed closed woodland (medium altitude)	35	26
Eastern Uplands Woodland	12	9
Grasslands and open savanna (including the Central Dambo)	8	6
Old cultivated lands	2	1

Source: GoM, 2005

Land use cover for Mwabvi is presented in Figure 5.

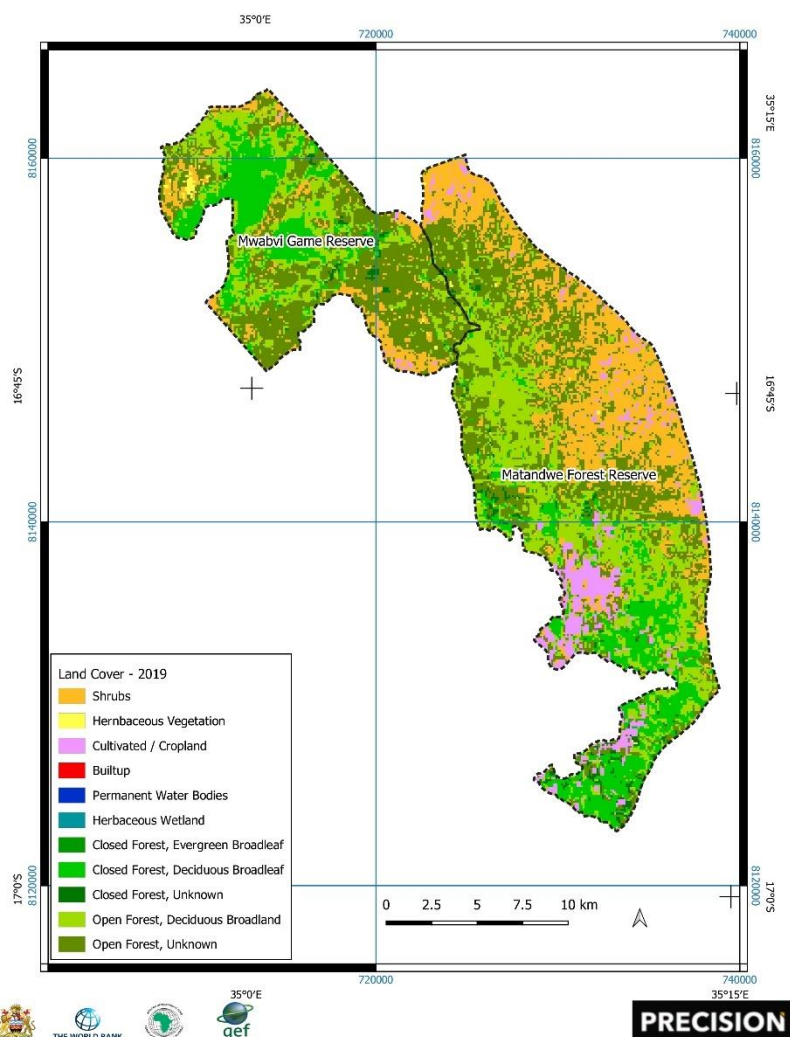


Figure 5: Map of land cover of Mwabvi Matandwe Protected Area Complex
Source: Precision, 2021

1.6.2.2 Animals

Forty-seven species of mammals, 185 species of birds and 8 species of fish have been recorded in Mwabvi Wildlife Reserve (see Mwabvi WR Management Plan of 2000 for details) (ULG, 2001). One fish species, *Barbus cholensis* is endemic to the reserve. Mwabvi harbours the most northerly populations of bird species such as Rudd's apalis (*Apalis ruddi*), Woodward batis (*Batis fratrum*) and Grey sunbird (*Cyanomitra verreauxii*), as well as the only protected populations in Malawi of double-banded Sandgrouse (*Pterocles bicinctus*) and Black-tailed grey waxbill (*Estrilda perreini*). Although there is little information on bird species, it is likely that most of these species are also available in Matandwe. The most commonly seen mammals include greater kudu (*Tragelaphus strepsiceros*), buffalo (*Bubalus bubalis*), impala (*Aepyceros melampus*), suni (*Neotragus moschatus*), and common duiker (*Sylvicapra*

grimmia) which have been observed moving to Matandwe where water is available especially in dry season.

1.6.2.2.1 Extinct species

Extinct species in Mwabvi include elephant (*Loxodonta Africana*) reedbuck (*Redunca arundinum*), zebra (*Equus quagga*), hartebeest (*Alcelaphus buselaphus*), black rhinoceros (*Diceros bicornis*), and wild dog (*Lycaon pictus*). The DNPW should consider re-introducing these in Mwabvi WR.

1.6.2.2.2 Rare, endangered and endemic species

Clarke (1983) listed the following species as requiring conservation attention in Mwabvi Wildlife Reserve:

- a) *Rhynchocyon cirnei shirensis*: a subspecies of checkered elephant shrew endemic to Malawi;
- b) Nchima or Samango monkey (*Cercopithecus albogularis*): Fairly rare in Malawi;
- c) Nyala antelope (*Tragelaphus angasi*): Part of the most northerly population in Africa, protected only in Lengwe National Park and Mwabvi Wildlife Reserve;
- d) Suni (*Neotragus moschatus*): A rare species in Malawi, also protected only in Lengwe National Park and Mwabvi Wildlife Reserve. The subspecies *livingstoni* which occurs here, whilst not endemic to Malawi, has a very restricted range;
- e) Sable antelope (*Hippotragus niger*): The sable population of Malawi and eastern Zambia may represent a subspecies;
- f) Double-banded sandgrouse (*Pterocles bicinctus*): Mwabvi is thought to contain Malawi's only protected population of the species although it is common elsewhere in southern Africa;
- g) Black-tailed grey waxbill (*Estrilda perreini incana*): Mwabvi is thought to contain Malawi's only protected population of the species;
- h) *Barbus choloensis*: The relict population of this fish species in Mwabvi Gorge may be the only one of its type in the Lower Shire Valley.
- i) Wild dog (*Lycaon pictus*) is currently an extirpated species in the reserve. According to reports by Mwabvi, Wild dog was last sighted by communities from adjacent Chithumba Village in 1986. Prior to this, 5 sightings were made from 1980 at Mkotamu (1980-81) and Nyanjidu (1983);

1.7 Socio-Economic, Tenure and use of adjacent land

Land tenure in the district is under three categories: public, private and customary. Total land area for the District is 1,942 square kilometres (193, 132 hectares). Over 65% of land in the

District is under customary land while public and private land constitutes 20% and 15% of the land, respectively (Nsanje District Council, 2017).

Customary land, which constitutes 65 % of the total land, is held on trust by traditional leaders namely, Chiefs, Group Village Heads and Village and is passed on in succession from one generation to another, in order of importance of male relatives by birth right and marriage. Traditional leaders are responsible for land allocation and settling of the land disputes. A few disputes are referred to the District Commissioner. Customary land in the District is mainly used for subsistence farming and grazing. Men tend to own larger pieces of land compared to their female counterparts because of patrilineal marriage system which favours men (Nsanje District Council, 2017).

Public land is held by government on behalf of the population. This land covers areas where government buildings, roads, the railway line, game reserves, forest reserves, public schools, public hospitals, District council facilities and national monuments are located. Currently, it is estimated that public land constitutes 20% of land (District Agriculture Office, 2017).

Land under private ownership, which constitutes 15% percent of total land in the District, is either freehold or leasehold. Leasehold land is land leased for a period of between 21 to 99 years. In the district, freehold land is mostly owned by religious bodies namely: the Catholic Church institutions at Nsanje Catholic Parish, Saint Kalemba Parish, Trinity Hospital, College of Nursing and Midwifery and Parish; and the Africa Evangelical Church at Lulwe and Chididi Missions. Some land in this category is for cattle ranching and sugarcane production including 3312 ha at Kaombe Estate in T/A Mbenje (Nsanje District Council, 2017).).

The primary land use outside the two reserves is subsistence agriculture, that is crop and livestock production. Major food crops grown by surrounding communities of MMPAC are Sweet potatoes, Maize, millet and sorghum. Maize is mostly grown around Chididi, Lulwe and Sorgin areas within the wetlands along the Shire River and around the marshes. Sorghum and millet are mostly grown in the Rift Valley floor. Other major food crops are; cassava which is mainly grown in TA Malemia. Other crops grown in the MMPAC are sugarcane, pigeon peas, and fruits like paw paws, bananas, Oranges, avocados and pineapples. Cotton is the major cash crop in TA Mbenje while rice is grown in TA Ngabu and most parts of the Shire River banks. Maize and vegetables are grown as commercial crops along the Shire River. Citrus fruits and avocados are mainly grown in TA Malemia (Chididi hills), and TA Makoko (Nsilanga area) (Nsanje District Council, 2017). Cultivation methods are predominantly traditional with little use of fertilizer, and little irrigation or application of improved management techniques.

Main livestock types kept include cattle, goats, sheep, pigs and chicken. Cattle numbers are relatively low but other domestic livestock (goats, sheep and pigs) are abundant (Gibson 1997). There are often conflicts between crop growers and livestock farmers in the district since animals are under a free grazing system. To resolve this problem, there is need for designating clearly which fields can be used for pasture and where to grow crops (Nsanje District Council, 2017).

With respect to commercial farming, there is only one estate called Kaombe in the District which is managed by Agricare Malawi. Mining is done on very low scale, which is confined to Traditional Authority (TA) Makoko where blue sulphur and corundum as well as limestone are mined.

The Agriculture Sector contributes over 80% of the District economy. The programmes within the sector fall into the following six broad areas: Crop Development, Livestock development, Irrigation Development, Extension Services, Land Resources and Conservation and Fisheries.

It should be noted that while the soil may be suitable for agriculture, inadequate rainfall often renders the soil unproductive under rain-fed agriculture. Although about 28% of the arable land in the District is idle, the households travel long distances to their gardens. This is attributed to floods as most of the villages have shifted to upper areas that are not affected by the floods while maintaining the fertile but distant floodplains as their gardens. However, high travel time has a negative effect on productivity since the households reach the gardens tired by walking.

Hall-Martin (1974) indicated that the Lower Shire Valley was probably inhabited between 10,000 and 35,000 years ago. Due to its fertility, it has probably supported high densities of people since the introduction of agriculture at the start of the Iron Age some 2,000 years ago (Bell 1984). Nurse (1972) noted that the Shire Valley was for a long period (1600-1850 AD) a focal area for the Maravi Kingdom which, at one point (about 1650 AD) extended from the Luangwa and Zambezi Valleys to the Indian Ocean. Schofeleers (1972) suggested that in the latter period the Maravi Kingdom became divided between a northern section ruled by the Kalongas around the shores of Lake Malawi who retained the name Maravi, and a southern section ruled by Kaphwiti under the name Mang'anja. During the 18th century, Maravi power declined as Portuguese influence increased and Yao and Arab slavers took a toll on the human population.

In the 19th century, there was a decrease in cultivation leading to a corresponding increase in wildlife populations. However, Sherry and Ridgeway (1984) stated that the human influence on wildlife remained strong and wildlife distribution was not continuous.

Since proclamation, there has been a varying degree of conflict with neighbouring communities, emanating from the MMPAC in the form of crop and stock raiding animals, and from the neighbours in the illegal use of resources in the MMPAC. The uncontrolled exploitation of resources, including trees, grasses, fruits and other plant products and large mammals, is accompanied by random and extensive burning. With a seriously reduced budget, accompanied by inadequate staff supervision and lowered morale, the situation is close to being out of control and effort is required to correct it (ULG, 2001).

1.8 Wealth Ranking in the Impact Area

Nsanje District Council (2017) came up with criteria to rank every village. Every village had its own ranking criteria to come up with four wealth categories. The criteria were based on what different households own. The following are wealth categories and their criteria:

Better off: These are people who use oil for cooking, use soap when taking a bath, they have livestock like cattle and goats, dress well, have iron sheets roofed houses, enough food for the whole year (taking three meals a day), employ others, drink tea every day and go to private hospitals and schools.

Average: These are people who have livestock like goats and chickens, have food which can last them 10 months (taking three meals a day), use oil for cooking, drink tea and use soap when bathing.

Poor: These are people who do not have enough food (taking one or two meals a day), they do not often use soap, they do not have enough clothes and they go out for piece work.

Very poor: These are people who depend on piece work for their income, do not have enough food for their daily meals (take one or no meals a day) and they do not have enough clothes.

Figure 6 below shows the four main ranking categories and their percentages;

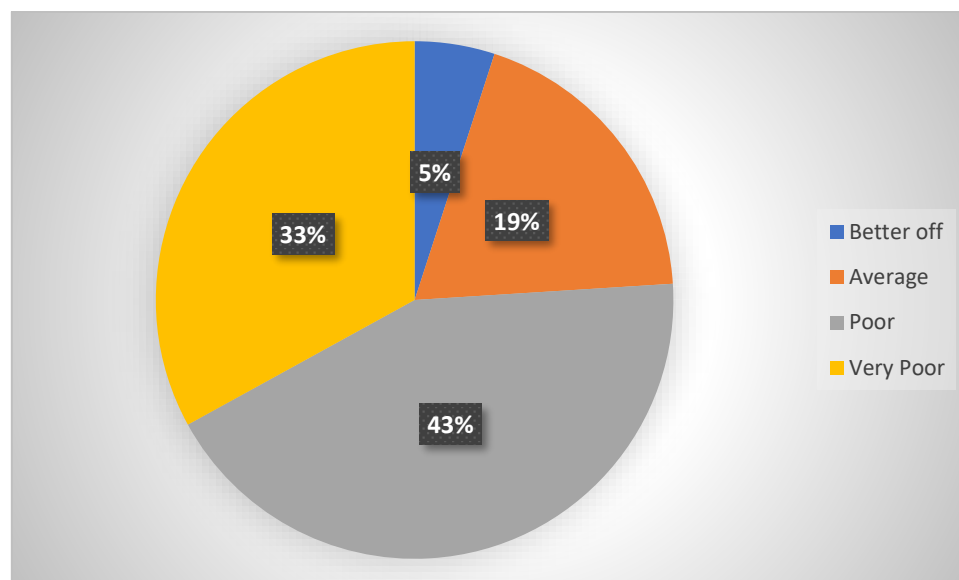


Figure 6:Wealth ranking graph

From the above figure, it is noted that most people (43 %) were poor. The better off category (best category) had only 5 %.

1.9 Source of Income

Fauna and flora have attributes which provide a number of benefits to man. In MMPAC impact area, all species of wild animals, ranging from insects through reptiles, rodents to large mammals, are acceptable as a food resource as well as for income (Nsanje District Council, 2013). In addition, forestry products and other forms of biodiversity play a vital role in generation of income levels at household level. Figure 7 below shows activities being undertaken by communities around MMPAC to source income for their livelihoods.

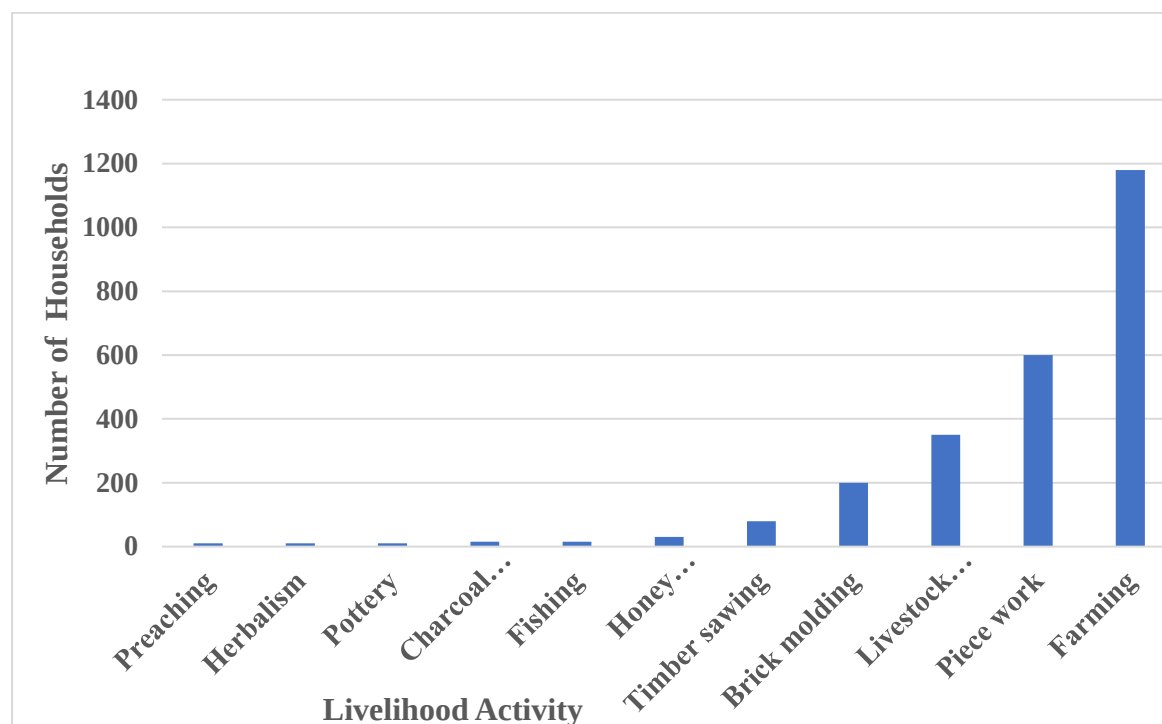


Figure 7: Number of households per livelihood activity

Figure 6 above shows the eleven livelihood sources on which households depend. Of the sources, the most relied upon is farming, seconded by piecework, livestock selling, brick molding and timber sawing. The remaining livelihood sources seem to be less relied on.

1.10 Land Tenure System

Land tenure in the district is under three categories: public, private and customary. Total land area for the district is 1,942 Km² (193, 132 hectares). Figure 8 shows that over 65% of land in the District is customary land while public and private land constitutes 20% and 15% of the land, respectively.

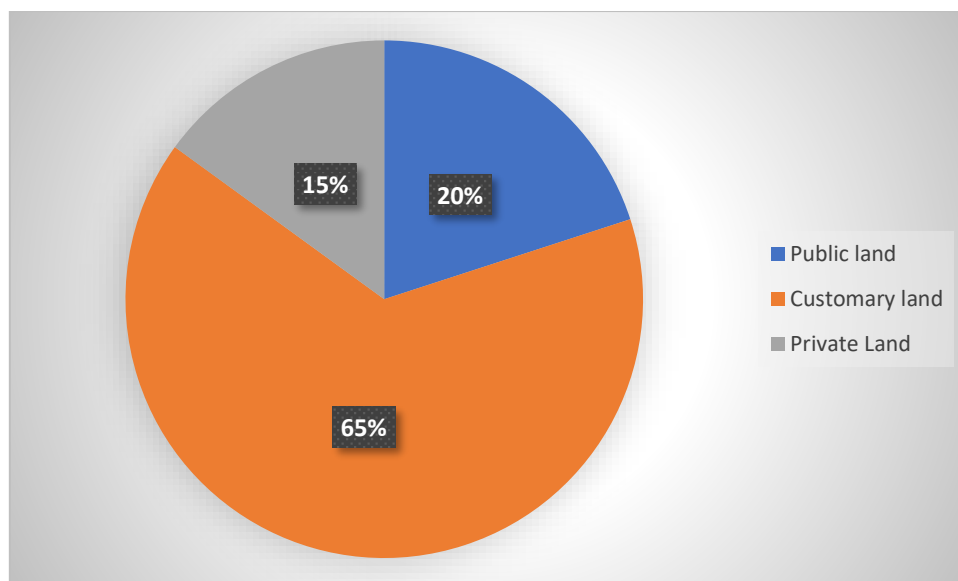


Figure 8: Categories of land tenure

Land surrounding MMPAC is mainly used for farming, settlement, grazing of animals, natural and planted forests (Nsanje District Council, 2017). Mining occurs at a very low scale, which is confined to the Malemia region where corundum is mined. Quarry mining is also being undertaken within Matandwe FR and along the periphery of the reserve especially at GVH Mwanda and Mbangu. Most of the land is used for subsistence agriculture. There is a private estate farm neighbouring MMPAC which is the Kaombe farm managed by Agricane Malawi Ltd. Animals in the MMPAC are free to roam to graze which has, in some instances, resulted in the destruction of crops.

The MMPAC borders Mozambique on the western side, and to the eastern side is the Shire River which also makes boundary between Malawi and Mozambique. There is little written history of the area before colonial times. Early explorers visited this part of Malawi along major trade routes from Mozambique through the Shire River. The predominant tribes in Nsanje are Sena and Mang`anja. The Mang`anja are the majority and make up to 60% of the population. They are of Chewa origin. The Sena who make up 30% of the district population migrated from Mozambique. The remaining 10% is made up of such tribes as the Azimba, and the Amwenye. Some people believe in a spiritual father known as M'bona. According to this belief, M'bona resided in Khulubvi Forest where two shrines have been constructed, one for M'bona himself and the other for his wife (Salima) who is usually an old woman who takes care of M'bona. The people pray to M'bona for rains during drought, outbreak of peculiar diseases and pests for animals and plague for human beings.

The uncontrolled exploitation of resources, such as trees, grasses, reeds and other plant products, large mammals and fish, is accompanied by random and extensive burning. With a significantly reduced budget, accompanied by inadequate staff supervision and lowered

morale, the management situation is close to being out of control and determined effort is required to correct it.

1.11 Economic Context

MMPAC is well situated in relation to Malawi's commercial city, Blantyre, to attract both local urban visitors and international tourists. However, access is severely limited by poor road conditions and restricted game viewing opportunities due to limited wild animal numbers.

Visitor numbers are very low, averaging around 38 per year, which does not generate a great deal of money, particularly in the context of income sharing with local communities (Nsanje District Council, 2017).

Most of MMPAC staff members are local neighbours. The permanent work force is relatively small and with current financial restrictions, the opportunities for temporary employment have diminished.

Use of natural resources from the MMPAC does generate considerable income locally. However, most of this use is illegal and is not sustainable. Sustainable use of resources will result in a reduction in this income, although this could be overcome to some extent by entrepreneurial organisation in the communities.

There is potential for further income generation (tour guiding, employment, small scale businesses) and all of these must be explored in an effort to involve local people in deriving benefit from the MMPAC as well as augmenting management funds.

In the macro-economic context, if MMPAC can be established as an attractive tourist destination (potential for specialised ecotourism) it will contribute to the overall tourism potential of Malawi, with the accompanying multiplier effect.

2. IMP process, principles and constraints

2.1 The IMP Process

The full team (FT) for the preparation of the IMP had a meeting in Thyolo on 2nd and 3rd June 2020. The meeting focused on the similarities and differences in the management approaches for the two protected areas. The major difference was the community involvement in that Matandwe FR is divided into co-management blocks leaving no core zone for wildlife, while Mwabvi WR uses law enforcement. Collection use of approved natural resources use only occurs on the periphery of the reserve in a 5-kilometer zone. The FT observed that managing the two reserves as a single entity is a policy matter and sought approval of the directors of DNPW and DoF for the development of IMP. The two directly approved development of an

Nsanje District Forestry Officer (DFO) organized an extraordinary meeting on 23rd July 2020 for the Local Forestry Board (LFB) for Matandwe FR attended by Traditional Authorities, Board members, Parks and Wildlife and District Council. LFP appreciated the need of IMP which would enhance law enforcement and protect Matandwe FR. From 1st December to 4th December 2020, FT conducted a workshop at Silver Hotel, Salima to examine the existing situation of the Matandwe-Mwabvi Protected Area Complex (MMPAC), determine the desired future situation and develop a framework for the Plan of Action for the IMP. The outputs for the four-day workshop were:

- Familiarization of the principles, constraints and the process of developing an IMP for the MMPAC;
- Appreciation of the concepts and review of management issues, outstanding resource values, purposes and significance for the IMP;
- Adopted the format of IMP as used by Liwonde- Mangochi Protected Area Complex;
- SWOT analysis for the Matandwe Forest Reserve and Mwabvi Wildlife Reserve
- Developed the vision, mission and objectives for the IMP; and
- Setting up of the Core Planning Team (CPT) and drawing up of the Terms of Reference for the CPT with the objectives of Revised Draft Matandwe-Mwabvi Protected Area Complex General Management Plans as well as final IMP (with workplan and budget) endorsed by stakeholders.

Members from the CPT were assigned sections of the IMP to draft from 12th to 19th February 2021 and were consolidated by Deputy Director Research and Development, the draft JIMP was circulated to members of FT for input.

Figure 9 describes, in a summary form, the process that was adopted by the DoF and DNPW in the development of the IMP for the MMPAC.

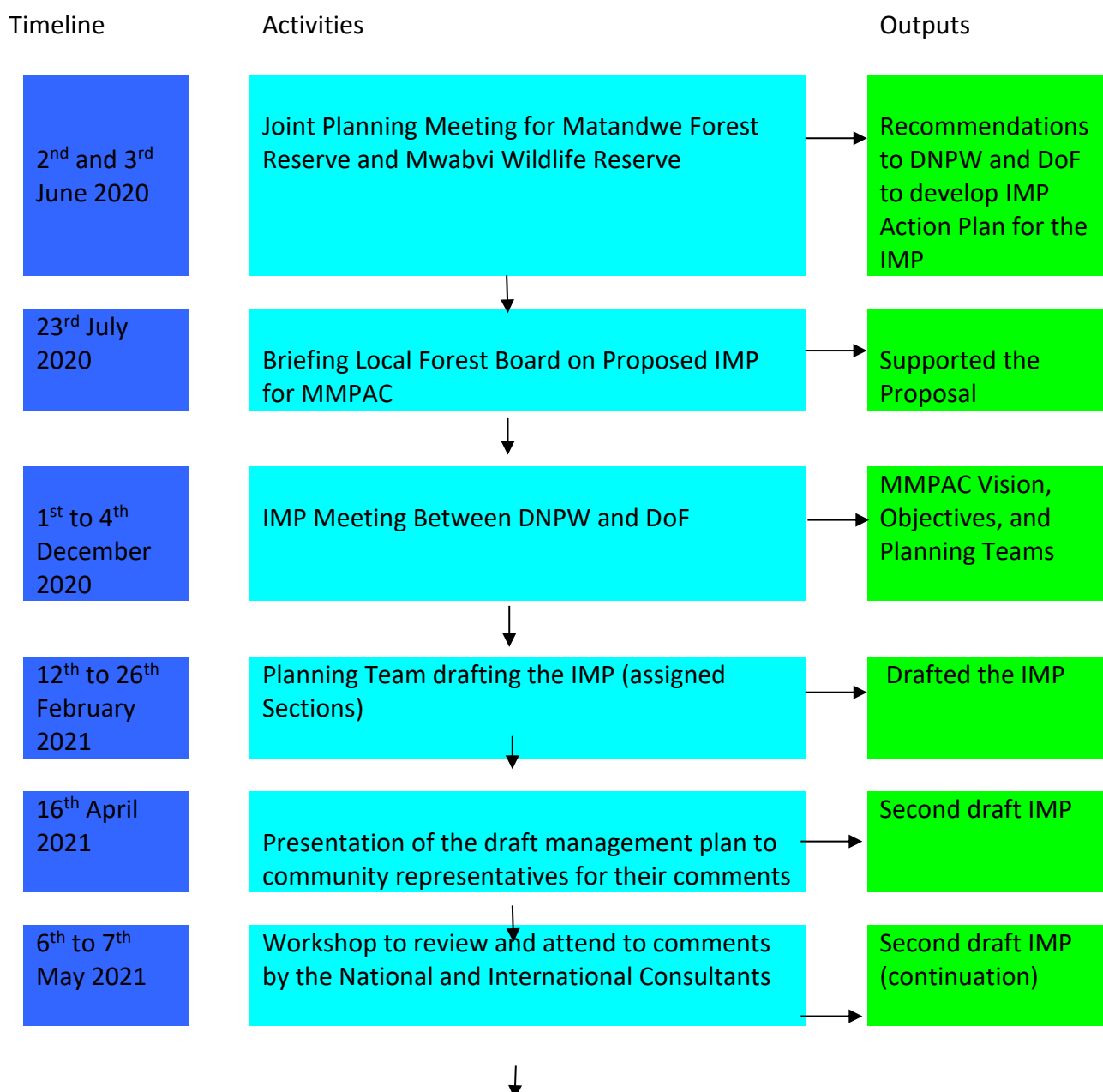


Figure 9: A summary of the process followed in developing the plan

2.2 The IMP Guiding Principles

At the very beginning of the development of an IMP, it was very important to lay out some key principles and concepts about the process of the developing and implementing the IMP. The Full Team and Core Team (planning teams) developed the following key principles in the development of the IMP.

2.2.1 Interdisciplinary planning teams

Many times, IMPs do not correspond to the reality and the specific needs, and the people who should use them do not see them as instruments to achieve an effective and efficient

management of protected areas (*Amend et al. 2003*). This is because a few technical people prepare the majority of these plans.

The Full Planning Team included the Environmental Safeguard Specialist and the Core Planning Team incorporated the Director of Planning and Development (DPD) for Nsanje.

2.2.2 Practical and Realistic IMP

A joint meeting between DoF and DNPW agreed to develop a plan that focuses on practical realistic issues and the challenges that are facing MMPAC. The joint meeting agreed to develop a realistic vision and actions that would be jointly implemented by the DoF and DNPW. “Practical” meant a document that could be implemented and the objectives of the IMP achieved by the MMPAC management using the current and potential expertise, physical and financial resources. Also, all implementation risks were to be mitigated through the IMP planning process.

2.2.3 Involvement of the public

Key to successful implementation of the IMP is to involve those interests directly or indirectly affected by a protected area (local communities, district governments, tour operators, etc.). At key points in the IMP process, opportunities were provided for the public at international, national, regional, and local levels to voice concerns about the planning and management of MMPAC. These opportunities for public participation included meetings, informal work sessions on particular issues, surveys and review and comment on IMP drafts.

2.2.4 Interactive approach

The planning process that was being used was based on an interactive approach through a series of meetings and workshops as summarized in figure 8 above to ensure consideration of a broad range of views and experiences.

A Nominal Group Process (NGP) was used throughout the planning process in order to enhance interactions. NGP helped stakeholders with differing opinions and backgrounds to reach consensus on MMPAC contentious issues.

2.2.5 Ownership of the IMP

In order to guarantee effective implementation of the IMP, the managers of MMPAC must feel that they own the IMP. Unless the ownership is made certain, implementation of the IMP will not be possible. The MMPAC managers throughout the IMP process enhanced their ownership of the IMP through efficient and effective interactions.

2.2.6 Respecting institutional, legal and policy differences

The Full Planning Team meeting for DoF and DNPW agreed to develop an IMP that respected and took into consideration the legal and policy differences between the two departments.

2.2.7 Integration of regional issues

During preparation of a general management plan, it was important to recognize that MMPAC management and resource protection issues were not always confined to protected area boundaries. Because MMPAC boundaries did not necessarily include all natural, ecological and scenic resources that relate to its purposes and significance, the activities on adjacent lands would have significantly affected its resources and programs. In addition, the activities of MMPAC would have affected land uses outside its boundaries. The strategic planning methods used in the process of developing the IMP considered the MMPAC within the broader context of the surrounding region, called attention to and addressed adjacent land uses that influence MMPAC resources, and generally better integrated the MMPAC into its regional environment.

2.3 The IMP constraints and implementation process

Before defining the specific management objectives for protected area, the constraints on its management should be identified, as should any other major threats to the area's values (Thomas & Middleton, 2003). Constraints may take different forms such as legal obligations, constraints of tenure, prior usage of land, health and safety considerations, managerial constraints, obligations to neighbours and visitors, international obligations and other policy considerations.

The planning teams recognised and considered the constraints to the development and subsequent implementation of the IMP. Two parallel administrations, differences in law enforcement capabilities, differences in the levels of funding, legal and policy framework differences and ecological differences between the two areas were identified as major planning constraints. The Chapter on Plan of Action has proposed mechanisms that would reduce the adverse effects of these limitations. These mechanisms would minimize the risks and threats that may lead to failure to implement the IMP.

2.3.1 Parallel administration

The MWR is under the DNPW. The DNPW is administered through the National Parks Policy and Act. The MWR Managers report to the Director of DNPW. On the other hand, the MFR is administered through the DoF, Forestry Policy and Act. The MFR management reports to the

Director of DoF on all strategic and operational matters. This parallel administration might constrain the decision-making practice on matters pertaining to the MMPAC

2.3.2 Funding mechanisms and levels

The MWR receives funding from DNPW and donors. The majority of funds for the MWR come from GoM. MFR receives its funding from the DoF and donors. MMPAC stakeholders perceived that both PAs are underfunded. Differences in the levels of funding or inequitable funding would constrain the implementation of the IMP.

2.3.3 Policy frameworks

MFR management is guided and administered under the National Forestry Policy (1996). The goal of the policy is to sustain the contribution of the national forestry resources to the uplifting of the quality of life in the country by conserving the resources for the benefit of the nation. Policy objectives and guiding principles indicate that Forest Reserves were created primarily for the protection of specific areas of forests where other forms of land use would be environmentally harmful. It is the government's overriding policy objective that these areas remain under forest cover in order to maintain their essential environmental services. A second policy objective, having regard to the national deficit in forest products, is to develop the Forest Reserves for productive purposes, to the extent that this is compatible with the primary objective. The conservation of biological diversity and aesthetic resources are also retained as policy objectives in special cases.

However, there are some very significant differences between the Forestry and Parks policies. Forestry Policy advocates sustainable consumptive utilisation of forest products by the general public. On the other hand, Parks Policy emphasizes that park resources are to be used non-consumptively e.g. by Tourism.

There is noted emphasis of intention to collaborate with the Ministry of Agriculture in the Forestry Policy, whereas Parks Policy emphasises beneficial relationship with natural resources management agencies, for example, Fisheries, Forestry, Water Lands, Agriculture, etc.

There is no mention of wild fauna management in the Forestry Policy. Neither is there mention of protection of endangered or endemic wild fauna. This is a grand omission in the Forestry Policy. The Parks Policy considers fauna and flora as wildlife and, therefore, provides equal protection to plants and animals.

The Forestry Policy is silent on wetlands. The Parks Policy advocates wetlands management in conjunction with relevant agencies. The differences in policy therefore suffice to indicate

the constraints that are likely to be faced by the MMPAC management during the implementation of the IMP.

2.3.4 Legal frameworks

Every Protected Area operates under a legal framework and an established national policy that must be recognized by the actors that are related to the area (Amend *et al.* 2003). MMPAC protected area planning is no exception to this requirement.

The Matandwe FR was established under the auspices of the Forestry Act whilst the Mwabvi WR is legally administered through the National Parks Act. There are a number of activities that are permitted on one side of MMPAC and restricted on the other side. For instance, Forestry Act allows for livestock grazing inside the MFR and National Parks Act does not sanction this. Legal differences would constrain implementation of certain proposals in the IMP.

3. Existing situations of the MMPAC

The chapter describes the assessment of the current situation and conditions of the MMPAC in terms of:

- Existing problems, issues and concerns;
- Current Strengths, Weaknesses, Opportunities and Threats (SWOT Analysis);
- Outstanding natural resources and values; and
- Purposes and significance.

3.1 Problem, issues and concerns

Problems were defined as existing negative situations facing the MMPAC, and the planning teams identified the following major issues affecting the effective conservation and management of the protected areas:

- a) Capacity constraints (inadequate protected area management and ecotourism infrastructure facilities and equipment, inadequate funding for management, inadequate capacity to enforce the existing laws);
- b) Illegal activities (poaching, logging, settlements/encroachment, cultivation, charcoal production, mining, bush fires);
- c) Inadequate community participation in conservation;
- d) High human population density around MMPAC;
- e) High poverty levels of the surrounding community;
- f) Weak collaboration and coordination amongst stakeholders;
- g) Inadequate information about the protected area's natural and cultural resources; and
- h) Unsustainable land uses outside the protected area boundaries.

These problems formed the important foundation for the development of strategic objectives, the management zone scheme and the plan of action.

Besides the 8 general problems highlighted above, theme specific challenges were identified for natural resources, tourism and revenue, administration and operations and human-wildlife conflicts. The sections below provide further details.

3.1.1 Natural Resources

3.1.1.1 Poaching

Illegal harvesting of plant and animals in the two protected areas is evident. The main target is small antelopes and the Buffalo. Use of gin traps which is the major threat to MMPAC is evident in both protected areas. Protected hardwoods are the most affected plant species, particularly Mopane species which are targeted for charcoal production and other species for timber. Figure 10 below shows some poaching incidents.



Figure 10: Timber sawing (L) and Poachers arrested for killing a Buffalo (R)

3.1.1.2 Wildfires or uncontrolled fires

Poachers, tourists or park and management staff all cause wildfires in the MMPAC. Also local people may accidentally or intentionally create wildfires in the MMPAC during the preparations of their farms. Wildfires affect mostly the woody vegetation and creeping wildlife species of the MMPAC. The Mopane woodland, which is a dominant vegetation type in the MMPAC, is very susceptible to fires, and any fire, early or late in dense grassland is likely

to burn and kill the Mopane seedlings (Bhima & Bredenkamp, 1999). Figure 11 and Figure 12 depict some fire incidences in Matandwe forest reserve.



Figure 11: Bush fires (L) and encroachment (R) in Matandwe Forest Reserve

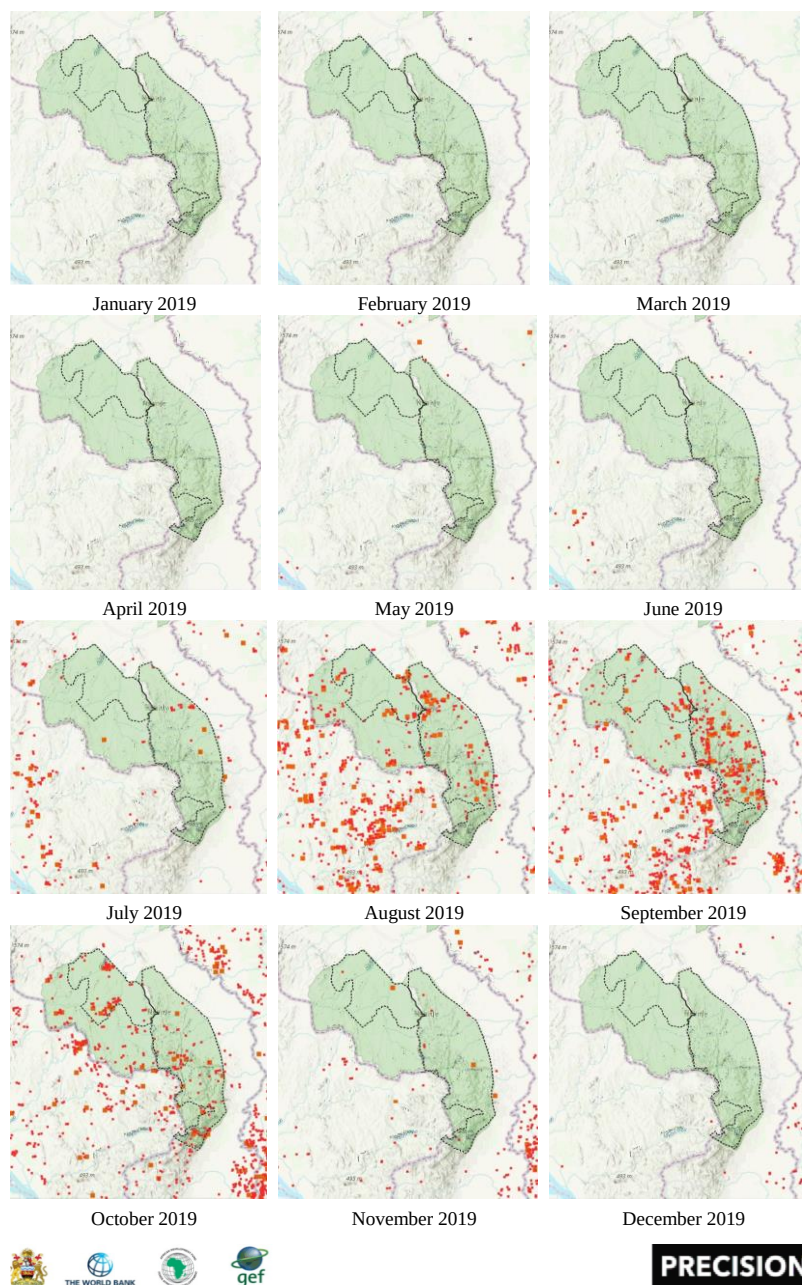


Figure 12: Monthly incidences of fires in Mwabvi-Matandwe Protected Area Complex

3.1.1.3 Declining populations of certain plant and animal species and subsequent local extinctions

The Major causes of population decline for both plants and animals, (and in some cases subsequent local extinction) are poaching and habitat loss. The continued loss of plant and animal species would reduce ecological and tourism values of the MMPAC.

3.1.1.4 Inadequate information about the protected area's natural resources

Data on natural resources, population trends, socio-economic and demographic data, water quality and quantity, sedimentation and siltation levels and other ecological information is inadequate. There has been little research conducted in the Mwabvi Wildlife Reserve which was mainly for academic purposes, thus providing little information to assist the reserve in making management decisions. Current management decisions are made without a full understanding of the extent of, and threats to, ecological processes.

Matandwe FR is understudied and little information is available regarding the state of natural resources. Dowsett-Lemaire, et al. (2006) stated that much of the reserve had been degraded and encroached upon for many years or replaced by *Toona ciliata* plantation (Red Cedar). Dowsett-Lemaire gave an example of where Gorgeous Bushshrike (*Malaconotus viridis*) was once collected in the thicket on the Chididi stream above Nsanje but the bird was no longer in existence when the area was visited again in 1983. The reserve is however, visited by mammals from Mwabvi Wildlife Reserve during periods of dryness. The populations of these mammals need to be established.

De Beenhouwer M, et. al. (2019) conducted a survey in Matandwe Forest Reserve in 2019 and produced a list of wildlife species as shown below. He however, pointed out that since sampling was conducted during the European summer, no migratory birds were observed. A detailed report of their survey can be found at <https://www.BINCO.eu>.

3.1.2 Tourism and Revenue

3.1.2.1 Poor visitor services

There is an overall lack of visitor information, interpretive materials, and visitor use opportunities in the MMPAC. To resolve this problem, a website, embedded within the current DNPW, will be created and linked to other websites including that of the Department of Tourism. The visitor contact station at the entrance gate area on the MWR side is small and very outdated. There is no visitor entrance gate on the side of the Matandwe FR. Very little information on MMPAC resources is available to visitors. There is no on-site interpretation and few opportunities for visitors to get out of their vehicles. There are inadequate resources for supplying information to visitors, including a total absence of suitable printed leaflets giving information about MMPAC regulations, maps of game viewing circuits, and current information about the status of various routes, specific points of interest, etc. Information and interpretive materials are an important means of stimulating visitors' interest and promoting their understanding of a protected area thus making the visit more enjoyable and instilling a sense of responsibility for conserving the area. Many of the protected area's severe problems such as adequate disposal of trash, littering, and proper use of toilet facilities can be linked directly to a lack of understanding and the sense of responsibility. These problems are compounded by lack of access to essential visitor

attractions due to poor road network and conditions (Figure 13). Also, MFR and MWR are not fully exploited for visitor use and development.



Figure 13: Poor Road conditions and network

3.1.2.2 *Inadequate funding for management*

Mwabvi Wildlife Reserve and Matandwe Forest Reserve rely heavily on funding from Central Government through Other Recurrent Transactions (ORT) funding, Development fund and Treasury fund (TF). However, some donors fund the reserves through initiated projects. The funding from Government is so limited and comes in drops. All the collections from the protected areas go to the central Government, before the Treasury releases some of it back to the MPAC through the respective departments. Furthermore, the Headquarters (DNPW and DoF) control funds for managing MMPAC. Release is untimely and inadequate, in some cases.

Other issues relating to inadequate funding for MMPAC management include:

- Lack of tour operators, thus denying MMPAC concession fees;
- Inadequate financing mechanisms by the MMPAC deny the protected areas revenue for management;
- Low visitor numbers averaging 38 per year;.
- Hard logistics to start Retention Scheme for the MMPAC

3.1.3 Protected Area Management

3.1.3.1 Inadequate capacity to enforce the existing laws

The amount of illegal activities has increased as a result of some political and community pressures, due to the increase in the amount of illegal weapons in local communities and as a result of poverty in local community areas. The problems are further compounded by inadequate numbers of staff, equipment and skills by the MMPAC authority to enforce the existing legislation.

3.1.3.2 Poor infrastructure, facilities and equipment

Roads, housing, and offices are inadequate for efficient and effective protected area and human resources management. Also housing and offices are in appalling condition and poorly designed to meet the contemporary protected area management challenges.

Working facilities and equipment, including uniforms, are usually in poor condition since they are inadequate in most cases. This reduces efficiency and effectiveness of the MMPAC operations. Vehicles are inadequate, in bad condition or inappropriate for the management operations. Also there are no plans to replace or maintain working facilities and equipment.

The road network and road conditions in MMPAC have deteriorated considerably due to infrequent grading and maintenance. Ability to supervise and monitor management ability is hampered by deteriorating road conditions and an inadequate road network.

3.1.3.3 Low staff morale

Poor remuneration, few opportunities for professional advancement, inadequate accommodation, uniforms, vehicles and other working facilities/equipment are all causes of poor staff morale. Coupled with inadequate social amenities, this affects morale of MMPAC staff.

3.1.3.4 Resistance to change by the protected area staff

Any change has initial costs. Protected area staff resists changes that delay protected area development.

3.1.3.5 Inadequate staff numbers and skills

There is an inadequate number of staff to manage the MMPAC. MWR has 21 staff including 3 hunters and 1 security guard, and this number is perceived to be inadequate. Staff replacement is slow or absent in some cases, and this makes the position worse.

Only 8 staff for the Matandwe FR have received formal training in resource protection. Skills, knowledge and attitudes of staff are inadequate to effectively and efficiently manage the protected areas. Few senior and junior staff of MMPAC have received training in either the theoretical or the practical aspects of their work. Most MMPAC staff have little knowledge or understanding about the protected area resources, conservation practices, resource protection strategies, etc.

Poor work culture and ethics is evident in MMPAC staff which affects their effectiveness and efficiency,

3.1.3.6 Poor boundary maintenance

MMPAC has no clear boundary line or permanent markings/beacons. This creates opportunities for encroachment and settlements such as in GVH Mthumba, Saini, Mchacha, Mthepeya, Nthondo, Mzondola, Nguluwe and Chadzuka in TAs Mbenje, Malemia and Tengani. Due to poor boundary maintenance, property damage by wildlife is inevitable. These are exacerbated by limited funding and low manpower.

3.1.3.7 Different management philosophies for ecologically connected areas

Legislation, policies and authorities that govern the management of Matandwe FR and Mwabvi WR are different. However, these two areas are ecologically connected. Local communities get confused with the differences in resource use restrictions. Also funding and staff levels are different in two areas, this might create differences in levels of resource protection hence affect both areas in the end. Also due to differences in management philosophies, conflicts might arise. These conflicts might damage the resources that need to be protected. Management on the other side of the complex might frustrate management efforts by one party, if the management philosophies and subsequent management actions are different.

Also DOFDoF and DNPW have different administrative systems and structures and inadequate collaboration is considered as an obstacle to the management of these two protected areas. The development and implementation of a IMP is key to resolving differences in the philosophies of managing Matandwe FR and Mwabvi WR.

3.1.4 Human-Wildlife relations

In Matandwe forest reserve communities have persistently invaded the reserve for fuel wood collection, charcoal production, Pit sawing, mining and Colombo roots extraction (Figure 14) that has been directly in conflict with fauna in both Matandwe FR and Mwabvi GR. Communities adjacent to protected reserves live below the poverty line and for their survival, create pressure on protected areas, and hence conflicts. These further compounds the problem of poor relationships between MMPAC and local people.



Figure 14:Resource extraction from MMPAC by local people

3.1.4.1 Negative attitudes of people towards the protected areas

Property damage by wildlife and restrictions on the use of resources by authorities create negative attitudes. For example, 88% of those interviewed during the preparation of the IMP confirmed that they had experienced property damage, in one form or another, from wildlife. Furthermore, some GVHs had encroached on the reserve since its Gazettement such as GVH Nthondo in TA Tengani, Mchacha, Saini and Mthepeya in TA Malemia. Local communities due to their negative attitudes towards the MMPAC authorities do not support certain conservation initiatives. As the result there are persistent wildfires, and continuous destruction of fauna and flora in protected areas. Hostilities towards staff in protected areas are a result of negative attitudes of the neighbouring human communities (Nsanje DSOER, 2015).

The surrounding communities of the MMPAC still consider that they are the rightful owners of the land that accommodates the present MMPAC (Gunda, 2001). This brings about misunderstandings, conflicts and poaching which leads to the degradation of the protected area resources.

3.1.4.2 High human density around the protected areas

High human density around MMPAC creates pressure on protected areas resources. Protected area resources and arable land adjacent to the protected areas attract local communities, with encroachment and settlements on the edge and inside MMPAC. According to the 2018 Population and Housing Census projections, the number of people living in Nsanje is estimated at 437,892 with a growth rate of 2.1 which is lower than the national average and Southern Region growth rates of 2.9 and 2.7 respectively. Population sizes are increasing in Nsanje District as table 4 portrays. Population density for Nsanje is 154 persons per Km² which is lower than the national average of 186.

At Traditional Authority (TA) level, Mbenje had the highest human population in both 2018 and 2008 (Table 4). The least populated among the 4 TAs was Ngabu.

Table 4: Population of people surrounding MMPAC

TA/Area	2008	2018
Tengani	41,100	34,690
Mbenje	43,394	53,559
Malemia	18,033	22,437
Ngabu	11,146	13,381
Mwabvi	5,662	8,746
Nsanje Boma	20,179	26,179

Source: NSO (2019 and 2009)

3.1.4.3 Misconception of policies by local human communities

Local communities believe that Matandwe FR and Mwabvi WR are for the people of Malawi. They don't understand the reasons for being denied access to these protected areas.

3.1.4.4 Encroachment of people into the protected areas

The communities surrounding the protected areas depend highly on natural resources for community livelihood. However, due to overpopulation and limited land for cultivation, farmers have encroached on the catchments areas and cultivated along the riverbanks. This has accelerated land degradation hence reducing agriculture productivity. Again, due to climate change, the district is experiencing continuous floods and droughts hence putting pressure on the district council to provide food, shelter, clothes, and other basic materials to communities in order to sustain their community livelihoods. Furthermore, the Elephant and Dinde Marshes are wetlands in the area which are important sites for fishing, agriculture, hunting and the collection of natural resources for the livelihoods of local communities. However, there has been increasing pressure driven by a changing climate, population growth, rural poverty and agricultural conversion.

Figure 15 illustrates encroachment in Matandwe Forest Reserve



Figure 15: Encroachment in Matandwe Forest reserve

3.1.4.5 Inadequate support from human communities and higher political authorities

Illiteracy is rampant and lack of conservation knowledge is evident in neighbouring communities. This may create reluctance in communities in supporting conservation initiatives. Also, property damage by wildlife may lead to lack of support by communities. Resource use restrictions and inadequate access rights are also blamed for causing weak support from local communities. Lack of appreciation of protected area values by local communities and inadequate tangible shared benefits from protected areas to human communities prevents authorities from winning support from them.

3.1.4.6 Unsustainable land uses outside the boundaries

Poor farming practices coupled with land pressure, with an estimated holding of 0.4 ha/house hold by farmers surrounding the protected areas, has led to reduced crop productivity hence an over-reliance on natural resources for their livelihoods. This problem is compounded by the poverty of a rapidly growing largely cashless rural society in villages around protected areas in the District. In rural surrounding areas many people depend on trees as a source of energy, building materials and other uses. In customary land, many trees have been over-exploited. Now pressure is exerted on protected areas where people illegally harvest trees for firewood to be used domestically or for sale to get some income. Furthermore, environmental degradation has exacerbated climate change and induced flooding and droughts making communities vulnerable.

3.1.4.7 Political influence from the district authorities

Politicians, especially close to elections, give false promises to local communities. These promises make communities fail to support conservation efforts. Also, conservation efforts are adversely affected by the desires of politicians not to see poachers punished especially during or close to election dates. Politicians misinterpret democracy to mean people can do anything, including extracting natural resources from MMPAC. Politicians help to promote this misconception.

3.1.4.8 *Land* use conflicts

Lack of integrated and coordinated land use planning creates land use conflicts. There are perceived haphazard land uses and physical developments outside MMPAC. These developments have adverse effects on the MMPAC. Furthermore, the Elephant and Dinde Marshes are important for fishing, agriculture, hunting and the collection of natural resources for the livelihoods of local communities. However, there has been increasing pressure driven by a changing climate, population growth, rural poverty and agricultural conversion. The marshes are fed by the Shire River. However, there has been persistent conflict in resource use by communities and Departments of Parks and Wildlife and Fisheries.

3.1.4.9 *Protected* areas are unknown to potential customers and stakeholders

Conflicts with other stakeholders are evident partly due to lack of awareness of protected areas values and intentions. Low numbers of tourist may be due to lack of knowledge of what the protected areas can offer, including products aimed at tourists.

3.1.4.10 *HIV/AIDS* pandemic

Conservation in Malawi is in crisis due to a number of challenges. Issues of poverty, high population and more recently, HIV/AIDS, are hindering conservation. In Malawi, the number of people living with HIV/AIDS continues to increase. About 15.96% (800,000 people) of the people of Malawi are living with HIV/AIDS. About 70,000 AIDS related deaths were reported last year. The impact of the disease continues to threaten every economic sector in Malawi. HIV/AIDS has become a household name, demanding attention of not only the health sector, but also each and every development sector, including the conservation sector.

The District is implementing the National HIV and AIDS Strategy (2015-2022) which is aligned to the National HIV and AIDS Policy. The National HIV and AIDS Strategy overarching goal is to prevent further spread of HIV infection, promote access to treatment for PLHIV and mitigate the health, socio-economic and psychosocial impact of HIV and AIDS on individuals, families, communities and the nation. Specifically, the National HIV and AIDS Strategy seeks to ensure that 90% of PLHIV know their Status, 90% of known HIV positives are Initiated on ART (Anti-retroviral Therapy) and 90% of patients on ART are retained in care and adhere to ART. Effective HIV and AIDS management is, therefore, key towards ensuring healthy lives and promoting well-being for all ages in the District.

Nsanje District HIV prevalence in the adult population (age group 15 to 49 years) has dropped from 16.4% in 2010 to 11.2% in 2016. This is above a national HIV prevalence of 8.8%. Women shoulder the burden of HIV infections at 12.8% against 9.5% for men. This has led to increase in morbidity, mortality and orphan hood among citizens, thereby negatively affecting development and service delivery in the District (Nsanje SEP 2020).

The ability of the conservation sector to manage and protect the MMPAC is likely to be compromised. This is because the staff that comprise the MMPAC workforce include individuals being infected or affected by HIV/AIDS. The epidemic has created a host of new costs and management challenges for conservation managers and the MMPAC. Although very little direct research has been conducted, anecdotal evidence supported by a limited number of studies and evidence from other sectors seems to indicate a number of costs are now being experienced by the MMPAC.

The MMPAC workforce is comprised of a large, skilled and knowledgeable workforce. The work carried out by MMPAC staff is human or labour intensive with little scope for mechanisation. The skills held within the workforce are a combination of years of on-the-job training and experience and costly tertiary qualifications. In other words, it is the product of a major investment. Workers are both mobile and migrant. It is a specialised field in which potential employees may travel some distance to obtain employment. There is also short

distance migration as staffs live within the MMPAC, away from their families, during work shifts. This mobility and migration mean that staff spend much time away from their families, increasing the susceptibility to HIV infection.

3.2 SWOT Analysis

The Teams carried out Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of Matandwe Forest Reserve and Mwabvi Wildlife Reserve. SWOT analysis is one of the most important steps in the IMP process because it provides the reality of the issues affecting the management of the protected areas as well as their institutions and the external factors affecting them. Information from SWOT analysis was used to consolidate a section on issues, purposes and objectives.

3.2.1 Matandwe Forest Reserve

Strengths	Threats
➤ Availability of dedicated staff ➤ Availability of willing local institutions around Matandwe. ➤ Existing policy and legislation ➤ Biodiversity	➤ High population density around the FR (poaching, fuel wood) ➤ Illegal late hot wildfires caused by bordering communities due to overgrown boundaries and since early burning practices are rarely observed ➤ Cross boarder poaching and logging due to proximity to Mozambique border ➤ Rampant poverty ➤ Negative attitudes towards conservation by local communities ➤ Extreme climatic change ➤ Interference in conservation emanating from some politicians and local leaders
Weaknesses	Opportunities
➤ Inadequate staff (prosecutors, trained staff) ➤ No infrastructure in the reserve (Staff houses, fire towers, roads) ➤ Inadequate ecological information ➤ Undefined boundary ➤ Low staff performance (low morale, lack of skills, inadequate funding) ➤ Illegal activities (charcoal production, settlements, cultivation, mining)	➤ Donor support ➤ Running vehicle ➤ Opportunity for ecotourism due to available Afro-Montane ecosystem ➤ Opportunity for benefit sharing by linking communities to markets of unique species/resources (<i>J. palmate</i>) ➤ Combined protected area. ➤ Community willingness ➤ Willingness by DNPW to work with FD ➤ Khulubvi Cultural heritage site

3.2.2 Mwabvi Wildlife Reserve

Strengths	Threats
➤ Mwabvi is better secured ➤ Unique natural habitat (Thickets, outcrops, terrain, Mopane woodlands and scenery) ➤ Existing basic park infrastructure at Migudu ranger camp ➤ Well established community structures at group village level ➤ Trained staff ➤ Updated legislation i.e. Policy and Act ➤ Availability of biodiversity e.g. Buffaloes, Mopane	➤ Persistent natural disasters e.g. draughts that lead to food insecurity ➤ Increasing human population
Weaknesses	Opportunities
➤ Inadequate road network in the reserve ➤ insufficient ranger camps to adequately cover the reserve ➤ Low animal populations and diversity ➤ Inaccessibility of the park during rainy season ➤ Poorly maintained houses ➤ Poor state of tourist facility ➤ Unclear boundary in some areas ➤ Inadequate community participation ➤ Illegal activities ➤ Low funding ➤ Sharing boundary with Matandwe Forest Reserve with different management system ➤ Public road within the reserve ➤ Absence of perennial water for wildlife/animals	➤ Interagency collaboration to combat wildlife crime (Police, Immigration, MDF, Judiciary, Forestry) ➤ Availability of partners (donors and NGO support) ➤ Possibility of reintroduction of some extinct animal species e.g. Black Rhino ➤ Community Engagement/NRCs e.g. communities managed to arrest Buffalo poacher ➤ It is practically manageable because of its size and shape ➤ Carbon sequestration (payment for ecosystem services)

3.3 Outstanding resources and values

In any protected area there are many important resources and values. For planning purposes, the DNPW and DoF Planning Teams agreed to focus on what were termed as outstanding resource values. The term “outstanding” was used to mean extraordinary, exceptional or unique. Outstanding resource values were defined as resources that capture the essence of why the protected areas were created and exist, because they helped maintain the integrity of the protected areas system. These could be intangible or tangible resources. These resources are not limited to the boundaries of protected areas. Due to limitations in resources (time, staff and finances), protected areas needed a management priority for protecting natural and cultural resources.

The following criteria were developed and used in the identification of outstanding resources and values for the protected areas:

- Unique biological attributes, vegetation types and land forms;
- Rare, endemic, endangered, threatened plants and animals;
- Sensitive biological and physical resources;
- Major cultural, historical and archaeological sites; and
- Resources with worldwide recognition.

Experiences of planning team members, survey information and existing documents on the two protected areas were major sources of information in the identification of the following outstanding resources values of the MMPAC.

4. Vision, Mission and Management Objectives

The vision, mission and management objectives define the desired future of the MMPAC in light of the current issues and challenges affecting the effective conservation and management of biodiversity. The defined desired future of the MMPAC reflects the issues, outstanding resource values, the purposes and significance.

4.1 Vision

An integrated, well managed and self-financing landscape of Mwabvi WR and Matandwe FR in which biodiversity is protected, essential ecological processes are sustained, and the surrounding communities and other stakeholders fully support and realistically benefit from conservation efforts.

4.2 Mission

Protecting and managing the biodiversity through improved law enforcement, monitoring and stakeholder involvement, in order to reduce illegal activities, improve livelihoods and attract more tourists.

4.3 Management objectives and indicators

4.3.1 Protected area management

1. To reduce illegal activities in MMPAC
2. Strengthen law enforcement capacity to combat illegal activities in PA
3. To improve protected area management and ecotourism infrastructure facilities and equipment
4. To adequately monitor biodiversity for efficient management of the MMPAC

5. To strengthen collaboration and coordination amongst stakeholders on PA management
6. Improve habitat management

4.3.2 Community

1. To improve capacity to manage and regulate community resource use programs
2. To build capacity and improve community support and participation in sustainable management of natural resources
3. To improve livelihoods for local communities through facilitating and promoting sustainable IGA's and conservation-based investments

4.3.3 Generalized Performance Indicators for the MMPAC

1. Improve woodland cover
2. Increase in number of tourists
3. Increase in animal populations
4. Increase in revenue generation
5. Number of Community Based IGAs
6. Increase in number of animal population/sighted
7. Decrease in illegal activities
8. Decrease in wildlife-human conflict
9. Number of IGAs by communities

5. Management Zone Scheme

5.1 What is management zoning?

In the context of protected area management, the use of Management Zoning is used to best resolve existing problems facing the Mwabvi-Matandwe protected area complex, to protect resource values, and to accomplish management objectives by defining what can and what cannot be implemented in different areas of the protected area. The differences in the types and levels of land use, as well as the types and levels of physical development, distinguish one management zone from another.

5.2 Development of management zone scheme

No scientifically proven formula was used in the development of the management zone scheme. Stakeholders and technical staff of the Mwabvi-Matandwe used best available information, professional judgements and their experiences in determining the appropriate zoning scheme for the Mwabvi-Matandwe.

Combinations of the following outlay maps were used in defining management zones that would best address problems facing the Mwabvi-Matandwe and accomplish defined management objectives:

- Problem and opportunity area map;
- Vegetation map;
- Physical features map; and
- Existing administrative facilities and pattern of use map.

Land use capability and suitability to support different types and levels of use and physical developments was an important determinant of the management zone scheme. Locations of existing facilities, existing patterns of use and existing resource conditions did not necessarily influence the process of developing the management zone scheme.

5.3 Criteria for the management zone scheme

The zoning designations defined in this management plan are based on different management emphases. During the development of the management zone scheme, primary consideration was given but not limited to the following criteria:

- An approach that would integrate the management of Mwabvi and Matandwe protected areas
- Practical Management Zones;
- Introduction of uses and developments that minimizes existing management problems;
- Elimination of uses and developments that either damage protected area resources or create undue burden on Mwabvi-Matandwe management;
- Protection of outstanding resource values of the Mwabvi-Matandwe;
- Achieving Mwabvi-Matandwe purposes and enhance its significance;
- Constraints imposed by landscape and ecological determinants;
- Provision of diverse range of appropriate visitor experiences;
- Zone scheme that would increase revenue of the Mwabvi-Matandwe; and rationalise expenditures for self-financing;
- Land/environmental capability and suitability to support proposed or existing use and physical developments;
- Use of already impacted areas and resources; and
- Increased contribution to local economies and enhancement of Mwabvi-Matandwe community relations.

5.4 Management zone scheme for the Mwabvi-Matandwe

The following five management zones were proposed for the Mwabvi-Matandwe

- Wilderness Zone (WZ);
- Semi-Wilderness Zone (SWZ);
- Administrative Use Zone (AUZ);
- Visitor Development Zone (VDZ) and

- Co-management Zone.

Below is a description of each management zone of the five zones (Figure 16). Each description includes the following aspects:

- Description of specific boundary;
- Rationale or justification for each management zone;
- Outstanding resources and values for each management zone;
- Permissible activities and limits types and levels of uses and physical development that are acceptable in each management zone;
- Prohibited uses and physical developments in each management zone; and
- other necessary conditions for the implementation of each management zone.

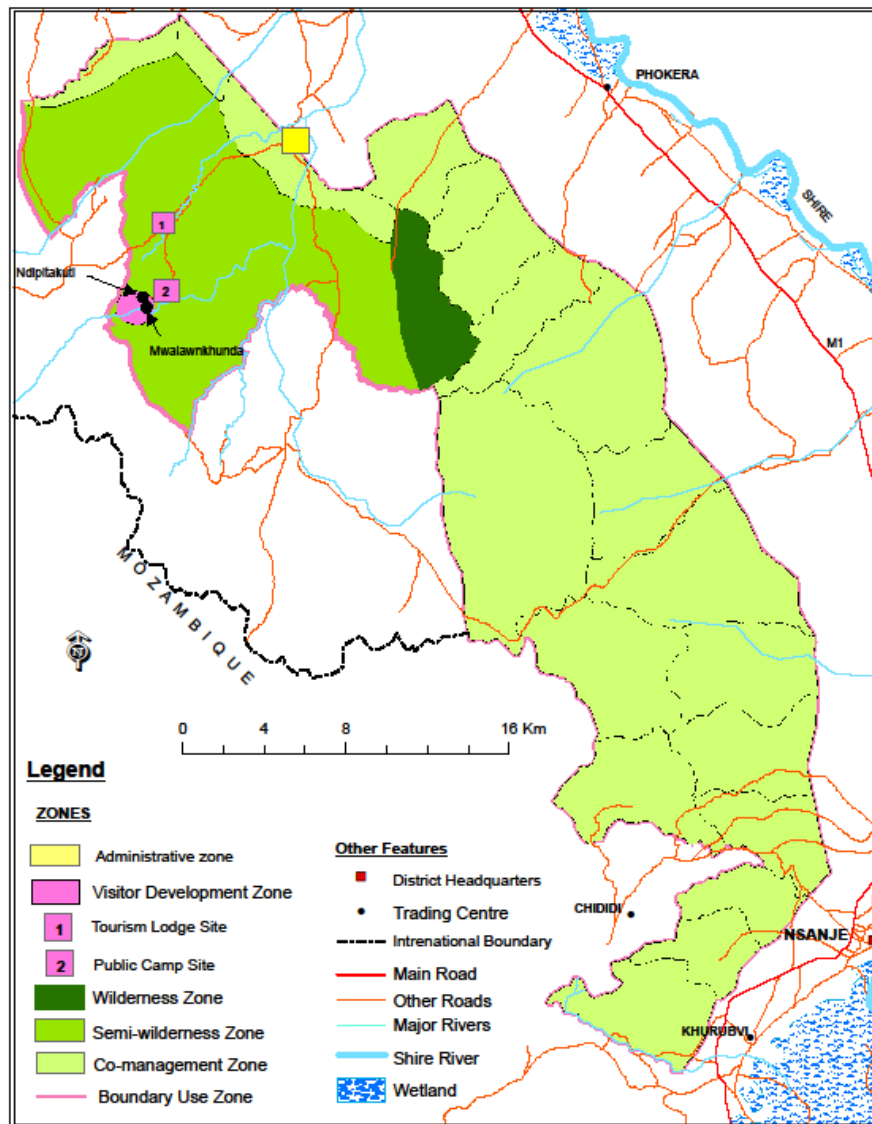


Figure 16: Map showing management zones in MMPAC

5.4.1 Wilderness Zone

<i>Boundary description</i>	The Eastern Uplands area is designated as a wilderness area. It starts from the source of Nanyoli stream to the north to the source of Namifula stream to the south.
<i>Rationale for the zone</i>	Protection, preservation of the river catchment area Thangazi, Namifula, Nyaminjale, Namikango and Nsaje rivers and the reptiles, birds and mammals that live there. Also, Protection, preservation of woodland, providing shelter and a breeding ground for large mammals. It serves as a passage for animals between Mwabvi and Matandwe.
<i>Resource values</i>	Important habitat for reptiles, mammals and birds. These are sites of cultural significance as historical part of Maravi Kingdom, Mbona Shrine.
<i>Permitted activities</i>	1. Research and ecological monitoring
	2. Law enforcement
<i>Prohibited activities (All Wilderness Areas)</i>	1. Night Game Drives
	2. Camping
	3. Harvest of natural resources
	4. Day Game Drive
<i>Other conditions (All Wilderness Areas)</i>	1. Indemnity form will be signed prior to undertaking any activity in this zone
	2. Booking system for any activity will be developed and implemented

5.4.2 Semi-wilderness zone

<i>Boundary description</i>	This zone comprises the remainder of the reserve apart from the small exclusions (Special Areas and Utility Areas) and the Resource Use Zones (which are compatible with the semi-wilderness character of this zone).
<i>Rationale for the zone</i>	Managed to maintain its aesthetic and ecological character while encouraging use by the public through ecotourism.
<i>Resource values</i>	Essential area for maintaining the courses of Thangazi, Lalanje, Dande and Mwabvi rivers. Important habitat for reptiles, mammals and birds. These are sites of cultural significance as historical part of Maravi Kingdom, Mbona Shrine.
<i>Permitted activities</i>	1. Research and ecological monitoring
	2. Law enforcement
	3. Night Game Drives
	2. Camping or cooking
	3. Harvest of natural resources
	4. Day Game Drive
<i>Other conditions (All Wilderness Areas)</i>	Indemnity form will be signed prior to undertaking any activity in this zone

5.4.3 Administrative zone

<i>Boundary description</i>	Facility located at the Main entrance gate to the Park, soon after crossing Nyambulabula stream. It includes all administrative road network. Migudu Camp, Mwabvi Headquarters, all Forest Guard Posts and Ranger Posts.
<i>Rationale for the zone</i>	Infrastructure for the administration and management of Mwabvi and Matandwe
<i>Resource values</i>	Buildings and infrastructure for administration and management
<i>Permitted activities</i>	1. Administration office
	2. Parade ground
	6. Ranger Posts
	7. Forest Guard Posts
	8. Main Gate
	9. Research and ecological monitoring
<i>Prohibited activities</i>	1. Staff Housing Development
	2. Health Clinic
	3. School
	4. Entertainments and sport events and facilities
<i>Other conditions</i>	Limited infrastructure expansion to be carried out in accordance with EIA.

5.4.4 Visitor development zone

<i>Boundary description</i>	This includes Njati Lodge, Migudu Camping Site and a proposed tourists' accommodation at areas, such as along the Central Dambo, which offers great potential for ecotourism development. At Njati this covers the current area under concession
<i>Rationale for the zone</i>	Provide unique tourist destination and diverse visitor uses, activities and accommodation. These investments and opportunities will be important sources of finance for the Mwabvi-Matandwe
<i>Resource values</i>	Wildlife values, aesthetics, cultural and historical values.
<i>Permitted activities</i>	Activity and/or physical developments
	1. Njati Lodge
	2. Migudu Camp
	3. Research and ecological monitoring
<i>Prohibited activities</i>	1. Discos
	2. Track and field sports
	3. Hunting
	4. Other activities as shall be stipulated in the Concession Agreement
<i>Other conditions</i>	1. Indemnity form to be signed prior to undertaking any activity in the zone
	2. Conditions attached to the Concession Agreement must be adhered to by the Concessionaires

5.4.5 Co-management Zone

<i>Boundary description</i>	For Mwabvi Wildlife Reserve, a co-management zone is essentially a resource use zone which is a 5-kilometer stretch around the reserve. For Matandwe, co-management zone is the whole reserve but harvesting of approved natural resources will also occur within 5-kilometer stretch.
<i>Rationale for the zone</i>	For both Mwabvi Wildlife Reserve and Matandwe Forest Reserve, the 5-kilometer stretch protects the reserves against all forms of illegal incidences.
<i>Resource values</i>	An area essential for collection of approved natural resources by surrounding communities.
<i>Permitted activities</i>	1. Research and ecological monitoring
	2. Law enforcement
	3. Night Game Drives
	2. Camping or cooking
	3. Harvest of natural resources
	4. Day Game Drive

5.5 Identification of zone boundaries on the ground

Boundary Use Zone would be cleared for easy identification and implementation of activities related to the zones. Physical features clearly mark other management zones.

6. Plan of Action

This section outlines major IMP activities i.e. strategic activities with significant contribution to the vision and mission of MMPAC. The MMPAC Management shall continue to identify strategic activities as the implementation of the IMP unfolds and as circumstances demand through the adaptive management approach. Routine operations and other activities relevant to the IMP issues and objectives shall be identified or improved continuously through the development and implementation of Annual Operation Plans and Budgets (AOPB).

The planning teams considered and included actions that would be feasible within the DNPW and DoF set-up and their policy and legal frameworks. Also, the planning teams described the activities in terms of what needs to be done, how should that be done and who should do it. Timing for each activity and reasons are briefly outlined in this chapter.

6.1 Strategies and activities to achieve the objectives

Objectives need to have strategies and activities. Tables 5 and 6 present strategies and activities under each objective.

6.1.1 Protected Area Management

Table 5: Protected Area Management Plan of operation

No.	Objectives: 1. To reduce illegal activities in MMPAC										
	Activity	Indicators	Target	Resources	Timeframe (Yr)					Budget (MK) '000	Possible Source of funds
					1	2	3	4	5		
1.1	Intensify patrols	No. of patrols conducted.	240							36,000	GEF/DNPW/DoF
1.2	Raise awareness for DNPW and DoF staff, Judiciary and Police and Communities on the new legislation	No. of sensitization meetings conducted	10	Funds						18,000.00	GEF/DNPW/DoF
1.3	Develop law enforcement performance appraisal system	Performance appraisal systems in place	1	Funds, personnel,						600	DNPW
1.4	Implement law enforcement performance appraisal system	No of staff appraised	50	Funds, personnel,						300	GEF/DNPW
1.5	Introduce use of modern technologies	SMART technology introduced.	1							2,000.00	GEF
		Drone technology introduced	1							8,000.00	DNPW

		GIS/RS technology introduced	1							6,000.00	DNPW
1.6	Develop an informant system	Informant system developed	1							6,000.00	DNPW/DoF
1.7	Implement an informant system	No. of informants in place	20	Funds, personnel, Mobile phones						1,000.00	GEF/DNPW/DoF
	Objective: 2. Strengthen law enforcement capacity to combat illegal activities in Protected Areas										
2.1	Train law enforcement staff in the use of new technologies	No. of staff trained	50	Training manual, Personnel, Funds						40,000.00	GEF
2.2	Conduct law enforcement refresher courses e.g. BAP	No. of refresher courses conducted	5	Training manual, Personnel, Funds						30,000.00	GEF
2.3	Devise and implement a code of conduct for MMPAC law enforcement officers in line with government guidelines	Code of conduct developed and implemented	1	Personnel, Funds						2,000.00	DNPW/DoF
2.4	Recruitment of additional law enforcement staff	No. of staff recruited	50	Funds						100,000.00	DNPW/DoF

	Objective 3: To improve Protected Area management and ecotourism infrastructure facilities and equipment										
3.1	Zone the MMPAC	Zonation map developed	1	Personnel, funds						2,500.00	DNWP/DoF
3.2	Construct and maintain infrastructure for protected area management	No. of ranger camps	9	Funds						30,000.00	GEF/DNPW
		No. of houses	27							783,000.00	GEF/DNWP
		Length of road network (km)	195							147,175.00	GEF/DNPW
		No. of Water boreholes	12							120,000.00	GEF/DNWP
		No. of entrance Gates	5							2,500.00	DNWP
3.3	Construct and improve ecotourism facilities and equipment	No. of Picnic sites	4	Funds						1,200.00	DNPW
		No. of lodges	2							500,000.00	GEF/DNPW
		No. of sign posts	40							400	DNPW/DoF
		length (km) of trails and tracks	60							3,000.00	DNPW/DoF
		No. of camp sites	4							5,000.00	DNPW/DoF
		No. of viewpoints/ hides	10							6,000.00	DNPW
4.0 To adequately monitor biodiversity for efficient management of the MMPAC											
4.1	Develop long-term ecosystem-wide monitoring systems	Monitoring system developed	1							2,000.00	DNWP/DoF

4.2	Implement long-term ecosystem-wide monitoring systems	Ecosystem based approach monitoring systems implemented	5							60,000.00	DNWP/DoF
4.3	Monitor incidences and levels of illegal harvesting of natural resources (MOMS, SMART, METT scores, Aerial Surveys)	No. of incidences of illegal activities monitored	20	Funds						20,000.00	DNWP/DoF
4.4	Develop fire management plan for MMPAC	Fire management plan in place	1	Funds						6,000.00	DNPW/DoF
4.5	Implement fire management plan for MMPAC	Percentage of illegal fires controlled	95%	Funds						45,000.00	GEF/DNWP/DoF
4.6	Study the status of alien and invasive species in the MMPAC	No of studies conducted and reported	3	Funds						25,000.00	DNWP/DoF
4.7	Develop monitoring mechanisms for key flora and fauna species in the MMPAC.	Monitoring mechanism developed	1	Funds						5,000.00	DNWP/DoF
4.8	Implement biodiversity monitoring mechanisms for key flora and fauna species in the MMPAC	No. of biodiversity surveys conducted	7	Funds						25,000.00	DNWP/DoF
	Objective 5: To develop sustainable finance mechanism for efficient management of the MMPAC										
5.1	Develop MMPAC Business and Marketing Plans	Business and marketing plans developed	1	Funds						3,000.00	DNWP/DoF

5.2	Develop Promotional materials and merchandise	No. promotional materials developed	2	Funds						5,000.00	DNWP/DoF
		No. categories of merchandise promoted	7	Funds						6,000.00	DNWP/DoF
5.3	Review existing and potential financing mechanisms	No. of Review meetings conducted	3	Funds						12,000.00	DNPW/DoF
5.4	Review Gate Entrance Fees from time to time	No. of review meetings conducted	5	Funds						200	DNPW
5.5	Develop and Introduce tourism concessions to increase visitor income potential	No. of Concession agreements developed and signed	3	Funds						6,000.00	DNPW
5.6	Lobby for Revenue Sharing Scheme that retains 50% of all revenue for MMPAC management	Revenue sharing agreement signed	1	Funds						6,000.00	DNPW/DoF
	Objective 6: To strengthen collaboration and coordination amongst stakeholders on MMPAC management										
6.1	Develop and sign Memorandum of Understanding	No. of Memoranda of Understanding developed	4	Funds						25,000.00	DNPW
6.2	Conduct regular meetings	No. Meetings conducted	20	Funds						60,000.00	DNPW/DoF
6.3	Form MMPAC Stakeholders Forum	No. of Stakeholders forum formed	1	Funds						8,000.00	GEF/DoF

6.4	Establish conflict/grievance redress committees	No. of committees formed	1	Funds						8,500.00	DNPW/DoF
6.5	Develop communication strategy	No. of communication strategies developed	1	Funds						18,000.00	DNPW/DoF
	Objective 7: To Improve habitat management										
7.1	Determine carrying capacity for different wildlife species	No. of species per unit area determined	12	Funds						30,000.00	
7.2	Monitor incidences and levels of illegal harvesting of natural resources	No. of incidences of illegal activities reported	20	Funds						10,500.00	DNPW/DoF
7.3	Conduct enrichment planting of indigenous plants	Area (Ha) Enriched	500							176,000.00	GEF/DoF
	Grand totals										2,412,875.00

6.1.2 Community Involvement

Table 6: Community Involvement Plan of Operation and budget

No	Activity	Indicator	Target	Budget (MK)	Time Frame (Years)					Possible funding source
					1	2	3	4	5	
1	To Improve capacity to manage and regulate community resource use programs									
1.1	Develop and implement resource use guide lines	Number of guidelines developed/implemented	1	5,000,000.00						GEF

1.2	Demarcate agreed resource use zones with the communities	Number of resource use zones demarcated	26	15,000,000.00						GEF/DNPW//DoF
1.3	Conduct Capacity gap & resource needs assessment	Capacity gap and assessment report	1	5,000,000.00						GEF
1.4	Conduct resource inventory	Participatory resource Inventory report	9	20,000,000.00						GEF
1.5	Promote Village Forest Areas in the surrounding areas	Hectares of VFAs promoted	2481	15,000,000.00						GEF/DoF
1.6	Build capacity of existing NRCs/VNRMCs in natural resources management	Number of institutions (NRCs/VNRMCs) trained	61	30,000,000.00						GEF
1.7	Development of resource use agreement	Number of agreements signed	26	20,000,000.00						GEF
1.8	Review/develop management plans for VFAs	Number of management plans developed/reviewed	61	25,000,000.00						GEF/DoF
1.9	Setting of harvesting quotas	Number of management plans with harvesting quotas	26	10,000,000.00						GEF/DNPW/DoF
1.10	Facilitate establishment of communal and individual woodlots (Including Moringa)	Number of communal and individual woodlots established	100	50,000,000.00						GEF/DoF
1.11	Promote natural tree regeneration in protected Areas/VFAs	Hectares under natural regeneration promoted	600	20,000,000.00						GEF/DoF
	Sub-Total			215,000,000.00						
2.0	To build capacity and improve community support and participation in sustainable management of natural resources									

2.1	Awareness and sensitizations meetings	Number of awareness/sensitization meetings conducted	61	10,000,000.00						GEF/DNPW/DoF
2.2	Revamp NRCs/VNRMCS/ANRMCs	Number of institutions revamped	65	20,000,000.00						GEF/DNPW/DoF
2.3	Train/Orient NRC/VNRMCS/ANRMCs on roles and responsibilities, leadership skills	Number of trainings conducted	65	60,000,000.00						GEF/DNPW/DoF
2.4	Conduct environmental outreach education campaign awareness programs in community and schools	Number of schools/NRCs promoted	80	30,000,000.00						GEF/DNPW/DoF
2.5	Carry out firebreak maintenance	Distance in Km maintained	100	20,000,000.00						DNWP/DoF
2.6	Revamping community policing structures	Number of community police institutions revamped	26	15,000,000.00						GEF/DNPW/DoF
2.7	Undertake capacity building for frontline staff	Number of frontline staff trained	60	30,000,000.00						GEF/DNPW/DoF
2.8	Sensitize NRCs/VNRMCS on Covid-19	Number of NRCs/VNRMCS sensitized	65	15,000,000.00						GEF/DNPW/DoF
	Sub-Total			200,000,000.00						
3.0	To improve livelihoods for local communities through provision of sustainable IGAs and conservation-based investments									
3.1	Identify and support possible IGAs	Number IGAs identified and supported	30	80,000,000.00						GEF/DNWP/DoF
3.2	Train IGAs groups	Number of IGAs groups trained	30	40,000,000.00						GEF/DNPW/DoF
3.3	Identify alternative resources of energy for local communities	Number of Alternative sources of energy identified	3	5,000,000.00						DoF

3.4	Conduct training for local communities on alternative Income Generating Activities (IGAs) and Community Based Natural Resources Management (CBNRM)	Number of community's institutions trained	30	50,000,000.00						GEF/DNPW/DoF
3.5	Develop ABS community protocols and linking viable to market	Number of enterprises applying ABS protocol	26	60,000,000.00						GEF/DNPW/DoF
3.6	Promote environmentally friendly energy efficient cooking technologies	Number of efficient energy technologies promoted	26	20,000,000.00						GEF/DNPW/DoF
3.7	Promote community ecotourism	Number of ecotourism promoted	4	500,000,000.00						GEF/DNPW/DoF
3.8	Conduct exchange visits on sustainable natural resources management	Number of exchange visits conducted	20	40,000,000.00						
3.9	Undertake stream bank protection	Hectares under stream bank protection	200	50,000,000.00						GEF/DoF
3.10	Undertake participatory forest monitoring in implementation of signed agreements	Number of participatory monitoring visits conducted	61	75,000,000.00						GEF/DoF
3.11	Promote production of grafted fruit trees	Number of fruit trees planted	15,000	60,000,000.00						GEF/DoF
3.12	Identify and link communities to potential market	Number of potential markets identified	6	5,000,000.00						GEF/DNPW/DoF
3.13	Support Savings and loan groups in the impact area	Number of loans groups supported	61	30,000,000.00						GEF/DNPW/DoF
3.14	Promote Bamboo afforestation	Hectares planted with bamboos	50	60,000,000.00						GEF.DoF
3.15	Develop and implement ESMPs	Number of ESMPs developed and implemented	10	30,000,000.00						GEF/DNWP/DoF
Sub-Total				1,105,000,000.00						

	GRAND TOTAL			1,520,000,000.00						
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7. Environmental and Social Impact Assessment (ESIA)

7.1 What is environmental and social impact assessment?

Environmental and Social impact is defined as the change in condition of the resource or environment/social position due to the proposals in the Mwabvi-Matandwe Integrated Management Plan (MMIMP) (including the non-action alternative, or continuation of existing action). Environmental and Social Impact Assessment (ESIA) examines potential impacts of proposed actions in order to propose measures that would ensure that environmental and social quality is maintained, restored, and enhanced. EIA/ESIA is a planning process by which impacts of a proposed activity/project are taken into consideration before major decisions of a project are taken and before commencement of project.

It is a statutory requirement. Environment Management Act (EMA), 2017 provides legal basis for EIA in Malawi and section 24 of EMA prescribes activities that require ESIA before implementation. Non-compliance with ESIA requirement is an offence. It stems from the 1992 Rio Declaration on Environment and Development. Figure 17 below shows EIA/ESIA process;

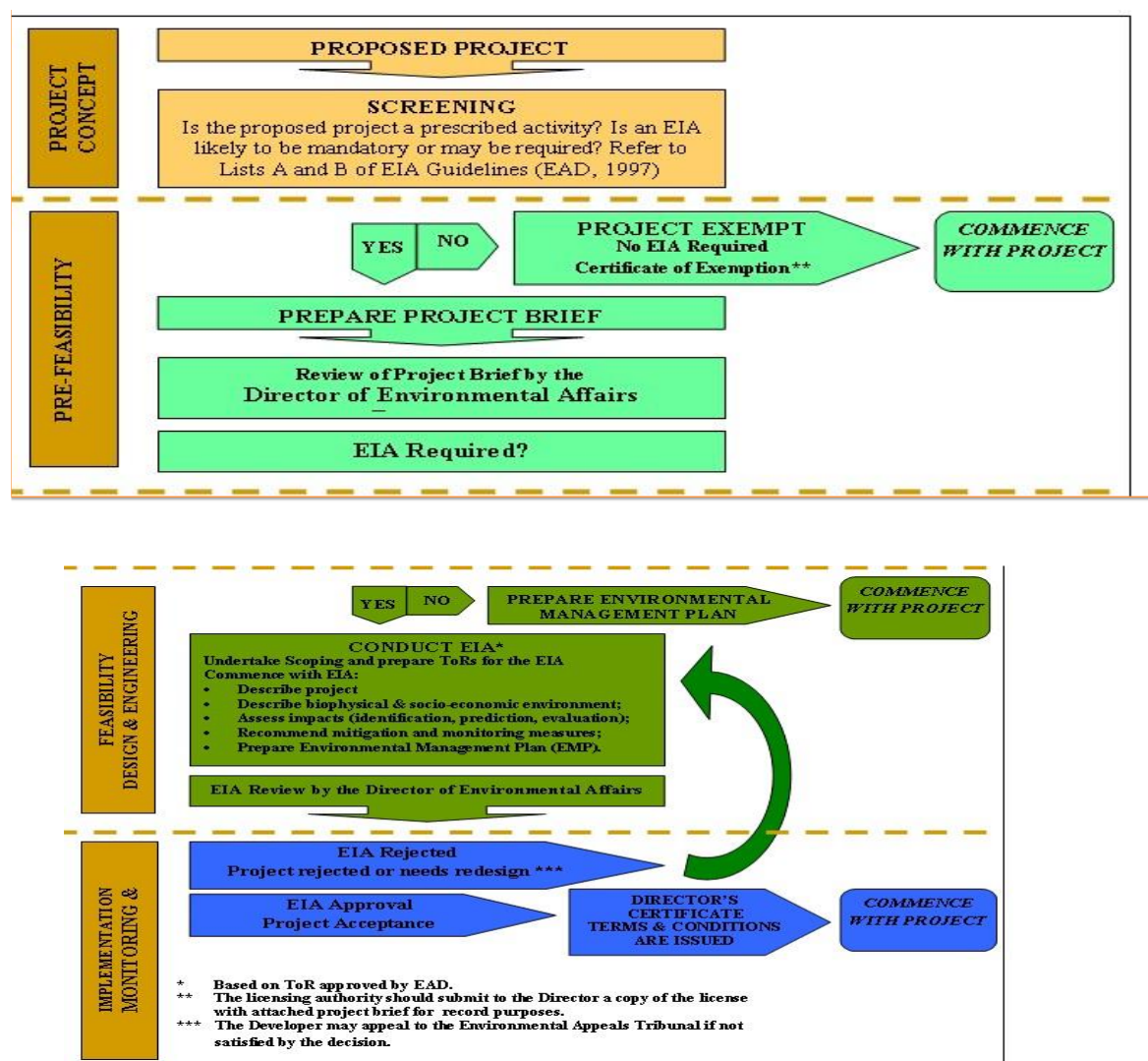


Figure 17: ESIA process

7.2 Importance of EIA/ESIA

The main focus of ESIA is to prevent further environmental degradation and social impacts by minimizing the negative impacts and enhancing positive impacts. An ESIA helps the planning teams achieve the following:

- Recommend actions with positive environmental effects and, where there were negative effects, the least possible negative impacts were considered;
- Recommend actions to resolve existing problem by not creating a series of other problems;
- Identify mitigation actions to reduce, eliminate or offset adverse effects and incorporate these actions directly into the IMP process; and
- Make informed decisions with full understanding of the potential consequences.
- Identify and assess potential risks and benefits based on proposed activities, relevant site features, consideration of natural/human environment, social & trans boundary issues
- Propose monitoring indicators to implement mitigation measures
- Describes institutional framework for environmental management and propose relevant capacity building needs

7.3 Management actions for environmental and social assessment

It was not possible for the planning teams to examine the effects of all the IMP proposals on the MMPAC environments. Thus, the planning teams selected the following nine major proposals for the assessment:

- Adoption of 10% of gross concession proposal;
- Introduction of additional visitor activities;
- Revenue sharing concept between DNPW and DOF;
- Erection of electric fence around the entire Mwabvi game reserve
- Development and implementation of proposed road network;
- Establishment of new camp sites and lodges in the MMPAC;
- Develop Firebreaks throughout the Boundary Zone of MMPAC
- Translocate animals to Mwabvi Wildlife Reserve;
- Establishment of water reservoir for animals

7.4 Environmental topics for environmental assessment

The planning teams defined the environment to mean Physical, biological, cultural, socio-economic aspects and their interrelationships. Based on this definition the planning teams identified the following important environments for environmental assessment:

- Revenue;
- Local communities;
- Biodiversity conservation;
- Ecosystem maintenance and ecological integrity; and
- Staff morale, workloads and performance.
- Genetic resources sustainability
- Cultural heritage conservation

- Mining

7.5 Environmental and social statements

Implementation of this Integrated Management Plan would require heavy initial financial investments. This would have short-term adverse effects on financial resources and the budgets of the MMPAC. However, in the long-term, the MMPAC would benefit financially from increased income resulting from diversified visitor uses such as game viewing and other self-financing strategies that are proposed in the IMP. It is anticipated that in the short-term, establishment of campsites, improvements of old roads and development of new road network would affect the biophysical resources since there would be loss of trees and vegetation during upgrading of the roads. Furthermore, risk of injuries, increased risk of theft at camp site and transmission of sexually transmitted diseases would be increased among the contactors' workers and surrounding communities. Hence the IMP proposes Environmental and Social screening for all new physical developments in the MMPAC and come up with a simple Environmental and Social Management Plan (ESMP) that would address minor issues that have arisen from Environmental and social screening.

Revenue sharing arrangement between DNPW and DoF will have some costs to the MMPAC. Mwabvi PAC would have to share the meagre financial resources with the Matandwe FR. In the short-term, this arrangement would create financial constraints to the Mwabvi PAC. However, in a long-term, both MGR and MFR should benefit from diversified visitor opportunities and increased revenue from the increase of visitor attractions resulting from co-management of these areas. Also managing the entire ecosystem as one unit should reduce the overall operational costs resulting from economies of scale. In the short-term, creation of new roads, especially in the MFR, would increase the running costs of the MGR. However, in the long run, the MMPAC should benefit from improved road conditions and network. These mitigation measures will be instituted through the proposed Environmental and social screening exercises prior to any physical developments. On the other hand, adverse impacts from diversified visitor opportunities on the ecosystem have been mitigated through setting Limits of Acceptable Use (LAU) for the Visitor Development Zone (VDZ) and other zones.

The following are the most beneficial proposals of the IMP, in a priority list:

- Introduction of 10% of gross income agreement with Concessionaires;
- Erection of electric fence on the entire MWR;
- Diversification of appropriate visitor activities;
- Development of firebreaks along the Boundary Use Zone;
- Construction of new camp sites for rangers and tourists;

Also, the following environments would benefit significantly from the implementation of the IMP:

- Staff morale, efficiency and effectiveness;
- Visitor enjoyment and experience;
- Local community;

- Ecosystem integrity.
- Livelihood enhancement

7.6 Detailed description of environmental and social assessment

7.6.1 Impacts on revenue

<i>Description</i>	One of the strategic objectives of the MMPAC is to ensure that revenue operational and development costs are met through self-financing. This could be achieved through rationalizing operational costs and increasing income through a variety of means. At the moment MMPAC operates below the break-even point.
<i>Plan elements affecting topic</i>	Enhanced visitor experience and enjoyment, improving road conditions and network, promoting MMPAC locally and internationally, establishment of new visitor facilities, and protecting the MMPAC environment.
<i>Impacts if plan is implemented</i>	Diversifying visitor opportunities, improving visitor facilities and infrastructure, protecting all attractions of the MMPAC and marketing the MMPAC will increase the number of visitors, thus boost the revenue. Increased expenditures on operations will ensure efficiency and effectiveness.
<i>Impacts if plan not implemented</i>	MMPAC will continue to operate at below break-even point, thus continue to drain financial resources from tax payers that could be available for alternative development projects elsewhere in the country. MMPAC would fail to undertake its operations thus fail to protect outstanding resource values of the complex
<i>Comments</i>	Marketing efforts intensified and access to the park eased. Running costs rationalized. Self-financing proposed mechanisms implemented

7.6.2 Local communities

<i>Description</i>	This plan seeks to ensure good working relationship between MMPAC and all relevant stakeholders, reduce illegal activities and increase support from the neighbouring human communities.
<i>Plan elements affecting topic</i>	Community conservation promoted, human-wildlife conflicts minimised, human density effects reduced and sustainable land uses adjacent to the MMPAC promoted.
<i>Impacts if plan is implemented</i>	Local people's knowledge and attitude enhanced. Local economies stimulated by increased visitors' numbers in the MMPAC. MMPAC/Stakeholder relations improved. Support to the MMPAC from stakeholders will be increased and effects of high human density on MMPAC reduced.
<i>Impacts if plan not implemented</i>	Ignorance on conservation issues and poverty will increase resentment of local people and encroachment into MMPAC. Support from local people will be difficult.

<i>Comments</i>	Providing support to community-initiated projects, developing stakeholder forum and enhance extension services will reduce the dependence of neighbouring human communities on MMPAC resources and reduce the conflicts of use
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7.6.3 Biodiversity conservation

Visitors might come to Mwabvi and see several biodiversity aspects including mammals such as buffalos and impala. Black Rhinoceros will be introduced and visitors might see this animal as well. Relating to vegetation, visitors might come to see unique mopane wood land and Mwabvi Tree. For MFR, they will see the famous Colombo plant (*Jateorhiza palmata*), and Teak wood (*Tectona grandis*). Furthermore, flora species that are so unique to MMPAC would be restocked to attract tourists and these include *Khaya anyasca*, *Adzelia quanzensis*, *syzygium cordatum*, *Albizia lebbbeck*, *Pterocarpus angolensis* and *Ficus natalensis*.

Described below is additional biodiversity information for the two protected areas.

<i>Description</i>	MMPAC is one of the sites in Malawi with high biodiversity values.
<i>Plan elements affecting topic</i>	Increased number of Ranger Posts and Ranger Force, erecting the fence around the Rhino sanctuary, research and monitoring, reduce human-wildlife conflicts.
<i>Impacts if plan is implemented</i>	Joint patrols, increased number of Range Posts, completion of the fence around MMPAC and improvement in the relationship between the MMPAC and surrounding human communities will increase protection of Biodiversity. Research and monitoring will provide adequate management information for biodiversity. Carrying out EIA of any introduction will help secure biodiversity value of MMPAC.
<i>Impacts if plan not implemented</i>	Loss of indigenous species and loss of wilderness character. Tourism will deteriorate and revenue will be adversely affected.
<i>Comments</i>	Ensure that the management zone scheme is implemented

7.6.4 Ecosystem maintenance and ecological integrity

<i>Description</i>	Maintenance of ecological integrity is key in minimizing chances of extinction of the species of the MMPAC
<i>Plan elements affecting topic</i>	Joint development and implementation of the IMP, increased number of Ranger Posts and support for development and implementation of land use plan in areas surrounding MMPAC
<i>Impacts if plan is implemented</i>	Free movement of genetic materials, possibilities of introducing wildlife species that used to exist in the MMPAC
<i>Impacts if plan not implemented</i>	Increased poaching and subsequent extinction of certain species
<i>Comments</i>	Ensure that the IMP is implemented

7.6.5 Staff morale, workloads and performance

<i>Description</i>	Improved staff morale is key in achieving the purposes of MMPAC. Equitable staff workloads and incentives are important ingredients of improved staff morale for effective and efficient MMPAC conservation
<i>Plan elements affecting topic</i>	Infrastructure, facility and equipment improvements, improvement of social services and provision of training.
<i>Impacts if plan is implemented</i>	High staff morale, efficiency and effectiveness, increased level of protection of MMPAC resource values
<i>Impacts if plan not implemented</i>	Low staff morale, inefficiency and ineffectiveness, declining natural conditions in the MMPAC due to increased poaching
<i>Comments</i>	Ensure implementation of the IMP

7.6.6 Site and action specific EIA/ESIA required

MMPAC	Private Sector
All Public Camp sites	Development of additional visitor accommodation
Relocating the MMPAC HQs	Introduction of any visitor activity outside the Visitor Development Zone
Construction of tracks and roads	
Introduction of any visitor activity	
Construction of Ranger Posts that are inside the MMPAC	
Re-introduction of extinct species such as Black Rhino	

Table 7: Environmental Assessment Matrix

Environmental Assessment Topics Major Proposals of the IMP	MMPAC Revenue	Local Community	Biodiversity Conservation	Visitor Experience	Ecosystem Maintenance	Staff Morale, Performance and	Total	
Adoption of 10% of gross income of Concessionaires	+2	+1	+2	0	+2	+2	9	
Diversification of visitor opportunities in MMPAC such as presence of unique plants, animals and areas of special interest (e.g. <i>Mwala wa nkhunda</i>).	+2	+1	-1	+2	-2	+2	4	

Revenue sharing arrangement between DNPW and DOF	-2	0	+1	0	+2	+2	3	
Erection of electric fence on the rhino sanctuary	-2	+2	+1	+1	+2	+1	5	
Development of new road network	-2	0	-1	+2	-2	+2	-1	
Construction of 4 new camps	+2	+1	-1	+2	-1	+1	4	
Development of Firebreaks along the Boundary Use Zone	-2	+2	-1	+1	+2	+2	4	
Translocate animals to Mwabvi W/R	+2	0	+1	+2	+1	+1	7	
Removal of Rhino Fence	-1	0	+2	+2	+2	-2	3	
Total	-1	8	4	12	6	11		

Key to levels of significance

- +2 Significantly Positive Impacts
- +1 Positive Impact
- 0 Neutral Impact
- 1 Negative Impacts
- 2 Significantly Negative Impacts

8. Implementation strategy and process

Implementation is the most important stage of an IMP. Clear strategies and defined processes are key in ensuring effective and efficient implementation of the IMP. This chapter describes the strategy and process for implementing Mwabvi-Matandwe General Management Plan.

At the implementation stage, the management zone scheme and plan of actions are put into practice through the allocation and disbursement of funds. A major priority during this stage is to ensure that planned activities are carried out in the way and within the period that was planned. To ensure that the IMP is effectively and efficiently implemented, the formation of an IMP Implementation Team (IMPIT) and preparation of Annual Operation Plan and Budget (AOPB) are necessary. Other essentials to effectively and efficiently implement the IMP are:

- Development and implementation of a monitoring plan, with objectively verifiable performance indicators;
- Purchase of essential movable and fixed assets; and
- Filling the staff workload gaps.

8.1 Annual operation plan and budget

Annual Operation Plan and Budget (AOPB) is a yearly administrative plan prepared by the IMP implementation team detailing specific activities that will be undertaken during the fiscal year. Information for the AOPB shall be taken directly from the IMP. The AOPB should delineate the specific activities, associated resources and amount of money that needs to be disbursed each year to implement the IMP.

The AOPB is detailed and attached as an appendix. Each year, the IMP Implementation Team shall identify annual activities, based on the Plan of Action Framework, and prepare an annual budget.

8.2 Formation of the IMP implementation team

This team shall comprise of the following proposed staff and stakeholders:

- 1 representative from DNPW Headquarters;
- 1 representative from DOF Headquarters;
- 1 representative from MMPAC Concessionaires;
- 1 representative from MMPAC donor community;
- Reserve Manager, MWR;
- Officer in Charge, MFR;
- Head of Law Enforcement, MWR/MFR; Officer in Charge of Tourism, MWR/MFR;
- A Representatives from Nsanje District Council;
- In Charge of Works, MWR/MFR;
- Researchers that are working in the MMPAC; and
- Any other, as determined by the IMPIT.

Table 8 below summarizes Terms of Reference for the IMPIT and outline timing and mode of operation of the team.

Table 8. Terms of Reference of IMPIT

<i>Terms of Reference</i>	<i>Timing</i>	<i>Mode of Operation</i>
1. Develop the desired indicators of resource and social conditions (MMPACC members)	2 days, once a year	Workshop
2. Inventory of baseline resource and social conditions (MMPAC members)	1 month, once	Field survey, office searches
3. Specify standards for desired resource and social conditions (MMPAC members)	2 days, once	Workshop
4. Review a monitoring plan, based on baseline resource and social conditions	3 days, once	Workshop
5. Monitor resource and social conditions (MMPAC members)	Continuous, meet twice a year	Meeting
6. Review the Annual Operation Plan and Budget	3 days, once a year	Workshop
7. Monitor annual activities, and review those activities as it deems necessary	Continuous, meet twice a year	Meeting

8. Review the IMP as circumstances change or as information becomes available	Meet once after 2 years	Meeting
9. Any other as agreed by the IMPIT		

The Warden In-Charge of MWR or MFR shall be the Secretary of IMPIT, on alternate basis. The GIT will elect a Chair once, every year, after two years. Membership of the IMPIT ceases when a member fails to attend three consecutive meetings or workshops.

8.3 Monitoring and evaluation framework

Monitoring and evaluation are essential management functions that are interactive and mutually supportive. Monitoring is a continuous activity of assessing the progress in the implementation of the IMP. It involves collection, storage and analysis of data for improved implementation. The following are objectives of monitoring the IMP:

- Compliance with DNPW and DOF policies, procedures and legislation;
- Provide early indicators of progress, or lack thereof, in the implementation of IMP;
- Identify risks and adverse environmental impacts of implementing the IMP;
- Control and improve the IMP on the basis of practical information; and
- Assess whether or not the IMP continues to be relevant as implementation unfolds.

Monitoring Plan Framework shall be completed and coordinated by the GIT. The plan contains the following information:

- Strategic objectives, as envisaged by the Corporate Plan;
- Targets;
- Verifiable indicators;
- Monitoring frequency
- Means and sources of verification; and
- Roles and responsibilities for collection and management of collected data.

On the other hand, evaluation is a time-bound exercise that attempts to assess, systematically and objectively, the impacts, effectiveness, efficiency and relevance of an ongoing or completed IMP. Evaluation can take place:

- Before implementation of the IMP (baseline evaluation);
- When the IMP is still underway (mid-term);
- On completion of the IMP (end-of-the plan); and
- A number of years after completion of the IMP (ex-post evaluation).

The baseline evaluation has to be conducted during the formulation and design of the IMP to make final decisions on alternatives to be implemented and make decisions on how it will be implemented. Once the IMP is partially or completely implemented, it would be useful to look back over what took place, to compare actual progress with the plans, and judge whether the decisions and actions taken were reasonable and useful. This kind of analysis would help not

only in the management of the IMP during and after the initial implementation phase, but would also help in preparation of future IMPs and in the review of current conservation planning and management policies, practices and legislation in Malawi.

Therefore, it would be important for the GIT to draw TOR and contract an independent Consultant to carry out baseline, mid-term, end-of-the plan and ex-post evaluation exercises. Evaluation Plan Framework would help the Consultant in the assessment of impacts, relevance, efficiency and effectiveness of the IMP.

8.4 Staff Requirements

Tables 9, and 10 below summarize types and number of existing staff and type and number of required staff members for effective and efficient implementation of the IMP.

Table 9: Existing and required staff (MWR)

Section	Position	Existing	Estimated Requirements	Need
Administration	Park Warden I/C (Reserve Manager)	1	1	0
	Accountant	0	1	1
	Assistant Accountant	0	1	1
	Office Attendant	0	1	1
	Drivers (Boat)	1	0	0
	Store Clerk	0	1	1
	Drivers	1	2	1
Anti-Poaching/Law enforcement	Warden (Anti-Poaching)/Head of law enforcement	1	1	0
	Zonal Warden	2	2	0
	Rangers	12	24	12
	Tourism Officer	0	1	1
Works	I/C Works	0	1	1
	Garage Mechanics	0	1	1
	Roads	0	2	2
	Lorry/Tractor Drivers	0	1	1
Buildings	Mason	0	1	1
	Carpenter	0	1	1
Ecology	Ecologist	0	1	1
	Drivers	1	2	1
Total		19	45	27

<i>Section</i>	<i>Position</i>	<i>Existing</i>	<i>Estimated Requirements</i>	<i>Need</i>

Administrati on	Park Warden I/C	0	1	1
	Accountant	0	1	1
	Assistant Accountant	0	1	1
	Accounting Clerk	0	1	1
	Secretary	0	1	1
	Typist	0	1	1
	Office Attendant	0	1	1
	Store Clerk	0	1	1
	Drivers	1	2	1
Anti- Poaching	Warden (Anti-Poaching)	0	1	1
	Rangers/ Forest guards	2	30	28
Tourism	Warden Tourism	0	1	1
	Tourism Officer	0	1	1
	Rest House Attendant	0	2	2
	Caretaker-Rest/Camp	0	4	4
Works	I/C Works	0	1	1
	Garage Mechanics	0	2	2
	Electrician	0	1	1
	Auto Electrician	0	1	1
	Roads	0	4	4
	Foreman	0	1	1
	Lorry/Tractor Drivers	0	1	1
	Assistant Drivers	0	2	2
	Heavy Plant Assistants	0	1	1
Buildings	Carpenter	0	1	1
Ecology	Ecologist	0	1	1
	Field Assistant	2	4	2
	Computer Technician	0	1	1
	Drivers	1	2	1
Total		6	72	66

8.5 Fixed capital requirements

Tables 10 and 11 below summarize types and amount of fixed capital developments required to effectively and efficiently implementing this IMP. Fixed capital requirements are buildings and roads.

Table 10: Types and Amount of Fixed Capital Developments Required (MWR)

<i>Type of development</i>	<i>Amount (number or/and size)</i>
Ranger Camps	4 With six Scouts at each
Roads	78.8 Km
Tracks	2
Public Camp Site	1
Tourist Bandas	1 Lodge
Picnic Sites	3
Staff Houses, Park/Reserve Headquarters	16

Table 11:Types and Amount of Fixed Capital Developments Required (MFR)

<i>Type of development</i>	<i>Amount (number or/and size)</i>
Ranger Camps	6
Roads	280Km
Tracks	105Km
Public Camp Site	4
Tourist Bandas	6
Picnic Sites	6
Staff Houses, Park/Reserve Headquarters	30

8.6 Movable capital requirements

Tables 12 and 13 below summarize types and amount of existing and required movable capital required to effectively and efficiently implementing this IMP. Movable capital requirements include vehicles, road maintenance equipment, radios, and office equipment and field equipment.

Table 12. Types and Amount of Existing and Required Movable Capital

Section	Item	Existing	Required	Needs
Office	Computers	1	3	2
	Printers	0	3	3
	Photocopier	0	1	1
	Laptop	2	4	2
	Scanner	0	1	1
Communication	Server	0	1	1
	Network facilities	0	1	1
	H.F. System	1	6	5
	VHF System	3	8	5
	Inter/Intranet facilities	0	1	1
Vehicles	Administration	0	1	1

	Anti-poaching	1	1	0
	Ecology/Extension	0	1	1
Road maintenance	Grader	0	1	1
	Water Bowser	0	1	1
	Tractors	0	1	1
Field Equipment	Tents	17	24	7
	GPS	6	6	0
	Binoculars	0	8	8
	Cyber tracking device	2	4	2
	Digital Camera	0	4	4
	Stretchers	0	4	4
	Rain gauges	0	1	1
	Thermometers	1	1	1
	Barometer	0	1	1
	Boots	19	48	29
	Rucksacks	8	24	16
	Stockings	19	48	29
	Standard uniform	19	48	29
	Belts	19	48	29
	Shoulder flashes	19	48	29
	Water bottles	0	24	24
	Berets	19	48	29
	Jungle hat	19	48	29
	Lanyard	19	48	29
	Sleeping bag	0	24	24
	Sleeping mat	0	24	24
	Bevy	0	24	24
	Rain suit	0	24	24
	Harlequins	19	48	29

Table 13: Types and Amount of Existing and Required Movable Capital (MFR)

Section	Item	Existing	Required	Needs
Office	Computers	2	5	3
	Printers	2	2	0
	Photocopier	2	3	1
	Laptop	1	3	2
	Digitizer	0	2	2
	Plotter	0	1	1
	Scanner	0	1	1
Communication	Saver	0	1	1
	Network facilities	0	8	8
	H.F. System	0	13	13
	VHF System	0	13	13

	Inter/Intranet facilities	0	1	1
	Satellite Telephone	0	2	2
Vehicles	General	1	2	1
	Administration	0	1	1
	Anti-poaching	0	1	1
	Ecology	0	1	1
	Tourism	0	1	1
	Water Bowser	0	3	3
	Tractors	0	3	3
	Tippers	0	1	1
Field Equipment	Tents	0	30	30
	GPS	4	7	3
	Binoculars	0	8	8
	Digital Camera	0	5	5
	Stretchers	0	6	6
	Rain gauges	0	5	5
	Thermometers	0	7	7
	Barometer	0	7	7
	Boots	0	72	72
	Rucksacks	0	36	36
	Stockings	0	72	72
	Standard uniform	2	36	34
	Belts	2	72	70
	Shoulder flashes	0	72	72
	Water bottle	0	36	36
	Berets	2	72	70
	Jungle hat	2	72	70
	Lanyard	0	72	72
	Sleeping bag	0	36	36
	Sleeping mat	0	36	36
	Bevy	0	36	36
	Rain suit	0	36	36
	Harlequins	0	72	72

8.7 Memorandum of Understanding and an agreement

In order to begin the implementation of the joint IMP, the relevant implementation departments (DNPW and DOF) must develop and sign a Memorandum of Understanding and an Agreement on the implementation of the IMP. Details on what to include in the MoU and an Agreement and how to develop and sign the documents are contained on the Plan of Action chapter.

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