Greater Maasai Mara Ecosystem Management Plan, 2023-32

February 2023

Acknowledgements

	The GMME plan was developed in a participatory planning process spearheaded by a Core Planning Team (CPT) comprising of representatives from: County Government of Narok, Maasai Mara Wildlife Conservancies Association, Kenya Wildlife Service, Wildlife Research and Training Institute, Kenya Wildlife Conservancies Association, and Kenya Wildlife Trust. The MMWCA coordinated plan development ensuring that planning activities were implemented as scheduled, while CPT members provided essential planning information and participated in all planning activities.
	The Ministry of Tourism and Wildlife funded the plan drafting meetings through the GEF-funded and UNDP-implemented project titled "*Combating Poaching and Illegal Wildlife Trafficking in Kenya through an Integrated Approach*"**.**
	The GEF-funded and UNDP-implemented project titled "*Combating Poaching and Illegal Wildlife Trafficking in Kenya through an Integrated Approach*" co-funded the planning process by supporting stakeholder plan drafting workshops.
	Researchers from the Kenya Wildlife Trust and One Mara Research Hub, funded by Basecamp Explorer Foundation (Norway) with a grant from NORAD, prepared and availed a plan foundation paper that provided the rationale for key management decisions contained in this plan.
	GIZ funded the Planning Consultant who provided technical assistance and facilitated the planning process.

USAID FROM THE AMERICAN PEOPLE	USAID co-funded the planning process. It supported the Plan Scoping Workshop; Planning Process Launch Meeting; Core Planning Team Meeting; Field Reconnaissance; and Plan drafting.
The Nature Conservancy	The Nature Conservancy Co-funded the planning process. Specifically, it funded the Plan Scoping Workshop
SNV Netherland Development Organization	SNV provided information relevant to planning and participated in the planning meetings.
MARA ELEPHANT PROJECT	The Mara Elephant Project provided information relevant to planning and participated in the planning meetings and events.
Neil Anthony	Mr. Neil Anthony co-funded the planning process by supporting plan drafting meetings.
Apollo Kariuki	Mr. Apollo Kariuki, Conservation Planning Consultant, facilitated the planning meetings and compilation of the GMME Management Plan.

The Core Planning Team Members that oversaw plan development were:

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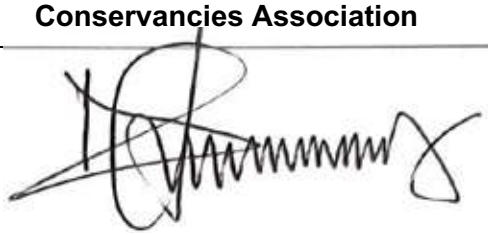
10. Dr. Irene Amoke	Kenya Wildlife Trust
11. Jully Senteu	Kenya Wildlife Trust
12. Wilson Sairowua	Mara Elephant Project

Approval Page

The County Government of Narok, Maasai Mara Wildlife Conservancies Association, Kenya Wildlife Service, and the Wildlife Research and Training Institute have approved the implementation of this management plan for the Greater Maasai Mara Ecosystem, 2023 – 2032.

On behalf of **County Government of Narok**	*On behalf of* **Maasai Mara Wildlife Conservancies Association**
	
H.E Patrick K. Ole Ntutu	Daniel Ole Sopia
Governor	Chief Executive Officer
Date: 28.02.2023	Date: 28.02.2023
On behalf of **Kenya Wildlife Service**	*On behalf of* **Wildlife Research and Training Institute**
	
Dr. Erustus Kanga	Dr. Patrick Omondi
Director General	Director
Date: 28.02.2023	Date: 28.02.2023

Executive Summary

The GMME management plan (2023-2032) has been developed in accordance with the Convention on Biological Diversity (CBD) guidelines for the implementation of the ecosystem approach and the Protected Areas Planning Framework (PAPF), the conservation planning standard for protected area and ecosystem plans in Kenya. In line with the CBD guidelines and the PAPF, the key features of the plan are participatory planning, evidence-based decisions, integrated land use management, community benefits from ecosystem services, and adaptive management. Its aim is to ensure coordination and integrated management of the three major components that constitute the ecosystem the Maasai Mara National Reserve (MMNR), the semi-protected area (Conservancies) and the nonprotected area. To achieve this, the plan sets out 10-year stakeholder-agreed vision and goals that will be pursued for the entire GMME, and management objective and actions that will be implemented to achieve these goals.

The GMME planning process involved a wide range of GMME stakeholders including, representatives of the local community, National and County Government agencies, Non-Governmental Organizations, Mara Tourism Partners and development partners (Annex 2). These stakeholders participated in the planning process through the following mechanisms: Core Planning Team meetings; Planning Process Launch Meeting; Stakeholder Planning Workshops; information gathering; plan drafting workshops; public participation meetings; plan approval meetings; and plan launch meeting.

GMME Vision Statement

The GMME's vision is:

"A healthy and sustainable ecosystem for improved human well-being"

Exceptional Resource Values

The Exceptional Resource Values (ERVs) at the GMME that stakeholders will aim to maintain or improve are grouped into four categories: Biodiversity, Scenic, Sociocultural and Economic (see table below).

GMME's Exceptional Resource Values

Category	Exceptional Resource Value
Biodiversity	World-famous Wildebeest Migration
	Highest wildlife density in Kenya
	Threatened species
	Rhino conservation
	Lion conservation
	Important Bird & Biodiversity Area (IBA) listing
	World Heritage Tentative listing
	Recognition as one of the "Seven Natural Wonders of Africa" and "ten Wonders of the World"

Category	Exceptional Resource Value
Scenic	Scenic features (Mara, Talek and Sand Rivers hills and escarpments, grassland plains Loita and Nyekweri Forests)
Socio-cultural	The Mara Conservancy Model
	Maasai Culture
	Loita Forest traditional community-based forest governance system
	Archaeological sites
	Wildlife research
	Education
Economic	National Economic benefits
	Local economic benefits of wildlife based eco-tourism

Threats to ecosystem values

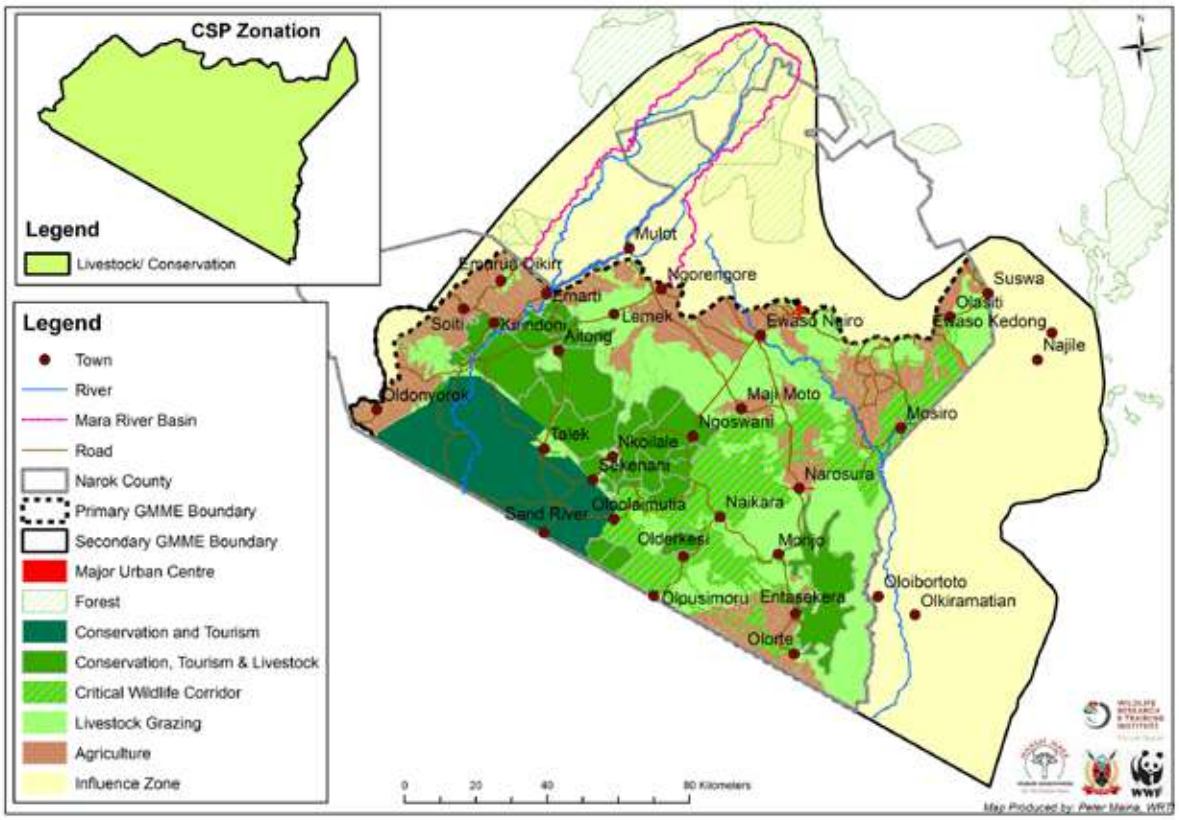
The key direct threats to GMME's values are: fencing, deforestation, declining Mara River flow, charcoal burning, human-wildlife conflict, agriculture land use, poaching, unplanned settlements and urbanization, unsustainable livestock grazing, infrastructural developments, invasive species and climate change effects. This plan addresses these threats among others, through the plan's land use zoning and its five management programmes.

Ecosystem Zoning

To achieve the GMME's conservation, tourism, and community livelihoods management objectives, a land use zoning plan consisting of six (6) zones has been developed (see Figure below). The land use zones are:

- **Conservation and Tourism Zone**
- **Conservation, Tourism and livestock Zone**
- **Livestock Grazing Zone**
- **Agricultural Zone**
- **Urban Centres**
- **Influence Zone**

Where multiple functions are listed per zone, these functions will be managed to coexist with each other.



The GMME Land Use Zoning

Management Programmes

The plan has five management programmes which are briefly discussed below:

Natural Resource Conservation and Management Programme

The Natural Resource Conservation and Management Programme's overall goal is *to sustainably manage the GMME's natural resources for provision of ecosystem services and other benefits of nature to the local community, the country, and the world in general.* To achieve this goal, the programme addresses issues related to habitat loss and degradation, and wildlife population decline through sustainably managing rangeland, forest, water and wildlife resources. The priority actions under this programme focus on: identifying, mapping and securing critical wildlife corridors and dispersal areas; surveying and marking forest boundaries; working with Water Resource Users Associations (WRUAs) in protecting and rehabilitating riparian areas; promoting rainwater harvesting for domestic use, livestock and irrigation; controlling wildlife poaching and Human-wildlife Conflict related wildlife killing; controlling and managing wildlife diseases; and developing, implementing and revising management and recovery plans for declining wildlife species, including the restoration of recently lost migration corridors.

Tourism Development and Management Programme

The Tourism Development and Management Programme aims *to reaffirm and consolidate Mara as Kenya's flagship destination by upgrading services and standards to ensure tourism continues to be a pillar for biodiversity conservation in the ecosystem.* This will be achieved through implementation of objectives focusing on: diversifying the tourism product and enhancing customer experience; diversifying and improving visitor facilities; developing and maintaining infrastructure network; and modernizing marketing strategies and improving image. The priority actions under this programme aim to: develop minimum tourism standards; enhance and identify new and unique niche tourism products for tourist attraction; develop minimum space prescription for tourism investments; mobilize tourism stakeholders to support the land leasing and conservation easements to secure critical dispersal areas that sustain the Mara tourism brand; regulate commercial development through spatial planning compatible to conservation; upgrade existing and increase visitor amenities; and develop a distinct brand image for the Mara destination.

Community Livelihoods Programme

The overall goal of the Community Livelihoods Programme is *to improve community livelihood through enhanced stakeholder participation in sustainable natural resources management*. This will be achieved through enhancing community benefits from conservation; enhancing conservation education and awareness; reducing Human-Wildlife Conflict; promoting holistic livestock and grasslands management; and promoting Climate Smart Agriculture in agropastoralism areas. The priority actions under this progamme include: establishing new conservancies and strengthening existing ones; supporting social development projects; promoting non-tourism based income generating activities; negotiating long-term leases to cushion conservancies from unpredictable downturns in the tourism industry; developing carbon credit projects; promoting creation of wildlife conservation easements; promoting predator proof Bomas; promoting climate resilient livestock feeding strategies; and promoting adoption of improved and adapted livestock breeds

Institutional Collaboration and Governance Programme

The goal of the Institutional Collaboration and Governance Programme is *to strengthen capacity, representativeness and collaboration among locally led institutions to deliver targeted conservation and development actions*. To achieve this goal, stakeholders will aim at strengthening institutional capacity for ecosystem management; and establishing and strengthening sustainable governance arrangements in the GMME's nonprotected areas. The key management actions that will be implemented under this programme focus on: establishing and gazetting a Plan Implementation Committee; establishing a wildlife security coordination hub; establishing a GMME Land Trust as a mechanism to keep land within the community; advocating for national and county government support to wildlife conservancies; and establishing a network of community conserved areas on the Loita-Mosiro Ecoregion.

Research and Knowledge Management Programme

The Research and Knowledge Management Programme's overall goal is *to conduct and coordinate research in the GMME to enable provision of accurate data and information to support decision making*. This will be achieved through: enhancing coordination and compliance with wildlife research protocol; generating scientific data and information to support planning and decision making; enhancing collaborations and partnerships in wildlife research; and strengthening the Maasai Mara Research Station's capacity to conduct and coordinate wildlife research. The priority management actions that will be implemented under

this programme focus on: developing an integrated wildlife data and information system for the GMME; coordinating wildlife research conducted by local and international researchers; organizing annual GMME research conferences; designing and implementing a long-term ecological monitoring programme; working with “One Mara Research Hub” to improve research coordination and information sharing; conducting collaborative cross-border wildlife censuses; and strengthening the MMRS’s human resource and infrastructural capacity.

Plan Implementation, Monitoring and Evaluation

This chapter presents the implementation plan for the GMME management plan. This plan takes the management actions, elaborated in detail under the five management programmes, and prioritizes them by according to those that need to be implemented in the short-term (1-3 years), medium-term (4-6 years) and long-term (7-10 years). The implementation plan also identifies the institutions that will take the lead role in the implementation of individual management actions, the key partners that will be involved, as well as key milestones for each action.

To ensure that plan implementation is well coordinated, a plan implementation structure bringing together all the stakeholders in the ecosystem, is proposed. The roles and responsibilities of critical actors in the implementation of the plan are also provided.

It is essential to undertake monitoring and evaluation in order to measure and assess progress in plan implementation, learn from findings and experiences, and decide on what actions to take to achieve better outcomes. Monitoring and Evaluation (M&E) will be a useful mechanism to assist plan implementers track and determine the progress they are collectively making through their individual efforts, and for the GMME Plan Steering Committee to provide oversight on plan implementation in a structured manner.

The primary responsibility for plan monitoring lies with the implementing organizations, with the Plan Implementation Committee (PIC) coordinating plan monitoring and providing technical oversight to ensure that all implementing agencies have requisite capacity to report on progress in the provided format. The Plan Implementation Coordinator, working under the guidance of the PIC, will be responsible for developing a detailed monitoring plan in collaboration with the implementing agencies.

On the other hand, the primary responsibility for plan evaluation lies with PIC. The PIC will conduct the mid-term evaluation after six years and final evaluation at the end of the 10-year plan duration.

Contents

Figures

Tables

Acronyms

AGM	Annual General Meetings
BBC	British Broadcasting Corporation
BCEFK	Basecamp Explorer Foundation-Kenya
CAP	Conservation Action Planning
CBD	Convention on Biological Diversity
CBPP	Contagious bovine pleuropneumonia
CDF	County Development Fund
CFA	Community Forest Association
CGIAR	Consultative Group for International Agricultural Research
CGN	County Government of Narok
CIH	Climate Information Hub
CNN	Cable News Network
CNR	Cultural & Natural Resource
COK	Constitution of Kenya
COVID-19	Coronavirus Disease
CR	Critically Endangered species
CSP	County Spatial Planning
CWCC	Community Wildlife Conservation Committee
DRSRS	Directorate of Resource Surveys and Remote Sensing
ECF	East Coast Fever
EIA	Environmental Impact Assessment
EMCA	Environmental Management and Co-ordination Act
EN	Endangered species
FMD	Foot-and-mouth Disease
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GMME	Greater Masai Mara Ecosystem
GMR	Guaranteed Minimum Returns
GoK	Government of Kenya
GSME	Great Serengeti- Mara Ecosystem
HWC	Human-Wildlife Conflict
ICPAC	IGAD Climate Prediction and Applications Centre
IGAD	Intergovernmental Authority on Development
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IWF	Illegal Wildlife Trafficking Project
JPIC	Joint Plan Implementation Committee
KEA	Key Ecological Attributes
KFS	Kenya Forestry Service
KIPRA	Kenya Institute for Public Policy Research and Analysis
KMD	Kenya Meteorological Department
KWCA	Kenya Wildlife Conservancies Association
KWS	Kenya Wildlife Service
KWT	Kenya Wildlife Trust
MAB	Man and the Biosphere Programme
MCF	Malignant Catarrh Fever
MEP	Mara Elephant Project

MFC	Mau Forest Complex
MMNR	Masai Mara National Reserve
MMWCA	Mara Wildlife Conservancies Association
MoE	Ministry of Environment
MoU	Memorandum of Understanding
MPCP	Mara Predator Conservation Project
NCNRN	Narok County Natural Resource Network
CGN	County Government of Narok
NEMA	National Environment Management Authority
NGO	Non-Governmental Organisation
NORAD	Norwegian Agency for Development Cooperation
NP	National Park
NR	National Reserve
NRCM	Natural Resources Conservation and Management Programme
NTB	National Tourism Blueprint
NWS	National Wildlife Strategy
OMRH	One Mara Research Hub
PA	Protected Area
PAPF	Protected Area Planning Framework
SDG	Sustainable Development Goals
SNP	Serengeti National Park
SORALO	South Rift Association of Land Owners
TNC	The Nature Conservancy
TOR	Terms of Reference
TANAPA	Tanzania National Parks
TAWIRI	Tanzania Wildlife Research Institute
UN	United Nations
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
USA	United States of America
VU	Vulnerable species
WCMA	Wildlife Conservation and Management Act
WCS	Wildlife Conservation Society
WHS	World Heritage Site
WRTI	Wildlife Research and Training Institute
WRUA	Water Resource Users Association
WWF	World Wildlife Fund

INTRODUCTION AND BACKGROUND

Introduction

The GMME management plan (2023-2032) has been developed in accordance with the Convention on Biological Diversity (CBD) guidelines for the implementation of the ecosystem approach and the Protected Areas Planning Framework (PAPF), the conservation planning standard for protected area and ecosystem plans in Kenya. In line with the CBD guidelines and the PAPF, the key features of the plan are participatory planning, evidence-based decisions, integrated land use management, community benefits from ecosystem services, and adaptive management. Its aim is to ensure coordination and integrated management of the three major components that constitute the ecosystem the Maasai Mara National Reserve (MMNR), the semi-protected area (Conservancies) and the nonprotected area. To achieve this, the plan sets out 10-year stakeholder-agreed vision and goals that will be pursued for the entire GMME, and management objective and actions that will be implemented to achieve these goals.

The planning process

The GMME planning process involved a wide range of GMME stakeholders including, representatives of the local community, National and County Government agencies, Non-Governmental Organizations, Mara Tourism Partners and development partners. These stakeholders participated in the planning process through the following mechanisms: Core Planning Team meetings; Planning Process Launch Meeting; Stakeholder Planning Workshops; information gathering; plan drafting workshops; public participation meetings; plan approval meetings; and plan launch meeting.

The GMME planning process consisted of 12 key steps. These are:

1. Planning Process Launch Meeting
2. Plan Scoping Workshop
3. Information Gathering
4. County Spatial Planning-Ecosystem Management Planning Integration Workshop
5. Stakeholder Planning Workshop
6. Plan drafting Workshops
7. Experts Planning Workshop
8. Public Participation
9. Stakeholder Plan Validation Workshop
10. Plan approval and endorsement meetings
11. Plan Publishing in the Kenya Gazette
12. Plan launch

In addition to the twelve steps/activities/events outlined above, core planning team meetings were held at different stages of the planning process to review planning progress and outputs.

Annex 2 provides a detailed list of stakeholders who have participated in the GMME plan's development, and the specific events that they have contributed to.

Plan Structure

The plan is divided into nine main chapters as summarised in the following paragraphs:

- **Chapter 1: Introduction and background** This chapter introduces the plan, and gives a background on the planning process, plan structure, plan implementers, and key planning considerations, including integration of this plan with other plans, policies and laws. It also outlines how the Ecosystem Services Framework has been applied in the plan to ensure that ecosystem management is focussed on delivery of ecosystem services for enhancement of human wellbeing.

- **Chapter 2: Plan Foundations.** This chapter provides an overview GMME, its location and constituent geographic components based on land use and land tenure. It sets out the stakeholder-agreed GMME Vision Statement, which explains what stakeholders aspire to achieve in the GMME in the 10-year duration of the plan. It also describes the exceptional resource values, and threats to these values and ecosystem integrity.

- **Chapter 3: GMME Zonation Scheme.** This chapter presents the GMME land use zoning scheme which sets out what land uses should occur or not occur in different parts of the GMME. The zoning scheme is aligned with the Narok County Land Use Zoning plan which sets out areas where different land use types are allowed in the County and prescriptions to be implemented in each zone.

- **Chapters 4, 5, 6, 7, & 8: The Five Management Programmes.** The plan has five management programmes that seek to address the stakeholder-identified problems and opportunities in the GMME to achieve the GMME vision and delivery of ecosystem services. These programmes are:

    - **Natural Resources Conservation and Management Programme**
    - **Tourism Development and Management Programme**
    - **Community Livelihoods Programme**
    - **Institutional Collaboration and Governance Programme**
    - **Research and Knowledge Management Programme**

    Each programme includes an overall goal to which management is working towards, and a set of guiding principles that have been considered during programme development and will be adhered to during plan implementation. Under each programme there are management objectives that set out the future desired conditions that each programme aims to achieve and a set of specific management actions to achieve them.

- **Chapter 9: Plan Implementation, Monitoring and Evaluation.** This chapter provides the plan implementation strategy, including institutional and financial arrangements, and the plan monitoring and evaluation mechanisms. It provides an implementation matrix that prioritizes management actions and specifies the lead institutions and partners involved in the implementation of each action. For each action a milestone is identified.

Figure 1 illustrates the GMME plan Structure:

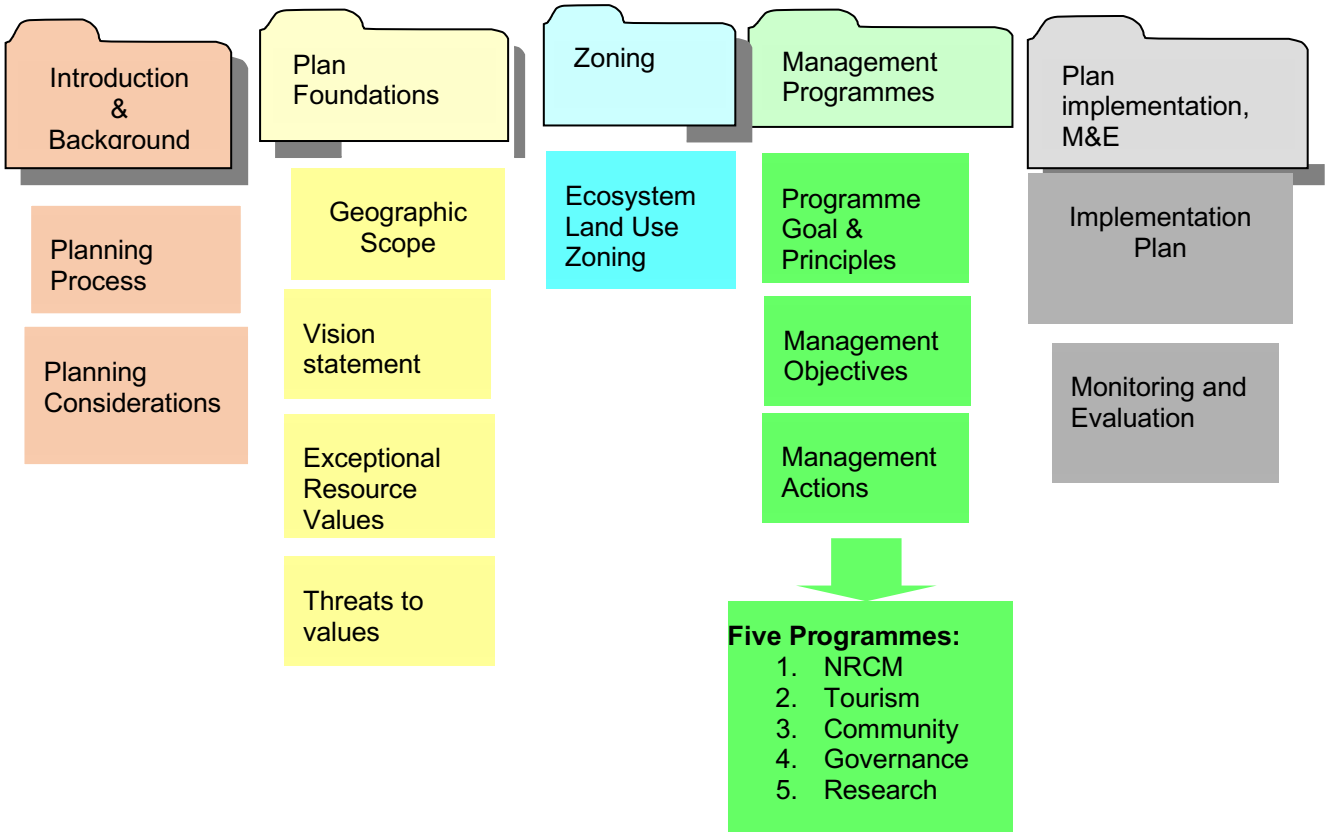


Figure 1. GMME Plan Structure

Planning Considerations

Collaboration in GMME Management

At the plan scoping workshop, stakeholders deliberated on who should be the plan owners of the management plan and agreed that the County Government of Narok (CGN), Maasai Mara Wildlife Conservancies Association (MMWCA), Kenya Wildlife Service (KWS) and the Wildlife Research and Training Institute (WRTI) will be the primary owners. This is because CGN manages Masai Mara National Reserve (MMNR), MMWCA is the umbrella body of the Mara Conservancies, KWS is responsible for coordination of wildlife security and addressing human wildlife conflicts country-wide, and WRTI is legally mandated to conduct and coordinate wildlife research in the country and has been operating a Research Station in the Mara for over 50 years. Other stakeholders will support these primary plan owners in implementing the GMME management plan.

Since the GMME management plan is an integrated plan, its implementation requires a high degree of collaboration between institutions with management jurisdiction over different natural resources in the GMME's constituent components. Such collaboration requires clear allocation of roles and responsibilities for management plan implementation between these institutions, and necessitates agreement on a variety of issues. Therefore, Memorandums of Understanding (MoUs) concerning the implementation of this management plan will be agreed among CGN, MMWCA, KWS, and WRTI.

Integration of the Ecosystem Management Plan with laws, policies and plans

Land use at the County level is legally controlled through the County Spatial Plan (CSP); hence the need for the Ecosystem Management Plan (EMP) to be integrated in the CSP. To ensure the two plans are integrated the following actions were taken by the CSP and EMP Core Planning Teams:

- Using the same land use zoning and terminology
- Using the same spatial data sets
- Addressing the same issues
- Participation of selected CPT members in both processes to ensure the CSP and EMP are integrated

In addition, to ensure that the plan is integrated with higher level plans, policies and laws, wherever appropriate, the GMME plan guiding principles are aligned with international, national, and county laws and policies, as well as relevant institutional plans and programmes of the primary plan implementers (CGN, MMWCA, KWS & WRTI). These laws policies and plans include:

- Convention on Biological Diversity (CBD)
- Ecosystem Approach (CBD Guidelines)
- Sustainable Development Goals
- The Constitution of Kenya, 2010
- Wildlife Conservation and Management Act, 2013
- Tourism Act 2011
- National Tourism Blueprint 2030
- National Wildlife Strategy 2030
- Narok County Spatial Plan (draft)
- Narok County Integrated Development Plan 2018-2022
- Masai Mara Wildlife Conservancies Association Strategic Plan 2021-2025
- Kenya Wildlife Service Strategic Plan 2019 – 2024
- Masai Mara National Reserve Management Plan 2020-2029

Application of the Ecosystem Services Framework in the GMME Plan

Introduction

The GMME plan is also aligned with the Millennium Ecosystem Assessment Conceptual Framework, which emphasizes the significance of human wellbeing as the focal point of sustainable ecosystem management. The conceptual framework functions under the assumption of an existing dynamic between human beings and different components of the ecosystem. The changing human condition functions as the determining variable influencing changes in the ecosystem which ultimately influences change in human wellbeing. Concurrently, other independent environmental factors and natural forces also influence the human condition and the ecosystems. The primary focus is on the interconnectedness of human wellbeing and the ecosystem services (benefits from ecosystems). The conceptual

framework has four components: ecosystem services, indirect drivers, direct drivers, and human wellbeing and poverty reduction (Figure 2).

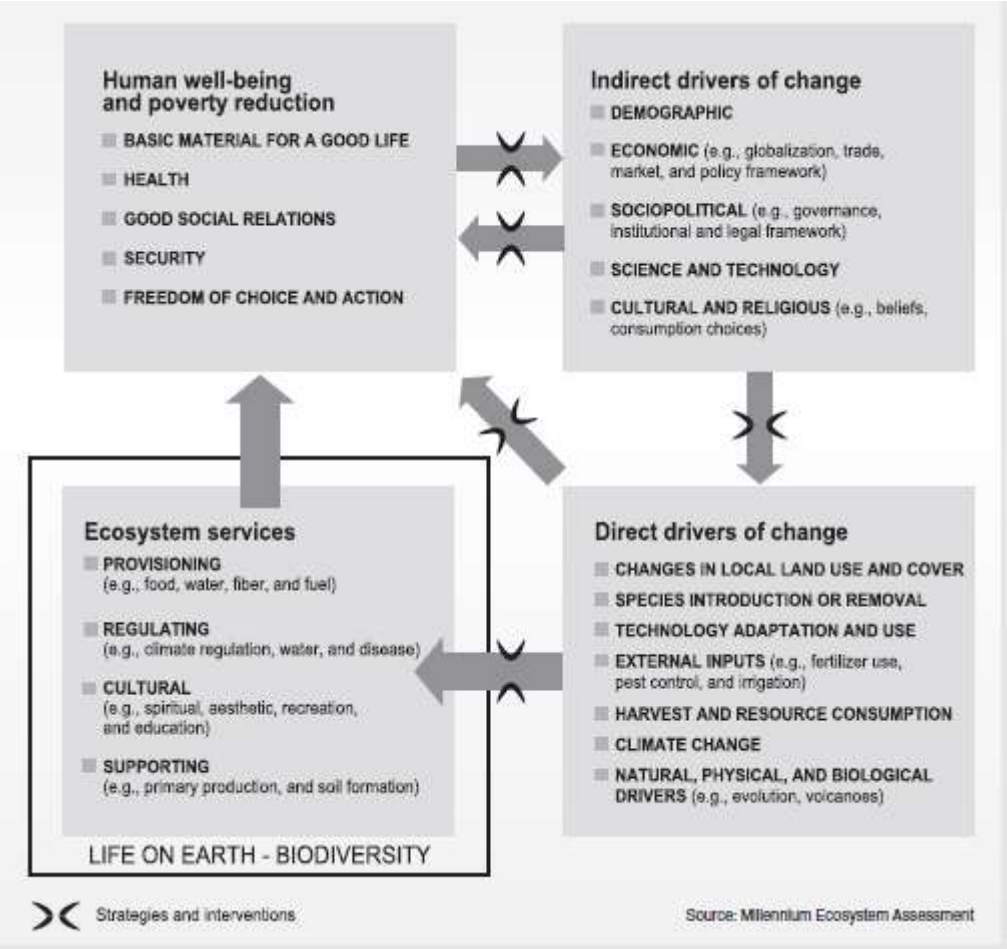


Figure 2. Ecosystem Services Framework. ***Source Millennium Ecosystem Assessment, 2003***

This plan seeks to improve human well-being and reduce poverty in the GMME. For this reason, there is a need to sustainably manage the GMME for delivery of ecosystem services so that the local community's needs from the ecosystem are met. However, there are many drivers of ecosystem change that affect delivery of ecosystem services. These must be addressed to attain the goal of improved human well-being and poverty reduction. Table 1 shows how issues affecting delivery of ecosystem services area addressed in the plan.

Table 1. How issues regarding delivery of ecosystem services have been addressed in the plan

Category of Ecosystem Service	GMME Management Programme	Management Objective
Provisioning	Natural Resource Conservation and Management Programme	MO 1: Rangelands resource management MO 2: Forest resources management MO 3: Water resources Management MO 4: Wildlife Management
	Community Livelihood Programme	MO 4: Livestock management MO 5: Agricultural production

Category of Ecosystem Service	GMME Management Programme	Management Objective
Regulatory and Supporting	Natural Resources Conservation and Management Programme	MO 1: Rangelands resource management MO 2: Forest resources management MO 3: Water resources management
Cultural	Tourism Development and Management Programme	MO 1: Tourism product MO 2: Visitor facilities MO 3: Infrastructure network MO 4: Marketing
	Community Livelihood Programme	MO 1: Community benefits MO 2: Conservation education and awareness MO 3: Human-Wildlife Conflicts management

PLAN FOUNDATIONS

The Greater Maasai Mara Ecosystem

The GMME is a subsystem of the much larger Serengeti-Masai Mara Ecosystem that covers approximately 25,000Km^2 and is globally renowned because of the high concentrations of wildlife and a great wildlife spectacle−the annual migration of over one million wildebeest. It has the highest concentration of wildlife in Kenya, is a priority habitat for conservation of antelopes and covers over 6,600Km^2[1]. The GMME's ecological boundary can be defined based on the movement extent of MMNR's wide-ranging species that can't be contained in MMNR, the only protected area set aside as a wildlife refuge in the ecosystem. Landscape species of note include herbivores, such as elephants and wildebeest, and carnivores, such as lions and wild dogs. The home range of these species is within an area that has diverse land uses including conservation, wildlife tourism, livestock grazing, human settlement and crop agriculture. It's bounded by the Kenya-Tanzania border in the south, the higher potential agricultural land to the north and west (in the Trans Mara plateau) and the Loita forest and escarpment in the east.

Setting the GMME Boundary

The Millennium Ecosystem Assessment Framework offers an approach towards determining an ecosystem boundary. The framework notes that *"a well-defined ecosystem has strong interactions among its components and weak interactions across its boundaries. A useful choice of ecosystem boundary is one where a number of discontinuities coincide, such as in the distribution of organisms, soil types, drainage basins, and depth in a waterbody"*[2]. In view of this, ecosystem boundary was set based on:

- **The Mara elephant range:** The elephant is a landscape species whose range in the Mara covers the home ranges of other wildlife species. It is also a major problem animal in the Mara. There are strong interactions between people and elephants in the ecosystem and weak interactions beyond the ecosystem boundary.

- **The Mara River:** The Mara River is the main source of water for wildlife populations during the dry season. The river and its catchment area were therefore considered while defining the ecosystem boundary.

- **Social interactions:** Social interactions among the local community were also considered. There are strong interactions among the local communities in Narok County and weak interactions with communities beyond the Narok borders, mainly because of cultural differences (in the west and north) and administrative jurisdictions (Kajiado in the east and Tanzania to the south).

- **Human-wildlife interactions:** The Geographic extent of interactions between people and Mara wildlife was also considered. There are positive interactions with the tourism players and negative interactions between crop and livestock farmers.

Based on the above factors, the GMME boundary used in this plan is as shown in Figure 3.

[1] Li, W., Buitenwerf, R., Munk, M., Bøcher, P.K., Svenning, J.C. (2020). Deep-learning based high-resolution mapping shows woody vegetation densification in greater Mara ecosystem
[2] Millenium Ecosystem Assessment, 2003

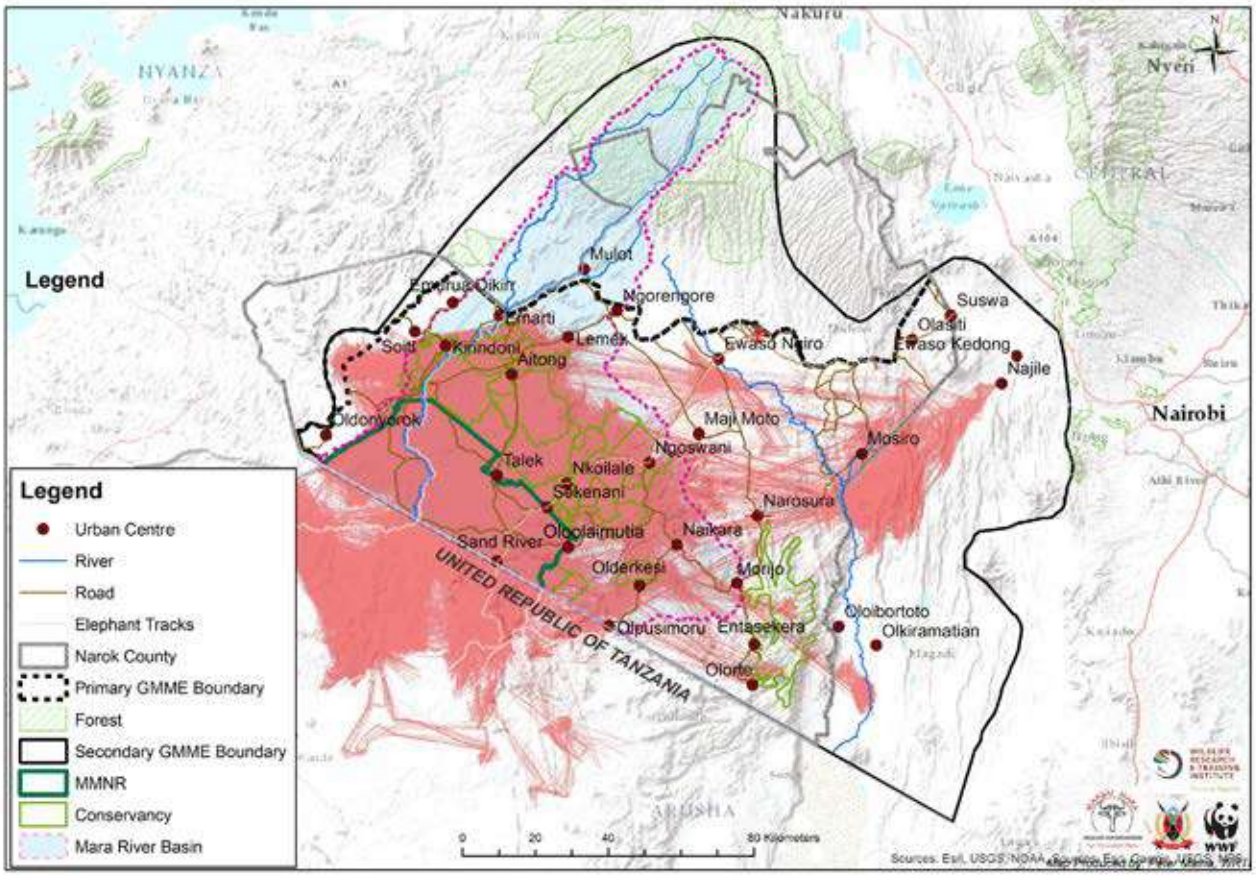


Figure 3. GMME's primary and secondary boundaries as defined by the Mara elephant range and the Mara River catchment area respectively

Geographic components

The GMME can be zoned into three broad geographic components based on land use and land tenure. These are the protected area, *Maasai Mara National Reserve; semi-protected areas (Mara conservancies and Loita Forest); nonprotected area; and an influence zone.* The national reserve is managed by the Narok County Government. The semi-protected area is occupied by group wildlife conservancies where wildlife is protected, and livestock grazing is present but regulated. Nonprotected area is a mix of rangeland, crop agriculture, and settlements and is owned by individuals[3]. The land use in the influence is mainly mixed farming and forestry.

[3] Li, W., Buitenwerf, R., Munk, M., Bøcher, P.K., Svenning, J.C. (2020). Deep-learning based high-resolution mapping shows woody vegetation densification in greater Mara ecosystem

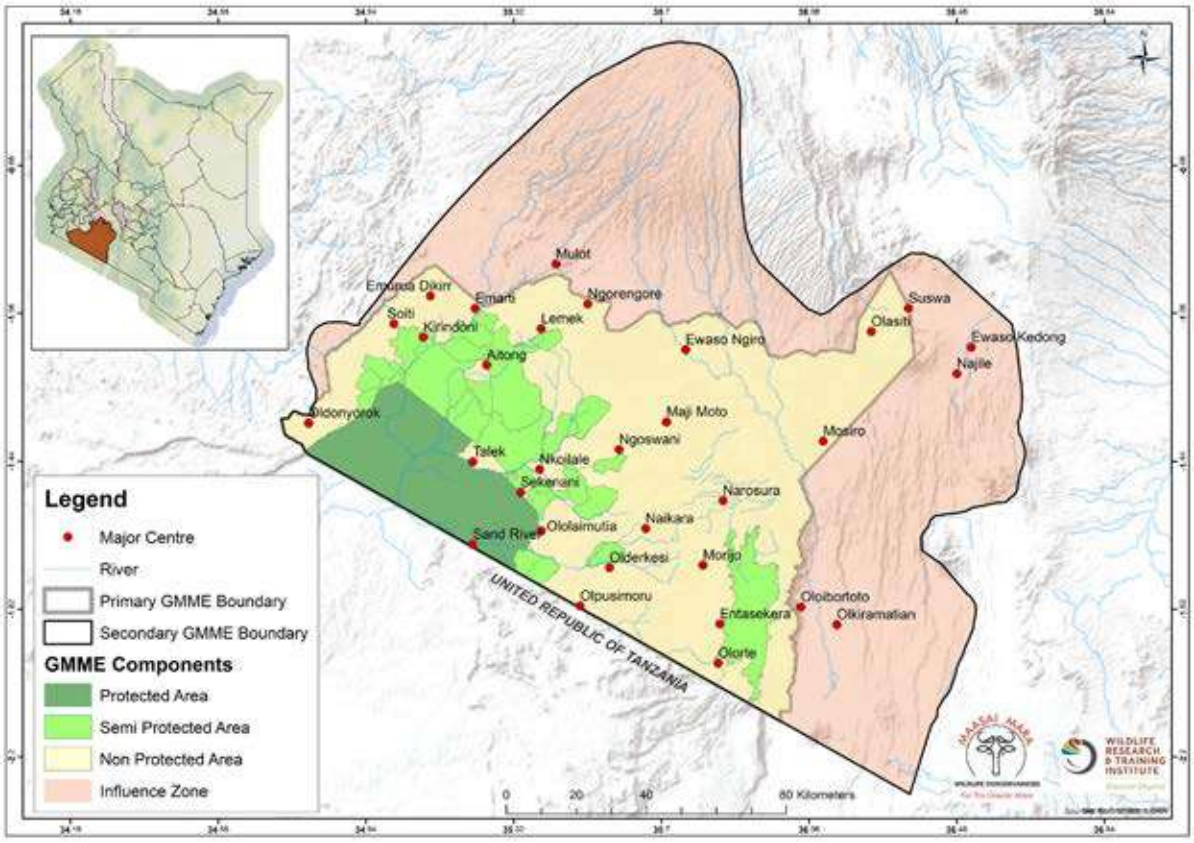


Figure 4. GMME Geographic Components

The following sections provide a brief overview of the GMME's key components.

Protected Area (Masai Mara National Reserve)

MMNR was established through legal notice 271 of 1974. The reserve covers 1510 Km^2 that is enclosed by Boundary Plan 216/50 under the custody of the Survey of Kenya. It is managed by the County Government of Narok and has two management sectors: Narok sector that is Managed by the County Government of Narok, and the Mara Triangle Sector that is managed by the Mara Conservancy LTD on behalf of the County Government.

Semi-Protected Area (Wildlife Conservancies)

Over the past decade, the Narok County group ranches and other communal lands have been undergoing a process of land subdivision and adjudication. Currently, all the group ranches and communal land located in the Mara ecosystem east of the Siria Escarpment have been subdivided into private land ownership except Olderkesi, Narosura and Loita. The two former are already into the early stages of land adjudication. The current conservancies (and those in process) to the north, east and, to some extent, west of the Mara National Reserve (MMNR; Figure 4 and Table 2) have been formed by the leasing and amalgamation of individual land parcels carved out of the ex-group ranches of Koiyaki, Kimintet, Ol Kinyei, Maji Moto, Siana, Olderkesi, Lemek and Olchorro Oirouwa. While this may be financially viable in areas of high tourism revenue, a different model is necessary in outlying yet

ecologically critical areas (e.g. Pardamat, Loita plains, Loita Hills, and Naimina Enkiyio Forest)[4].

Table 2. Conservancies in the GMME and their sizes

Conservancy	*Size in Km² (Estimate)*
1. Enonkishu	**28**
2. Lemek	**58**
3. Ol Chorro Oirouwa	**53**
4. Motorogi	**47**
5. Naboisho	**211**
6. Ol Kinyei	**66**
7. Olare Orok	**92**
8. Siana	**43**
9. Nashulai	**36**
10. Olarro North	**30**
11. Olarro South	**54**
12. Olderkesi	**39**
13. Isaaten	**23**
14. Oloisukut	**82**
15. Nyekweri	**18**
16. Moran	**39**
17. Mara North	**351**
18. Olerai	**9**
19. Pardamat	**242**
20. Isinya	**39**
21. Proposed Olderkesi	**46**
22. Proposed Olpua	**53**

Nonprotected area

The nonprotected areas are the parts of the ecosystem that are outside the conservancies. Some parts of this area are under crop farming (irrigated and rainfed) while others are used for livestock grazing. The area under livestock grazing is used by wildlife but increased fencing in this area limits wildlife use. This area will be the focus for habitat restoration programmes to reclaim the historical wet season wildlife dispersal area.

Influence zone

This area comprises the upper water catchment areas of the Mara River and Ewaso Nyiro River. Crop production through rainfed farming is the predominant land use activity in this area. The area is outside the primary focal area of this plan but it has been included in the ecosystem because of its importance as the catchment of the Mara river, the lifeline of the Mara ecosystem. Stakeholder activities in this area will focus on promoting climate smart agriculture and promoting sustainable management of the water catchment areas.

[4] Poole, J., B. Okita-Ouma, P. Granli, D. Kimanzi, M. Goss, L. Tiller, S. Kiambi, and I. Douglas-Hamilton. (2016). Mara ecosystem connectivity: Information on elephant population status and movements for spatial planning and conservation in Narok County. Pages 1-28.

Vision Statement

This management plan's vision is an inspiring forward-looking statement that describes the planning area as it could be in 10 years as a result of implementing actions and resolving issues related to the important features of the planning area and the way people use the area's resources. Its purpose is to establish common ground among stakeholders on the planning area's overall future desired condition, inspire support for it, and provide an overarching framework for the more specific management objectives.

The GMME vision statement was developed at the Stakeholder Planning Workshop and revised at the Experts Planning Workshop. The vision that stakeholders are aspiring for in the Greater Maasai Mara Ecosystem is:

A healthy and sustainable ecosystem for improved human well-being

This vision is further elaborated in the following five goals, which are also provided at the beginning of each of the five management programmes in this plan.

Goals

The plan has five key goals that it aims to achieve in 10-years. These are:

1. ***To sustainably manage the GMME's natural resources for provision of ecosystem services and other benefits of nature to people to the local community, to the country, and the world in general.***

2. ***To develop sustainable tourism that offers memorable experiences to visitors and is a pillar for biodiversity conservation in the ecosystem.***

3. ***To improve community livelihood through enhanced stakeholder participation in sustainable NRM at the GMME.***

4. ***To strengthen capacity, representativeness and collaboration among locally-led institutions to deliver targeted conservation and development actions.***

5. ***To conduct and coordinate research in the GMME to enable provision of accurate data and information to support decision making***

Exceptional Resource Values

The GMME's Exceptional Resource Values (ERVs) describe the ecosystem's vital natural resources and other features that provide outstanding benefits to local, national and international stakeholders and that are especially important for maintaining the area's unique qualities, characteristics and ecology. The following sections describe the ERVs that have been prioritised by GMME stakeholders. These sections have been set out according to four categories: Biodiversity, Scenic, Sociocultural, and Economic (Table 3).

Table 3. GMME's Exceptional Resource Values

Category	Exceptional Resource Value
Biodiversity	World-famous Wildebeest Migration[5]
	Highest (remaining) wildlife density in Kenya
	Threatened species
	Rhino conservation
	Lion conservation
	Important Bird & Biodiversity Area (IBA) listing
	World Heritage Tentative listing
	Recognition as one of the "Seven Natural Wonders of Africa" and "ten Wonders of the World"
Scenic	Scenic features (Mara, Talek and Sand Rivers hills and escarpments, grassland plains Loita and Nyekweri Forests)
Socio-cultural	The Mara Conservancy Model
	Maasai Culture
	Loita Forest traditional community-based forest governance system
	Archaeological sites
	Wildlife research
	Education
Economic	National Economic benefits
	Local economic benefits

Biodiversity

World-famous Wildebeest Migration

Part of the GMME's key value lies in the spectacular and world-famous annual migration of some 1.5 million wildebeests and 200,000 Burchell's zebras, the defining characteristic of the greater Mara-Serengeti Ecosystem. These migrants use GMME as their dry season range between July and November, while spending the rest of the year in Tanzania, making the conservation of this system also highly dependent on the future conservation management in Tanzania. The GMME had a smaller, separate "northern" migration, Kenya's last migration staying year-round in its country's boundaries, consisting of the same species, mixing with the larger migration in the MMNR between July and September. However, this has been very recently (since 2015) curtailed by increased fencing in the migration area, making migration in the Mara now fully dependent on the animals that spend most of the year in Tanzania, including for reproduction.

[5] A value strongly realized through its spatial setting as a subsystem of the Greater Serengeti-Mara Ecosystem

Highest (remaining) wildlife density in Kenya

The ecosystem has the highest wildlife density in Kenya and the highest species richness in terms of large mammalian diversity in the southern Kenya rangeland ecosystems[67].

Threatened species

The GMME is valued for its ecological biodiversity. It hosts many species classified by IUCN as threatened, including mammalian herbivores, such as Black Rhino *(*CR); Elephant (EN); Masai giraffe *(*EN); Hippopotamus (VU); Cape Pangolin (VU); and mammalian carnivores, such as Lion (VU); Cheetah (VU); Leopard (VU); and Wild dog (CR). Several bird species are also listed as threatened including Secretary bird (EN); African White-backed Vulture (CR); Rüppell's Vulture (CR)*;* Lappet-faced Vulture (EN); White-headed Vulture (CR)*;* Egyptian Vulture (EN); Hooded Vulture (CR); Madagascar Pond-heron (EN); Helmet shrike (NT); and Jackson's Widowbird (NT).

Rhino conservation. The GMME is an important area for rhino conservation and it contains one of only two remaining indigenous black rhino populations in Kenya[8]. It has 52 free ranging black rhinos in MMNR and two Southern white rhinos at Olchorro Oirouwa conservancy under intensive protection.

Lion conservation. The Mara ecosystem hosts about 21% of the country's lion population. A recent national wildlife census found that the ecosystem is home to 556 lions out of 2589 in the country making it the leading ecosystem in terms of lion conservation.

Important Bird & Biodiversity Area (IBA) listing

Mara ecosystem is listed as an IBA by Birdlife International[9]. The ecosystem is particularly unique as it is classified as an IBA in Danger, implying that it needs urgent conservation action[10]. More than 500 bird species are known to occur, including 53 birds of prey, and is also a wintering area for palearctic migrants.

World Heritage Tentative listing

MMNR was included in the World Heritage Tentative List in February 2010. Its inclusion was based on fulfilment of World heritage Site selection criteria (v)[11], (vii)[12] and (x)[13]. Inscription of this protected area presents an opportunity of establishing a transboundary World Heritage Site as Serengeti National Park, which borders the MMNR to the south is already inscribed as a WHS by UNESCO.

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[6]Gordon O. Ojwang', Patrick W. Wargute, Mohammed Y. Said, Jeffrey S. Worden, Zeke Davidson, Philip Muruthi, Erustus Kanga, Festus Ihwagi and Benson Okita-Ouma (2017). Wildlife Migratory Corridors and Dispersal Areas: Kenya Rangelands and Coastal Terrestrial Ecosystems

[7] These ecosystems include: Mara ecosystem; the Eburu Forest and Naivasha-Elementaita-Nakuru lakes ecosystem; Nairobi National Park and the Athi-Kaputiei ecosystem; the South Rift (Magadi and Natron lakes region); the Amboseli and West Kilimanjaro ecosystem, and the Tsavo ecosystem

[8] The other one is in Tsavo East National Park

[9] Important Bird & Biodiversity Areas (IBAs) are sites of international significance for the conservation of the world's birds and other wildlife. All these locations also qualify as Key Biodiversity Areas (KBAs) - sites that contribute significantly to the global persistence of biodiversity

[10] BirdLife International. (2021). Important Bird Areas factsheet: Masai Mara. Downloaded from http://www.birdlife.org on 10/10/2021.

[11] To be an outstanding example of a traditional human settlement, land-use, or sea-use which is representative of a culture (or cultures), or human interaction with the environment especially when it has become vulnerable under the impact of irreversible change;

[12] to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

[13] to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

Recognition as one of the "Seven Natural Wonders of Africa" and "ten Wonders of the World"

The Great Serengeti-Mara wildebeest migration is distinctively recognized as one of the Seven Natural Wonders of Africa, and as one of the ten Wonders of the World[14].

Scenic

Scenic features

The Mara, Talek and Sand Rivers are important for the vital ecological role the rivers fulfil in the area and from a scenic and tourism perspective. This is illustrated by the fact that most of the tourism facilities in the GMME are located on the banks of these rivers, or their tributaries. In addition, the GMME landscape comprises of scenic rolling plains interspersed with equally picturesque hills and escarpments that offer strategic viewing points.

Sociocultural

The Mara Conservancy Model

The Mara conservancies have a reputation for promoting a low-volume high-value tourism model. This is predominantly based on the low tourist densities, controlled by number of beds per hectare, and a strict code of conduct for operators regarding key elements of a guest experience, such as quality of safari vehicles and guide training. Generally, higher standards of eco-friendly methodologies and tourism infrastructure also reinforce these positive elements[15].

Maasai Culture

In the Greater Mara, the communities' semi-nomadic culture focused on livestock rearing and semi-permanent family villages constructed from natural material has maintained an open landscape where people, livestock and wildlife are free to roam. Indeed, traditional beliefs towards wildlife have further enhanced a generally peaceful and mutually beneficial co-existence between people, wildlife and the land.[16] The conservancies are a testament of the local communities' commitment to ecosystem conservation for improvement of human well-being.

Loita Forest traditional community-based forest governance system

Respect of the traditional governance of Loita Forest has ensured that the forest remains intact and continues to offer ecosystem services to the community. Given the success registered by this traditional community-based forest governance system, it should be supported to continue managing the forest sustainably.

Archaeological sites

It has two known archaeological sites at Ngamuriak and Narosura. Ngamuriak is located 3 kilometres east of the Lemek. Radiocarbon dating indicates that the site was occupied between the years 198 BC to 59 AD. The artefacts that were excavated from Ngamuriak vary

[14] http://sevennaturalwonders.org/africa/
[15] MMNR Draft Management Plan, 2009
[16] Mara Conservancies CNR-CAP, 2015

from stone tools which contained obsidian blades or fragments, pottery sherds, and numerous faunal and charcoal remains. Narosura site is located at the close to Narosura centre. The site was occupied between 870±115 and 460±110 B.C. A large amount of stone artefacts, pottery and animal bones and teeth were recovered. There were also grinding stones, pestle-rubbers, bone implements, broken stone bowls and fragments of polished stone axes[17].

Wildlife research

The GMME has a Research Station established in the MMNR in 1975. This station has a wealth of wildlife monitoring data[18] spanning five decades and a herbarium consisting of a collection of plant species in the region. It conducts and coordinates wildlife research, and collates information from both local and international researchers to inform conservation decisions.

Education

The ecosystem receives a very high number of organized groups from schools in the country and it is therefore a key centre for ecological learning.

Economic

National Economic benefits

The MMNR is one of the most renowned and most visited protected areas in Africa, and it contributes to significant economic benefits for the Narok County through visitor entrance fees and accommodation licenses. In addition, as a result of the MMNR's international reputation as one of the best wildlife viewing areas in Africa, the MMNR is also a vital driver for tourism at the national level. The Reserve is one of the primary reasons that many visitors come to Kenya (rather than an increasing variety of other beach or wildlife destinations) and provides a unique selling point around which businesses can promote and package visits to other protected areas and accommodation facilities across the country. As a result, the MMNR is pivotal in supporting and sustaining the economic benefits that the nation receives from tourism[19].

Local economic benefits

Local communities in the GMME derive their livelihoods from its ecosystem services. For instance, the community has established wildlife conservancies primarily to capitalise on the opportunities presented by cultural services such as tourism. The County Government of Narok also invests 19% of the revenue from MMNR in the GMME in form of community development and social projects. In addition, the GMME community benefit through employment in the local wildlife conservation and tourism industry.

[17] Odner, K. (1972). Excavations at Narosura, a Stone Bowl Site in the Southern Kenya Highlands, Azania: Archaeological Research in Africa, 7:1, 25-92, DOI: 10.1080/00672707209511557

[18] But the main wealth of monitoring data is in the custody of the Department of Resource Surveys and Remote Sensing (DRSRS)

[19] MMNR draft management plan, 2009

Threats to ecosystem values and biodiversity

The key direct threats to GMME values are: fencing, deforestation, declining Mara River flow, charcoal burning, human-wildlife conflict, agriculture land use, poaching, unplanned settlements and urbanization, unsustainable livestock grazing, infrastructural developments, invasive species, and climate change effects. These threats are discussed in the following sections, while management actions to address them are discussed under the zoning and the five management programmes.

Fencing

Analysis of data collected over the last 40 years by the Directorate of Resource Surveys and Remote Sensing (DRSRS) revealed that fencing of land after its privatization and subdivision has led to the total collapse of the main wildebeest migration from the Mara River to the Loita Plains. The original calving area of the Loita migration is completely fenced for livestock, and so is no longer accessible for migration. The data revealed that the Mara-Loita migrants were abundant over almost one-third of the entire Loita Plains in the wet season in 2011. However, they had been decimated or displaced from the Loita Plains by a combination of rising human population size, settlements, agriculture, fences and other pressures from within and outside the Loita Plains by 2016 (Figure 5). By 2020 fences had covered more than half of the Loita Plains and most of the former wet season hotspots of migrant wildlife. Fences continue to proliferate and become denser from the Ngorengore shopping centre through the Mara-Loita migrants' prime calving areas and spread to the southeast past Maji Moto. Gardner et al. (1987[20]) predicted that the ease of movement of animals through a connected landscape is rapidly lost when 30–50% of the landscape has been converted to uses incompatible with animal movement as is the case with the Loita plains.

The adverse effects of fencing are not only limited to wildlife but also extend to livestock. Fencing reduces mobility and access to water and grazing range available to livestock with negative consequences for the livelihoods of the local pastoral community (Said et al. 2016[21]). The high density of fences and settlements increases the vulnerability of both wildlife and livestock to recurrent severe droughts, human-wildlife conflicts, and diseases.

[20] Gardner, R. H., Milne, B. T., Turner, M. G., & O'Neill, R. V. (1987). Neutral models for the analysis of broad-scale landscape patterns. Landscape Ecology, 1, 19–28.
[21] Said, M.Y., Ogutu, J.O., Kifugo, S.C., Makui, O., Reid, R.S, and de Leeuw, J. (2016). Effects of extreme land fragmentation on wildlife and livestock population abundance and distribution. *Journal for Nature Conservation*, **34**: 151-164

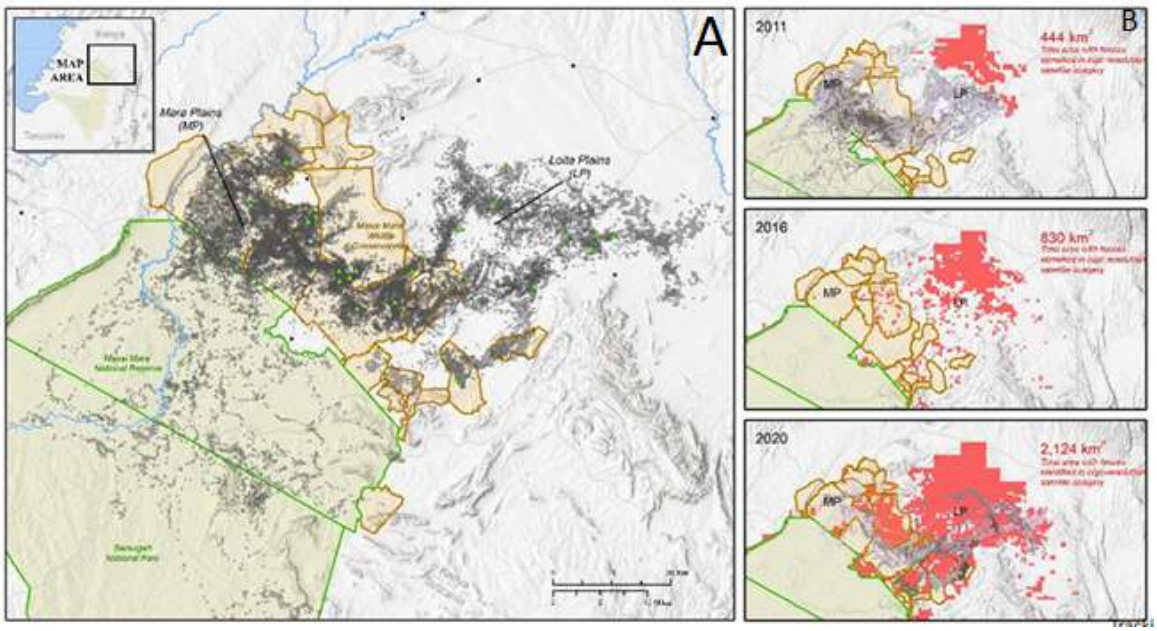

Figure 5. Expansion of fences in the GMME between 2011 and 2020

(A) black lines highlight the movements of wildebeest in the Mara Ecosystem (B) expansion of fences between 2011 and 2020 and blockage of Loita wildebeest movements. Map source: (Kifugo et al. in prep[22]).

Deforestation

In the Greater Maasai Mara Ecosystem, three main forests provide diverse ecosystem services. These are the Mau Forest Complex (MFC), Nyekweri and Loita Forests. The MFC forms the largest closed-canopy forest ecosystem in Kenya, and the largest indigenous montane forest in East Africa[23]. This forest forms the catchment of the main rivers that provide water to the western part of the country and the transboundary Mara River. However, notwithstanding its vital ecosystem services, it is threatened by deforestation recording a 30% loss of forest cover and a 200% increase in agriculture from 1973-2000 [24].

Nyekweri Forest, the largest remaining forest in Transmara, and crucial to elephant dispersal (famously known as the elephant's maternity) from the Maasai Mara National Reserve is nearing extinction. It is a hotbed of deforestation with alarming levels of charcoal production and illegal logging.

In the GMME, it is only the Loita Forest that is still largely intact. The Forest, also known as the Forest of the Lost Child, is an upland forest directly adjacent to the plains of the Maasai Mara. It serves as an important dry season grazing zone, a source of numerous rivers, and is home to a wide array of fauna and flora. However, it is also facing deforestation through encroachment by agriculture and illegal logging and charcoal burning.

[22] Kifugo, S. C., Ogutu, J.O., Said, M.Y., Ojwang, G.O., Hopcraft, H., Olff, H. (in prep),

[23] BirdLife International (2013). Deforestation in the Mau Forest, Kenya, is impacting wildlife and people. Downloaded from http://www.birdlife.org on 30/09/2021

[24] Mati, B. M., Mutie, S., Gadain, H., Home, P. & Mtalo, F. (2008). Impacts of land-use/cover changes on the hydrology of the transboundary Mara River, Kenya/Tanzania. Lakes and Reservoirs: Research and Management 2008 13: 169–177.

Declining Mara River flow

Water constitutes a critical aspect that determines the long-term viability of livelihoods and wildlife and represents a vital element for the annual migration of wildebeest during the dry season. The Mara River is the most important source of water in the GMME. With a length of 395 km, the Mara River is a principal perennial water source that rises in the Mau Escarpment, flowing down through the MMNR and crossing part of the Serengeti National Park in Tanzania before discharging in Lake Victoria[25]. Yet despite its importance to the local communities, livestock and the tourism sector, particularly during the dry season, evidence indicates that the rivers' flow is declining, particularly during the dry season[26]. The changing land use patterns (settlements and agriculture), increased effluent discharges and climate variability affects water volumes. To maintain adequate water flow for all users downstream, there is a need to rehabilitate the degraded water catchment areas and regulate water use.

On the other hand, to provide wildlife with alternative water sources, particularly during the dry season, the Republic of Tanzania is in the process of expanding Serengeti National Park to include Speke Gulf and thereby create a wildlife corridor facilitating permanent access to the water of Lake Victoria which could be crucial in the event of drought[27]. This decision has been taken in response to the uncertainty of the Mara River continuing to carry sufficient water in the dry season due to the destruction of the Mau Forest. This can potentially lead to a strong shift in the migratory patterns, a reduction in the number of the Serengeti migrants visiting the Mara and their residence time in the Mara, thus causing a big loss of ecotourism revenue in the Mara that is underpinned by the dry-season migration to this area (June - October)[28]. Therefore, there is a need for implementation of practical and deliberate policy and management measures to ensure that Mara River's water flow, is stable.

Charcoal burning

Charcoal is one of the most important commodities in sub-Saharan Africa, with as much as 80% of the urban population in the East Africa region using charcoal as their primary energy needs for cooking due to its cost effectiveness, efficiency, and portability[29]. With increased urbanization coupled with rapid population growth, of the middle to lower income groups, the demand is projected to grow in the coming decades[30].

In Narok, the forests and the rangelands are the most vulnerable areas for the exploitation of fuelwood and for charcoal. For example, charcoal burners have wiped out 75 per cent of the forest cover on the Kimintet side of Nyekweri forest, with more trees being felled every day. Some of the reported impacts of charcoal production in the area include degradation of catchment areas leading to decline in water levels in rivers originating from the area.

Most of the charcoal burning in the GMME takes place in the nonprotected areas (Figure 6). Given the importance of these areas as dispersal areas for Mara wildlife, there is a need to control charcoal burning to avert habitat degradation.

[25] Mara Conservancies CNR-CAP, 2015
[26] Kihwele, E. S., M. P. Veldhuis, A. Loishooki, J. R. Hongoa, J. G. C. Hopcraft, H. Olff, and E. Wolanski. (2021). Upstream land-use negatively affects river flow dynamics in the Serengeti National Park. Ecohydrology & Hydrobiology 21:1–12
[27] https://whc.unesco.org/en/soc/4138
[28] Ogutu, J. O., Kifugo, S.C., Senteu, J. S., Obath, C., Amoke, I., and Olff, H. (2021). Reversing the disintegration of the Mara Ecosystem: A feasibility study.
[29] Haysom, S., McLaggan, M., Kaka, J., Modi, L., Opala, K. (2021). BLACK GOLD The charcoal grey market in Kenya, Uganda and South Sudan. Global Initiative against Transnational Organized Crime.
[30] Ndegwa G, Sola, P., Iiyama M, Okeyo I, Njenga M, Siko I., Muriuki, J. (2020). Charcoal value chains in Kenya: a 20-year synthesis. Working Paper number 307. World Agroforestry, Nairobi, Kenya. DOI http://dx.doi.org/10.5716/WP20026.PDF

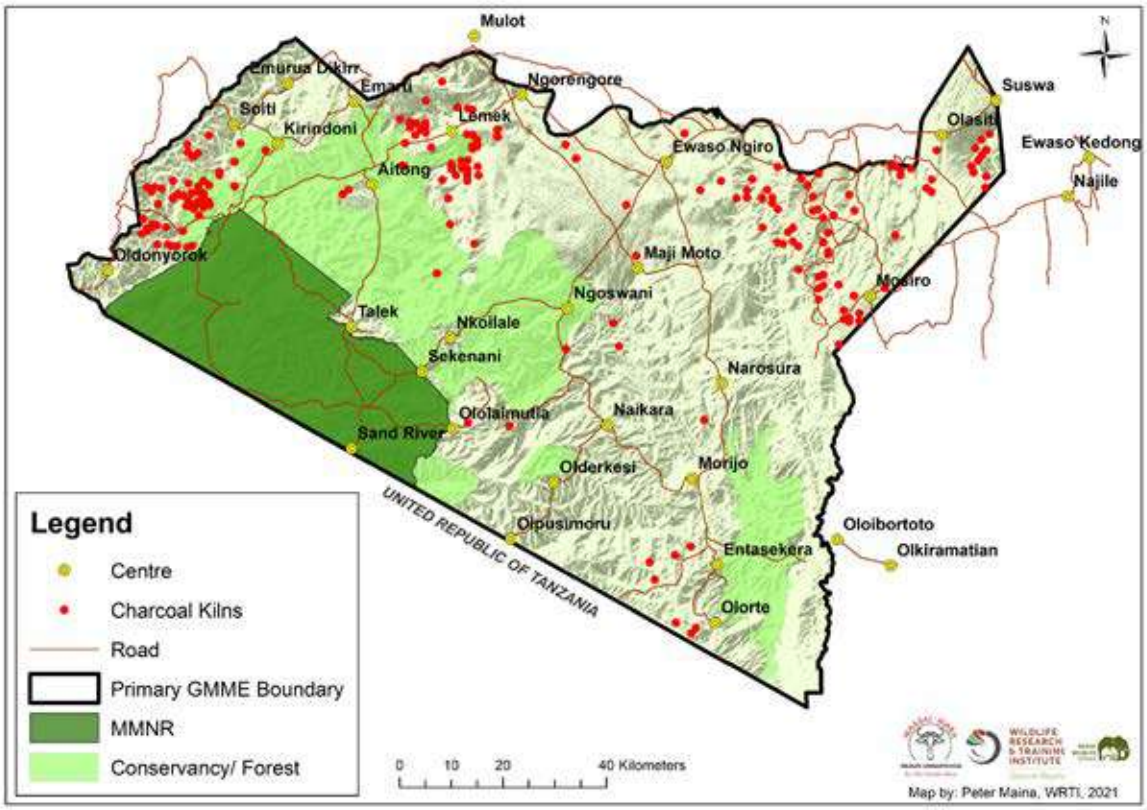

Figure 6. Distribution of charcoal kilns

Human-wildlife conflict

Human-wildlife conflicts (HWC) are increasing in many human-dominated landscapes. They are primarily driven by human population expansion, climate change and variability, land use change and the associated habitat degradation, fragmentation and loss[31]. An analysis of Narok County human-wildlife conflict data from 2001 to 2017 shows that 13,848 conflict incidences were recorded in the county. The elephant contributed the most to conflict incidences (46.2%) followed by nonhuman primates (11.7%). Contributions of two large herbivores, the buffalo (10.6%) and zebra (7.6%), ranked third and fourth, respectively. The giraffe (0.1%) caused the fewest conflicts. The three most common large carnivores in the GMME (i.e. lion, leopard, and spotted hyena) jointly contributed 16.4% of HWC incidents. However, the most serious type of HWC threat to human life. Between March 2014 and 2017 Narok County recorded 51 deaths and 155 injuries.

Areas highly affected by crop destruction majorly consist all areas under agriculture including Nkuta, Entiapirri, Ngimba, Mutorok, Lemek, Siyapei, Ntulele, Ngoswani, Nkoilale and Langata. Livestock predation hotspots are; Ledama area, Olkiramation, Kikuro, Shompole, Pakashe, Naikarra, Olderkesi, Narosura, Suswa, Oloorkisale, Munyas, Emultoto, Olepolos, Olkeri and Marianyi, while threat to human life hotspots include; Soitamurt, Maji Moto, Morijo-Loita, Naikara, Narosura, Shompole and Olkiramatian.

Increased human population, unplanned settlements, agriculture and subsequent fencing have blocked off crucial wildlife corridors and dispersal areas culminating in increased cases of human-wildlife conflicts. Settlements have attracted carnivores (lions, leopards and

[31] Mukeka J.M., Ogutu J.O., Kanga E., and Røskaft E., 2019. Human-wildlife conflicts and their correlates in Narok County, Kenya. Global Ecology and Conservation. Volume 18

hyenas) closer to livestock bomas whilst increasing livestock injury and predation. The expansion of agriculture into wildlife habitats has resulted in crop damages. Escalating HWC is resulting in food insecurity and threat to life without commensurate benefits to the landowners. Most conflicts within the landscape occur due to water shortage and hence occur around water sources (elephants). Land conversion to agriculture along rivers/ streams, which are traditional wildlife corridors and dispersal areas, have led to a spike in crop raiding cases and subsequent retaliatory killings by the local community.

In combating human-wildlife conflicts, Kenya wildlife Service in collaboration with conservation actors within the region, is employing the following measures:

- Scaring of wildlife using blanks, and in some cases, eliminating notorious wildlife
- Compensation of genuine cases based on the compensation guidelines set out
- Tracking carnivores and warning herders on their location
- Assisting in covering funeral expenses emanating from wildlife death
- Creation of awareness and education
- Employment of Scouts and ambassadors
- Deployment of predator deterrent lights around bomas in HWC hotspot areas (Figure 7)

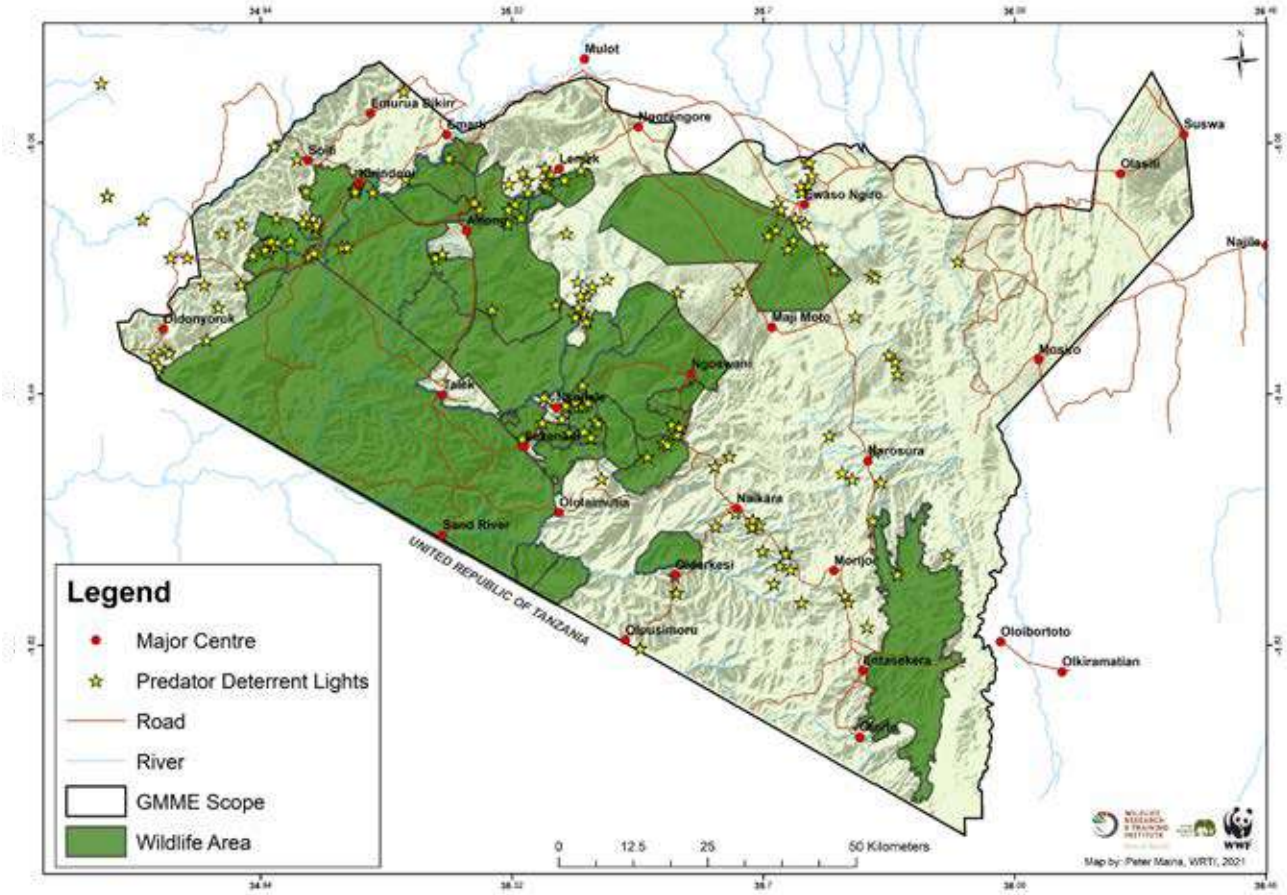

Figure 7. Some of the installed Predator deterrent lights within GME

Agriculture land use

The entire Mara Ecosystem has recorded considerable vegetation changes since the beginning of the twentieth century, changes that strongly accelerated during the last

decades. The most affected area in the ecosystem is the Loita Plains, mainly due to agricultural expansion. Land conversion to large-scale cultivation started in 1975 in Lemek and Osupuko/ Ololunga Group Ranches and spread out in 1985 into Ewaso Ngiro and the Narok area. In 1975, an area of 4875 ha north of the Ngorengore–Ololunga road and in the Mau Uplands was cultivated[32] and by 1985 additional 11, 000 ha were converted further to large-scale wheat growing.

The agricultural expansion increased steeply between 1985 and 1995 where a total area of about 50 000 ha was put under wheat farming. Expansion continues, as was ascertained in a more recent survey in 2015 which reported agricultural area to have increased to 360000ha in the Mara Ecosystem[33]. The wheat farms occupy the former wet season range for the resident wildebeest population of the Mara.

Expansion of agriculture has a huge implication on conservation in the Greater Maasai Mara landscape. This is being influenced by land ownership and its effects on control, access and use. Most of the land within the ecosystem was under group ranches and conservancies. However, land subdivision to private parcels has exacerbated land use changes based on competitive land uses and potential economic benefits to land owners. For instance, there are less benefits accruing from group ranches/ conservancies than leasing land for agriculture.

Currently, large tracts of land in Narok's rangelands have been cleared to pave way for dry land and irrigated farming. Large-scale farming of wheat, maize and sorghum has dominated the fertile plains with moderate rainfall. These areas happen to be the formerly productive grounds for biodiversity conservation and livestock production. Irrigation farming is common along rivers and streams which are the traditional migratory routes for wildlife especially elephants. This has therefore created human wildlife conflict hotspots (crop destruction and human injury/ death) especially during migration. Areas under irrigation within the landscape include; Mosiro irrigation scheme, Ololung'a, Motony, Emonjoy, Munyas, Olchoro Losoit, Ngoswani, Maji Moto, Tiamanengin, Entasekera, Embuakita/ Entiapirri and Narosura. Other areas are; Elangata Enterit, Isineto (Suswa), Eremit, Nguruman and Parkashe irrigation schemes, Leakey irrigation farm, Leshuta, Olderkesi (Olderkesi Development Program) and Nkineji areas.

Poaching

Wildlife security is a major concern in the greater Mara landscape. Poaching for trophies (elephants) and bushmeat (medium and small game) for subsistence and commercial use requires constant address. Trophy poaching has greatly reduced due to concerted efforts by KWS and other conservation agencies in the area. Bushmeat poaching for commercial use is rampant in Suswa and Ewaso areas. The market for bushmeat is increasing due to mushrooming settlements near the MMNR, new migrants, and poverty. However, there are a few cases of elephants' death by locals as a result of retaliatory killings due to crop raids.

Unplanned settlements and urbanization

Increase in human population in the GMME has led to land conversion and increased urbanization, which has increased the demand for water, food, energy and infrastructure

[32] Karime, O. N. I. (1990). The changing land use patterns in the Ngorengore Loita plains. Department of Resource Surveys and Remote Sensing, Ministry of Planning and National Development, Kenya.
[33] Said, M.Y., Kifugo, S., Kija, H., Ojwang, G., Ojwala, M., May, R., Graae, B.J., Nielsen, M., Hartsteen, H. P., Odeck, J., Nzunda, E., Olff, H., Ogutu, J., and Verones, F (2019). Quantitative Modelling of Land Use. AfricanBioServices.

development[34]. The increase in population has contributed immensely to the increase in scattered and unplanned peri-urban centres. Developments along the main roads, such as the recently tarred Narok-Sekenani road have also increased. The increase in alternative land use has also led to the need for certain specialized industry services to be provided in a central location. Investors and entrepreneurs from within and outside the local community have responded to the demand for these services. With no rural-urban planning in place, this has led to a disorganized flurry of development in the peri-urban pockets. These rural-urban sprawls detract from the open landscape needed for wildlife and as the basis for the traditional Maasai way of life[35]. In the heart of the GMME five towns are now very rapidly growing: Mara Rianta, Talek, Sekenani, Oloolaimutia and Nkoilale. This leads to growing problems with drinking water, pollution from sewers and overall wildlife disturbance, impairing the promise of future ecotourism revenues that accelerated the development of these towns in the first place. Spatial planning is urgently needed to evaluate and potentially control these rapid developments[36].

Unsustainable livestock grazing

The Maasai traditional grazing systems have undergone a fundamental transformation over time. There were dry and wet season grazing areas governed and controlled by a group of elders. These systems have been affected by rising human population and migration of people from outside the ecosystem, land pressure and land subdivision from group ranches to privately owned land.

Lack of information on sustainable stocking rates, quality livestock breeds and investment opportunities have led to overstocking, overgrazing, habitat degradation, and low investment returns from livestock keeping. Over the years, livestock numbers continue to increase, hence exerting pressure on the grasslands within the greater Mara landscape. Fencing has also contributed to overgrazing due to enclosing large livestock units in a small area over time. Overgrazing has caused decreased herbaceous vegetation cover, especially in open access areas. The high densities of livestock in the Greater Mara Landscape impacts negatively on vegetative cover, which affects wildlife productivity and movement. Loita plains are currently under threat due to serious habitat degradation leading to loss of vegetative cover and gulley and sheet soil erosion. The situation is particularly severe during the dry season with wildebeest, zebra, impala and other ungulates being highly affected. These dynamics force wildlife and livestock to move to MMNR in search of pasture, exerting more pressure on vegetation.

There is a need to sensitize the communities practising pastoralism on ideal stocking rates, high yielding modern breeds, and sustainable grazing practices to prevent rangeland degradation.

Infrastructural developments

Infrastructure expansion is most of the time an indicator of economic growth. However, this is not always the case where such infrastructures are not compatible with biodiversity conservation. Hence proper planning is required to evaluate the potential impacts of infrastructures like roads, towns and associated amenities.

[34] USAID (2019). Vulnerability and Adaptation in The Mara River Basin. https://www.climatelinks.org/projects/atlas
[35] Mara Conservancies CNR-CAP, 2015
[36] Ogutu, J. O., Kifugo, S.C., Senteu, J. S., Obath, C., Amoke, I., and Olff, H. (2021). Reversing the disintegration of the Mara Ecosystem: A feasibility study.

GMME faces unplanned but mushrooming rural and urban centres that gradually become permanent necessitating the provision of associated social amenities, such as schools, health facilities and markets. These grow with tourism facilities, some of which are constructed in environmentally sensitive areas, adversely affecting biodiversity conservation.

Road networks connecting these urban areas disturb wildlife habitats through frequent movement, noise, and dust (Figure 8). The recent tarmacking of the Narok-Sekenani Gate road has, for instance, led to increased sedentarisation and urbanization along the highway, which inhibit wildlife movements and migration. Cases of wildlife injury and mortality from speeding vehicles have increased over the recent past according to informal records.

Infrastructural developments should be environmentally sensitive to avoid habitat degradation and fragmentation. Developments should be based on the County Spatial Plan guidelines to minimize unplanned and unnecessary developments.

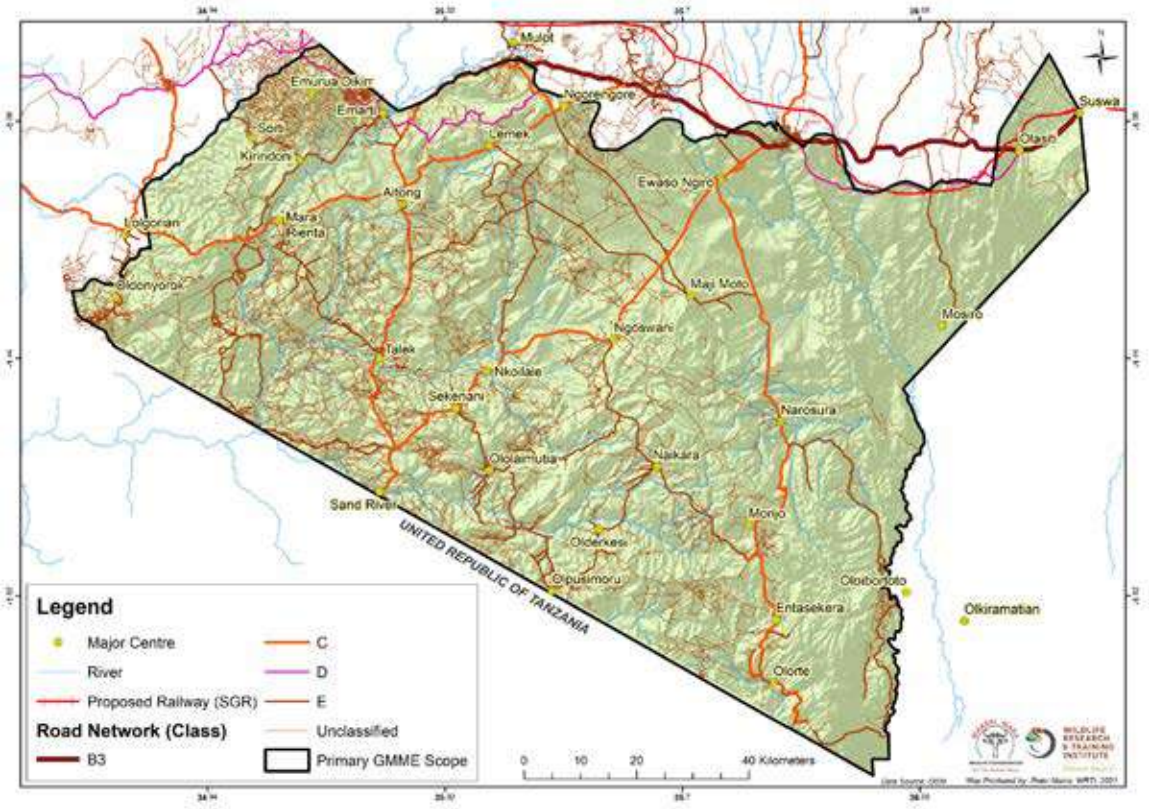

Figure 8. Road network

Invasive species

Invasive plants are considered as one of the major threats to biodiversity conservation and cause significant problems to ecosystems and landscapes, threatening biodiversity by altering ecological structure and functions, including reducing overall habitats and species abundance and diversity. They also reduce overall productivity and increase production costs in community farms. It is therefore important to adopt a relevant strategy to prevent new invasions, enhance surveillance in early detection, rapid response to new invasions and proper management of established and spreading invasive species. However, it's prudent to roll out intensive education and awareness campaigns on invasive species to protected area managers and farmers.

Six invasive species in the GMME are aggressive and can potentially reduce rangeland productivity and affect grazers due to their allelopathic / toxic nature (Table 4)[37]. These species are summarised in the table below;

Table 4. Aggressive invasive species in the GMME

No	Invasive Species	Brief Description
1	*Chromolaena odorata*	a shrub from Central America
2	*Lantana camara*	a shrub from Central and South America
3	*Opuntia stricta*	a spinescent cactus from Central America
4	*Parthenium hysterophorus*	an annual herb from tropical America
5	*Prosopis species*	trees and shrubs from North, South and Central America
6	*Tithonia diversifolia*	a shrub from Central America.

Sand harvesting and pollution

Mining is an important economic activity for both Narok and Kajiado Counties to which GMME sprawls. Sand harvesting occurs along the valleys of both permanent and seasonal rivers of the Mara. It supports construction industry in Narok and its surrounding areas including Nairobi. Major sand harvesting areas are Naikarra, Siana, Maji Moto, Talek[38] (Narok) and Ewuaso (Kajiado).

However, sand harvesting has detrimental environmental impacts as it destroys riverine vegetation, accelerates erosion of river banks, and changes aquatic and semi-aquatic biodiversity. Removal of sand causes siltation, which may in turn trap wildlife when drinking water or crossing. It also reduces the sand's water holding and retention capacity affecting water balance during the wet and dry seasons. As a result, rain water flashes fast across the river channels during the wet season but they dry fast due to the lack of sand to retain it. This has a catastrophic effect on biodiversity, livestock and human populations who depend upon the rivers for survival.

Cases of poaching (trophies and bush meat) have increased over time in sand harvesting areas whereby trophies, game meat and illegal forest products are transported by lorries[39] and ultimately finding their way to markets, such as Naivasha and Burma (Nairobi) among other towns.

Water pollution along rivers has been an environmental concern, especially due to increasing agricultural activities in the GMME. Major pollutants are pesticides applied on farms that drain into river channels during rainy seasons. Over time, traces of these chemicals accumulate and cause temporary or permanent changes to biodiversity and their ecosystems. Other causes of pollution include towns near rivers (Narok) especially those with poor liquid and solid waste management. For instance, Ngoswani Centre is highly polluted by plastic and polythene bags.

Climate change effects

In recent times the rainfall patterns of the Mara have become increasingly erratic. Drought is more pronounced, while drought periods are increasing in duration and severity. A reduction in surface water availability has direct impacts on both wildlife and livestock populations. It substantially elevates mortality rates while drought results into more robust age groups

[37] Witt A., Kiambi S., Beale T., and Wilgen B. (2017). A preliminary assessment of the extent and potential impacts of alien plant invasions in the Serengeti-Mara ecosystem, East Africa. Koedoe - African Protected Area Conservation and Science
[38] Maasai Mara Conservancies CNR-CAP (2015)
[39] ibid

surviving, thereby producing an unnatural skew in the population age structure. Erratic weather patterns will also aggravate other threats. For instance, habitat fragmentation due to land use changes limits access to dry season grazing and water on which cattle and wildlife depend. Climate change will exacerbate this threat as the increased frequency and severity of droughts and floods that is expected to occur will modify vegetation growth and hence food availability for the migrating animals. The ability of migrants to respond to changing climatic conditions is likely to be further impaired by man-made threats such as habitat loss and land fragmentation. It is therefore postulated that further changes in rainfall patterns and periodicity will have severe implications for the wildlife of the GMME. For example, wildebeest numbers are significantly affected by rainfall in the dry season as it directly influences food availability. This, in turn, directly affects predator numbers and survival rates.

This plan addresses climate change impacts through several actions that are discussed under its five management programmes.

GMME LAND USE ZONING

Introduction

To achieve the GMME's conservation, tourism, and community livelihoods management objectives, a land use zoning plan consisting of six (6) zones has been developed (Figure 9). The land use zones are:

- **Conservation and Tourism zone**
- **Conservation, Tourism and livestock Grazing zone**
- **Livestock Grazing zone**
- **Agriculture zone**
- **Urban Centres zone**
- **Influence Zone**

The GMME land use zoning map and zone descriptions are provided in the following sections. Where multiple functions are listed per zone, these functions will be managed to coexist with each other.

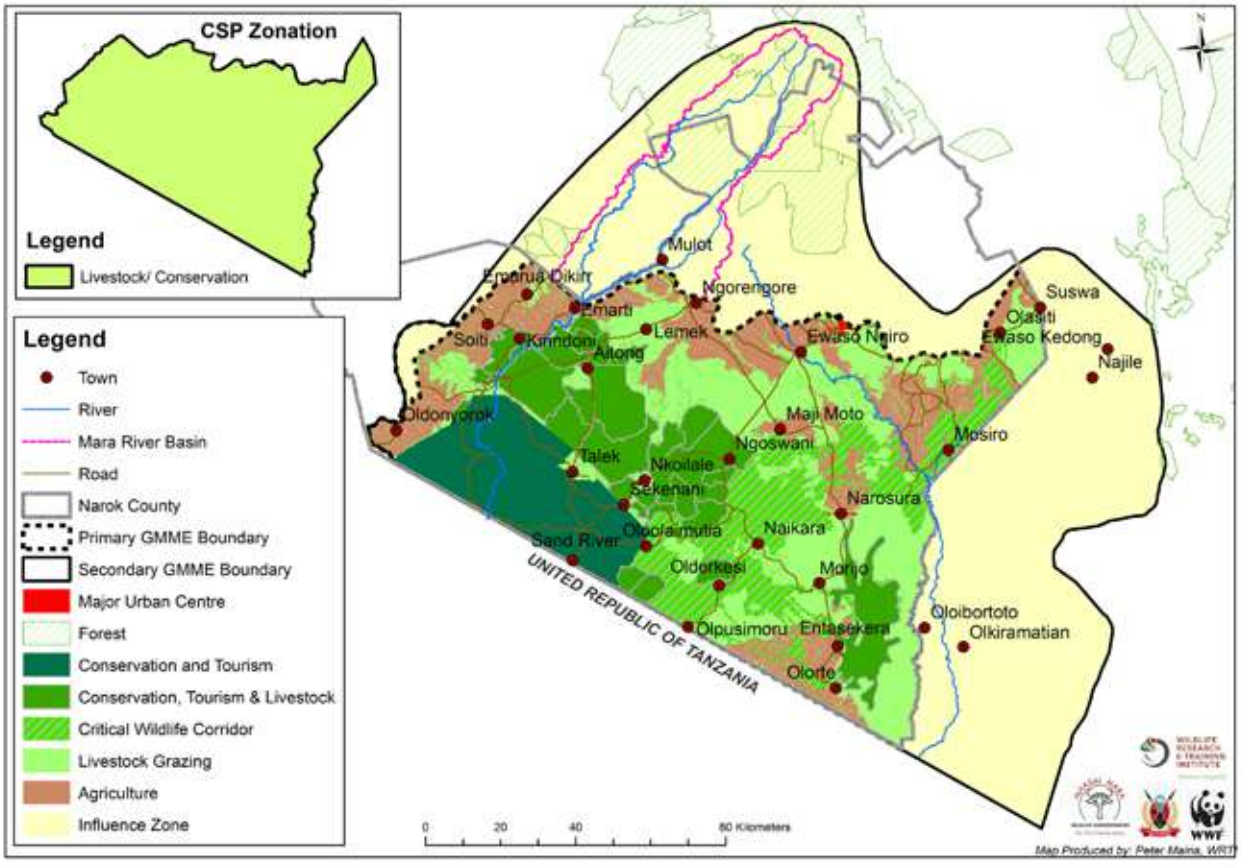

Figure 9. The GMME Land Use Zoning

Zone Purpose, Description and Prescriptions

Conservation and tourism zone

Zone purpose: To conserve wildlife and its habitats, and promote eco-tourism and research.

Zone description: This zone includes the protected Masai Mara National Reserve.

Table 5. Prescriptions for the Conservation and Tourism zone

Allowed uses and activities	Uses and activities not allowed
Conservation • Wildlife conservation • Forest conservation • Research • Rehabilitation through ecological succession • Habitat restoration • Spring protection • Wildlife veterinary interventions (Treatments, desnaring) ***Tourism*** • Tourism-support infrastructure • Development of visitor accommodation facilities in accordance with the PA's management Plan • **All other tourist activities permitted by the MMNR management plan**	***Conservation*** • Unauthorized livestock grazing • Introduction of exotic species • Fishing • Sand harvesting • Unauthorized extraction of genetic materials (live capture) • Settlement • Animal harassment ***Tourism*** **Development of tourist facilities or activities that are not allowed by the MMNR management plan**

Conservation, tourism and livestock grazing zone

Zone purpose: To conserve wildlife and its habitats, promote wildlife tourism, and support controlled human use within the context of a management plan.

Zone description: This zone covers areas set aside for conservation where some compatible human uses are allowed (e.g., low-impact tourism facilities and livestock grazing). These include wildlife conservancies and conservation areas. It is designed to facilitate free movement of wildlife across the landscape.

Table 6. Prescriptions for conservation, tourism and livestock grazing zone

Allowed uses and activities	Uses and activities not allowed
Conservation • Wildlife conservation	**Conservation** • Collection of plant or animal material is not allowed except in

Allowed uses and activities	Uses and activities not allowed
• Habitat rehabilitation and restoration • Scientific research **Tourism** • Tourism-support infrastructure • Development of visitor accommodation facilities and activities in accordance with the conservancy's or conservation area's management Plan **Livestock grazing** • Livestock grazing in accordance with the conservancy's or conservation area's grazing plans **Settlement** • Settlement allowed in designated areas	consultation with the management authorities • Fencing • Planting of exotic tree species • Fishing • Sand Harvesting • Use of Drones • Motorbikes • Sale and subdivision of land **Tourism** • Development of tourism facilities or other infrastructure on marked migratory corridors used by elephants or other large mammal species • Development of tourism facilities within the exclusive area of another facility • Development of a tourist facility that is not within a registered conservancy **Pastoralism** • Livestock grazing in undesignated areas **Settlement** • Settlement in undesignated areas **Cultivation** • Cultivation is not permitted

Livestock grazing zone

***Zone Purpose*:** To promote conservation-compatible land uses such as livestock grazing and thereby reduce human-wildlife conflicts.

Zone description: These are areas bordering wildlife conservancies where pastoralism is the main livelihood for the community. This zone is an important wildlife dispersal area and facilitates seasonal movement of migratory species.

Table 7. Prescriptions for livestock grazing zone

Allowed uses and activities	Uses and activities not allowed
Pastoralism • Livestock grazing in accordance with grazing plans ***Settlement*** • Settlement allowed in designated areas ***Conservation*** • Wildlife conservation • Habitat rehabilitation and restoration • Protection of known wildlife corridors through land leasing and conservation easements • Scientific research	***Pastoralism*** • Livestock grazing in undesignated areas or at density that compete with wildlife • Change of use unless upgrading to a conservancy • Fencing of grazing areas ***Settlement*** • Settlement in undesignated areas ***Conservation*** • Fencing that blocks a wildlife corridor ***Tourism*** • development of a tourist facility that is not within a registered conservancy

Allowed uses and activities	Uses and activities not allowed
Tourism • Cultural tourism • Homestays • Development of tourist accommodation facility allowed if land is first registered as a conservancy	• Development of tourism facilities or other infrastructure on marked migratory corridors used by elephants or other large mammal species ***Cultivation*** • Cultivation is not permitted

Agricultural zone

Zone purpose: To provide areas where multiple land uses, some of which are incompatible with conservation can be practised. Reduction of HWC is a key objective of this zone.

Zone description: Areas where human uses are predominant. These cover areas under human settlement and cultivation.

Table 8. Prescriptions for the agriculture zone

Allowed uses and activities	Uses and activities not allowed
Cultivation • All forms of crop agriculture • Perimeter fencing of the cultivated areas ***Pastoralism*** • Grazing in harvested farms ***Settlement*** • Settlement allowed in designated areas ***Conservation*** • Human-wildlife conflict mitigation measures • Control of soil erosion and water conservation ***Tourism*** • Cultural tourism • Homestays	***Cultivation*** • Cultivation on riparian reserve ***Pastoralism*** • Livestock grazing in cultivated farms (unless after harvest)

Urban centres zone

Zone purpose: To provide areas where nucleated settlement and commercial uses can be promoted.

Zone description: These areas are set aside for urban development and eco-villages.

Table 9. Prescriptions for the urban centres zone

Allowed uses and activities	Uses and activities not allowed
Settlement • Settlement allowed in accordance with urban development plans or conservancy land use plans ***Conservation*** • or at density that compete with land use by wildlife Maintaining green areas for	***Pastoralism*** • Livestock grazing not allowed ***Settlement*** • Unapproved developments ***Tourism*** • Development of a tourist facility that is not

Allowed uses and activities	Uses and activities not allowed
recreation ***Tourism*** • Tourist accommodation facilities allowed in accordance with a land use development plan ***Cultivation*** • Small kitchen gardens allowed	approved ***Cultivation*** • large farms are not allowed

Influence zone

Zone purpose: The purpose of this zone is to promote sustainable use and management of natural resources in the Mara and Ewaso Nyiro catchment areas to ensure adequate water reaches downstream users.

Zone description: This zone comprises the upper water catchment areas of the Mara River and Ewaso Nyiro River. Crop production through rainfed farming is the predominant land use activity in this area.

Zone prescriptions: Although the zone is outside the primary focal area of this plan, GMME stakeholders will influence land use activities in this zone to ensure that the forest and water resources are sustainably managed. No other specific prescriptions are provided for this zone as it is expected that land use in this zone will be controlled through the County Spatial Plan.

NATURAL RESOURCE CONSERVATION AND MANAGEMENT PROGRAMME

Programme Goal and Guiding Principles

Programme goal

The goal of the Natural Resource Conservation and Management Programme is:

To sustainably manage the GMME's natural resources for provision of ecosystem services and other benefits of nature to the local community, the country, and the world in general

Guiding principles

The strategic principles that will guide the implementation of the Natural Resource Conservation and Management Programme are set out below. Wherever appropriate, guidance has been drawn from relevant national and international laws, policies, plans and programmes.

In the implementation of this Natural Resource Conservation and Management Programme, stakeholders will adhere to the following principles:

Protect, restore and rehabilitate degraded species and habitats to maintain ecological services

GMME has an assemblage of wildlife species some of which are threatened according to IUCN classification. Local studies have also documented the population of other species to be declining or stagnating and special management efforts are required to ascertain their actual status. WCMA 2013 calls for the development of monitoring mechanisms and indications to determine sound management of wildlife resources in Kenya and trends affecting Kenya's wildlife conservation and management. This should be backed by a status report of efforts to develop and implement recovery plans for all nationally listed species and the status of all species for which such plans have been developed.

In addition, the GMME also has some pockets of degraded habitats that are crucially linked to the ecosystem and that are known to support important ecological processes like migration. These habitats include forests in Nyekweri and Loita. Habitat loss has also impacted many parts of the rangelands through land use conversion from livestock grazing to cultivation. The Wildlife Act requires publication of ecosystems and habitats that are threatened and in need of protection. The Act further requires that a comprehensive description of the location of such habitats and ecosystems, the specific threats they face, and the measures being taken to restore and maintain their ecological integrity for enhanced wildlife conservation. On the other hand, Principle 5 of the CBD Ecosystem Approach prescribes that *"Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach.* Hence, in view of the above legal requirements, restoring species and their habitats is a guiding principle under

this management programme and management actions will aim to rehabilitate and restore degraded species and their habitats.

Maintain ecological linkages within GMME and with adjacent ecosystems

The GMME has many components, all working in concert to maintain the ecosystem services of the entire ecosystem. The relationship between the Mara Reserve and the conservancies needs to be maintained as it optimizes the conservation value of the ecosystem by creating more space for wildlife, thereby increasing the carrying capacity of the ecosystem.

However, some critical ecosystem components are jurisdictionally outside the primary GMME's zone of influence but their value is crucial. These include the Mau Forest (the source of Mara River), the Serengeti ecosystem to the south, and the Southern Kajiado ecosystem to the east.

Therefore, under this management programme, to mitigate negative impacts that adjacent ecosystems might have on the GMME as well as those that GMME activities might have on adjacent ecosystems, stakeholders will aim to maintain ecological linkages within the GMME and with adjacent ecosystems. This is in line with Principle 3 of the CBD ecosystem approach guidelines which requires "ecosystem managers to consider the effects (actual or potential) of their activities on adjacent and other ecosystems. The Wildlife Act also provides that the government may negotiate and establish trans-boundary or trans-frontier wildlife conservation areas for better management of wildlife resources.

Maintain a balance between conservation and development

The GMME is a leading conservation area, hosting up to 20% of Kenya's wildlife. As a result it is also the leader in tourism activities mainly centred around wildlife safari. For this to be sustainable, the ecosystem needs to generate enough support for human welfare within the limits of sustainable development. This is anchored under Section 4 (e) of the Wildlife Act, which provides that "*benefits of wildlife conservation shall be derived by the land user in order to offset costs and to ensure the value and management of wildlife do not decline*". Further Section 4(f) of the Act states that "*Wildlife conservation and management shall be exercised in accordance with the principles of sustainable utilization to meet the benefits of present and future generations"*. On the other hand, Principle 4 of the CBD ecosystem approach guidelines requires that *"recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context*".

Hence, this management programme will strive to maintain a balance between conservation and development by promoting activities that support conservation, sustainable use, and the fair and equitable sharing of the benefits arising from the utilization of genetic resources as enshrined in the CBD, of which Kenya is a signatory.

Promoting science-driven adaptive management

Management activities in the ecosystem will be developed and implemented following sound scientific principles. The principles require that decisions be made based on available data collected through known scientific procedures. Hence, the importance of peer-reviewed academic studies in guiding management decisions cannot be overemphasized.

The CBD ecosystem approach requires adaptive management to deal with the complex and dynamic nature of ecosystems and the absence of complete knowledge or understanding of

their functioning. Principle 11 of the CBD ecosystem approach guidelines stresses that "*the ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices"*. Hence "*good management depends upon improving the information base and scientific understanding of ecosystem through the promotion, implementation and application of research and integrating this information into decision making*." EMCA 1999 also calls for integration of traditional knowledge for the conservation of biological diversity and mainstream scientific knowledge. In addition, the WCMA, 2013 requires WRTI to "assess information, that is the basis of ecosystem-based management plans for all wildlife conservation areas". Consequently, in line with the CBD, EMCA, 1999 and WCMA, 2013, this management programme will apply scientific information and traditional knowledge to inform management decisions.

These strategic principles are intended to guide the implementation of the Programme's four management objectives that, when taken together, achieve the Programme Purpose. These four objectives are:

MO 1. Rangeland resources are sustainably managed to support healthy wildlife and livestock populations
MO 2. Forest resources are conserved and managed in collaboration with stakeholders
MO 3. Sustainable water resource management is promoted yielding clean and adequate water for all water users
MO 4. Wildlife conservation and management enhanced resulting in stable or increasing wildlife populations

The following sections describe these management objectives and the corresponding management actions needed to achieve them. Under each management objective and action, a rationale and a description of how the objective or action will be achieved is provided.

Management Objectives and Actions

Objective 1: Rangeland resources are sustainably managed to support healthy wildlife and livestock populations

Rangeland resources are the foundation of the economic importance of the ecosystem and their successful management will mean continued benefits to local, national and international stakeholders. The future desired state for the GMME is therefore where rangeland resources are sustainably managed to provide diverse ecosystem services.

The ecosystem has experienced many challenges with respect to rangeland management. Fencing private land outside the national reserve has led to habitat fragmentation and reduced movement for wildlife and livestock. Habitat fragmentation leads to a decline in the range carrying capacity, a major factor behind the declining wildlife populations in the ecosystem. Fragmentation and fencing also obstruct connectivity which kills vital ecological

processes that are key to sustainable wildlife conservation. In addition, habitat loss caused by expansion of dryland agriculture, climate change (variability of rainfall and increase in temperatures), changes in land use, human population growth, and unplanned settlement are other factors blamed for the observed overall decline in wildlife numbers.

The recent reports[40] indicate worrying trends in populations of large herbivores species in Narok County and the Mara Ecosystem in particular. All wildlife species populations in Narok county have been strongly declining during the last 40 years except elephants and ostriches. Most species have now 60-90% lower populations than around 1980.

This objective seeks to address these challenges by working with conservancies and communities to improve the productivity of the GMME rangelands. This will require innovative policies and programmes that will see communities derive tangible benefits from conservation.

The management actions that have been designed to achieve this objective are elaborated in the following sections:

Action 1.1: Identify and map critical wildlife corridors and dispersal areas

In recognition of the important role of wildlife to the people and economic development, Kenya's Vision 2030 emphasizes wildlife conservation through the protection of critical habitats, corridors, and the dispersal areas on which they depend[41,42].

Wildlife migratory corridors connect core habitats and are critical for species' survival and the long-term viability of ecosystems. Animals disperse or migrate across landscapes to access vital resources, such as pasture, water, and breeding grounds; to reduce the risks of predation; and to enhance genetic health. Migration is essential to the resilience of wildlife populations in the face of spatial and temporally variable rainfall, forage, and climate change.

Wildlife corridors are critical to wildlife conservation and survival especially for the key species in the GMME like elephants, lions, wild dogs, hyenas and wildebeests. However, habitat transformation by the rapid expansion of human activities, such as fencing[43], crop cultivation, forest clearing, new urban centres and expansion of existing ones, and high-density settlements are choking these corridors. To understand the status of wildlife corridors in the GMME a study carried out in 2016 identified 17 critical corridors that need to be secured to maintain ecological connectivity in the GMME (Figure 10)[44]. Another detailed corridor study was done in 2019, and it mainly focused on corridors cutting across the Narok-Sekenani road. This study identified 8 corridors that are increasingly being degraded and recommended remedial measures[45]. Therefore, to understand the status and effectiveness of corridors in the GMME, this management action seeks to update the status of the wildlife

[40] Ogutu, J. O., Kifugo, S.C., Senteu, J. S., Obath, C., Amoke, I., and Olff, H. (2021). Reversing the disintegration of the Mara Ecosystem: A feasibility study.

[41] Ojwang', G.O., Wargute, P.W., Said, M.Y., Worden, J.S., Davidson, Z., Muruthi, P., Kanga, E., Ihwagi, F., and Okita-Ouma, B. (2017). Wildlife Migratory Corridors and Dispersal Areas: Kenya Rangelands and Coastal Terrestrial Ecosystems.

[42] GoK (2017). Kenya Vision 2030. The Popular Version.

[43] Løvschal, M., Bøcher, P., Pilgaard, J., Amoke, I., Oluoko-Odingo, A., Thuo, A., Svenning, Jens-C. (2017). Fencing bodes a rapid collapse of the unique Greater Mara ecosystem. Scientific Reports. 7. 1-7. 10.1038/srep41450.

[44] Poole, J., B. Okita-Ouma, P. Granli, D. Kimanzi, M. Goss, L. Tiller, S. Kiambi, and I. Douglas-Hamilton. (2016). Mara ecosystem connectivity: Information on elephant population status and movements for spatial planning and conservation in Narok County. Pages 1-28.

[45] Mwiu, S., J. Edebe, S. Akoto, G, Waiguchu, V, Nyaga and J. Wall (2019). Status and viability of Wildlife Corridors in Masai Mara Ecosystem: Initiative for Conservation of Mara-Serengeti Transboundary Ecosystem Project. Narok : Mara Research Station, Kenya Wildlife Service.

corridors building on previous corridor studies. Detailed mapping of threats and land owners on each corridor will be conducted and a strategy to secure the corridors developed. The strategy will include a wide range of intervention measures, such as conservation easements, land leases, establishment of conservancies, and compensation for removal of fences, among others.

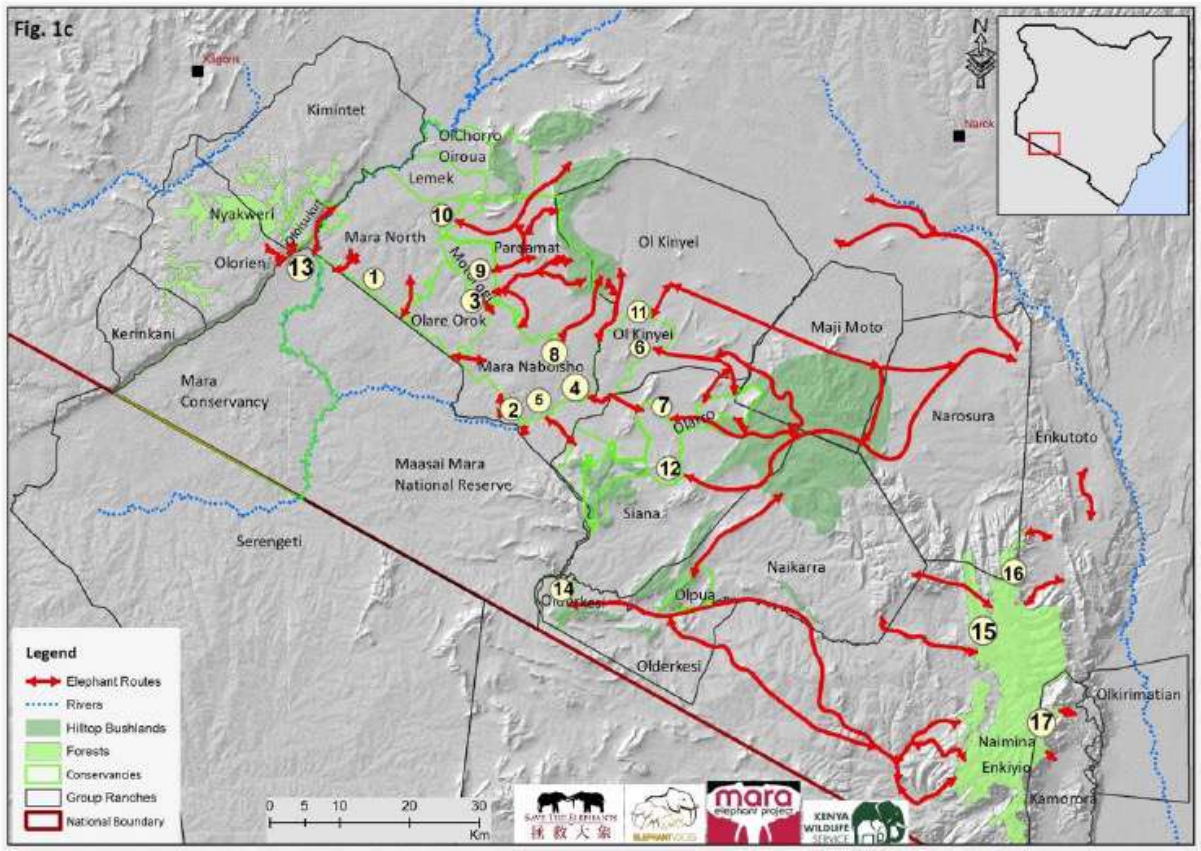

Figure 10. Priority elephant routes in the GMME

Action 1.2: Secure wildlife corridors and dispersal areas

To stem the declining trends in wildlife habitat and improve ecosystem connectivity, MMWCA has been supporting the local community in the Conservancy establishment process. So far, 17 conservancies are functional and several others are going through the conservancy formation process. MMWCA has been working with partners to identify, map wildlife corridors, and engage land owners to secure the corridors through conservancy establishment. A recent feasibility study on '*Reversing the disintegration of the Mara Ecosystem'* proposed six scenarios, which if implemented, will restore the wet season wildlife migration areas that are currently seriously degraded[46]. These scenarios include the establishment of new conservancies or corridors or a combination of conservancies and corridors. Three new conservancies are proposed in the previous primary wet season calving area of wildebeest in the Loita Plains, a conservancy is proposed at Nyekweri Forest, and another one at Olderkesi.

[46] Ogutu, J. O., Kifugo, S.C., Senteu, J. S., Obath, C., Amoke, I., and Olff, H. (2021). Reversing the disintegration of the Mara Ecosystem: A feasibility study

Hence, to secure and restore wildlife migration areas, MMWCA will work with other stakeholders to prioritize the establishment of the identified conservancies and corridors. This will involve:

- leading the process of soliciting for funds to secure identified corridors and development of lease agreements;
- supporting the registration of appropriate conservancy governance instruments; supporting the implementation of a legal body to sign and register leases;
- ensuring the development of a functioning revenue model tailored to the available revenue sources of each conservancy; and
- partnering with local wildlife organizations to monitor the effect of new conservancies on wildlife populations.

Table 10 summarizes the priority proposed conservancies and corridors, while Figure 11 illustrates them[47].

Table 10. Priority conservancies and corridors

Scenarios	Area(Km^2)	Description and status	Recommendations
Scenario 1- conservancy	406	• primary wet season calving area of wildebeest • connects from the current Mara Isinya conservancy • almost completely fenced and used for livestock ranching, while having hardly any cropland	• Remove all fences • Establish a corridor that connects the current Naboisho conservancy to the Loita Plains.
Scenario 2(same as Scenario 1) Conservancy in the Primary wildebeest calving area	As above	• Connected to Ol Kinyei conservancy through a different corridor of 354 km² • Corridor overlaps with the Muntoroben community • Conservancy • Corridor currently almost fully fenced	• Remove all fences in the corridor
Scenario 3-Conservancy between Maji Moto and Ewaso Ngiro	515	• now almost completely fenced.	• Remove fences • Establish a corridor linking it to Ol Kinyei
Scenario 4(Expansion of Scenario 3 but stretches towards Narosura)	823	• not yet subdivided, the fencing is just starting in this area. • Can only be connected to the dry season range through the realization of the previous scenario 3.	• Prioritize this corridor
Scenario 5-conservancy at Nyekweri Forest	523	• active Elephant hotspot and crucial water tower • under threat from	• Control charcoal burning

[47] Ogutu, J. O., Kifugo, S.C., Senteu, J. S., Obath, C., Amoke, I., and Olff, H. (2021) Reversing the disintegration of the Mara Ecosystem: A feasibility study

Scenarios	Area(Km^2)	Description and status	Recommendations
		subdivision and thus fencing • increased deforestation for charcoal production	
Scenario 6- Conservancy at Olderkesi	197	• an important elephant route from MMNR to the Loita Forest • fencing is minimal • existing proposal to extend Olderkesi	• Remove fences

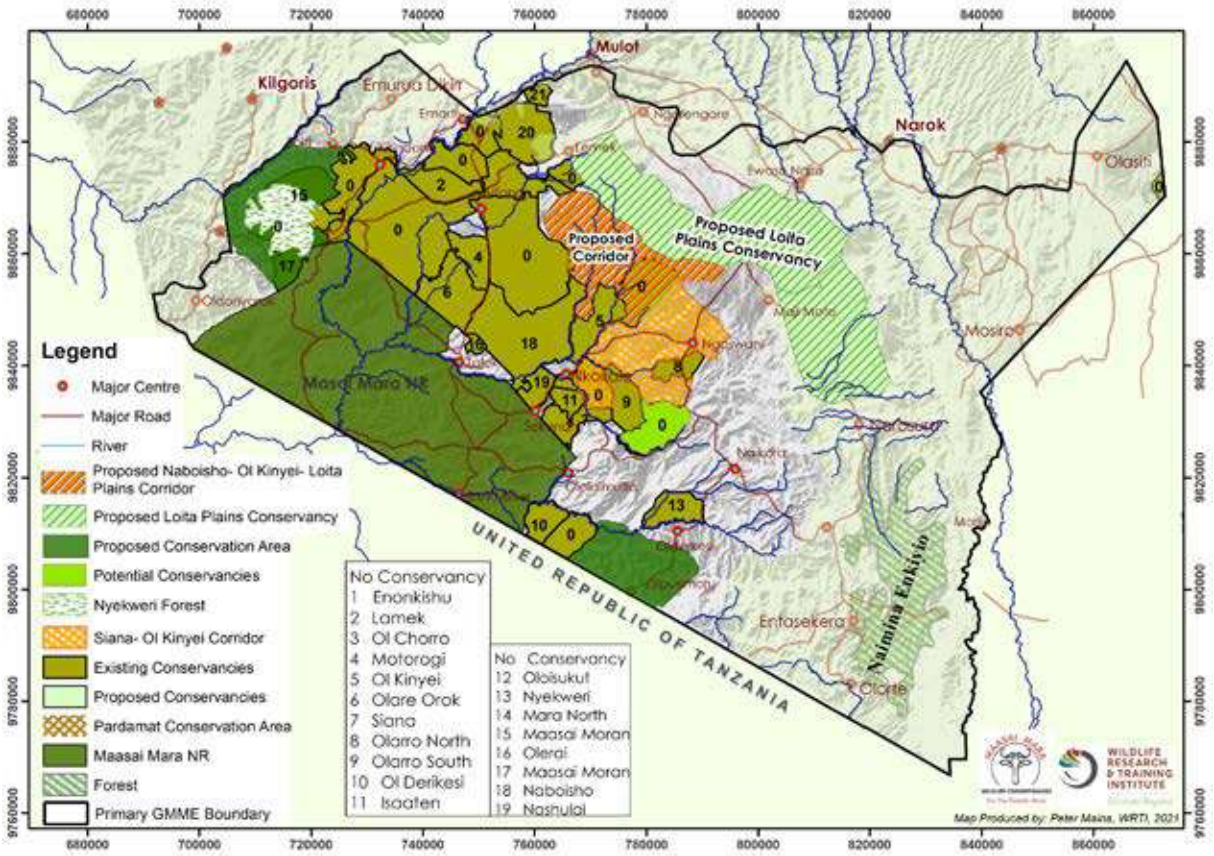

Figure 11. Priority corridors, conservancies and conservation areas

Action 1.3: Support removal of fences to increase space for wildlife and habitat connectivity

The GMME is getting highly fragmented because of land sub-division and fencing of private land parcels. This decreases movement range for wildlife, especially during the dry season, compressing wildlife within smaller enclaves with diminished pasture and ecological space. There have been many reports of wildlife trapped on the fences an aspect that increases the mortality of species like wildebeests, zebra and giraffes.

To curb fencing and by so doing avert habitat fragmentation, there is a need to win community support in carrying out a de-fencing programme in critical corridors and dispersal areas. The target should be to have all conservancies interconnected among themselves and the reserve plus all vital corridors open for wildlife movement needs. To achieve this, a clear

proposal and program on how to compensate landowners who de-fence their land to allow wildlife movement will be developed. This will be accomplished through leasing land or other forms of compensation acceptable to all parties, such as conservation easement.

Concern has also been raised over the use of cedar trees in fencing which causes the destruction of important cover in the catchment forests. Hence, to further minimize impacts of fencing, alternative non-wood fencing materials (e.g. plastic poles) will be promoted in areas practicing crop production. In addition, the fencing status map in the ecosystem will be continuously updated.

Action 1.4: Control overgrazing in the GMME

The most widespread management issue in the GMME rangelands is overgrazing by livestock (Figure 18). Wild herbivores rarely over-graze because they frequently move to avoid predators and areas fouled by dung and urine[48]. Overgrazing leads to a decline in loss of soil cover, making the land vulnerable to soil erosion. It decreases desirable forage species and encourages infestation of invasive species that do well in degraded rangelands, such as Sodom Apple, *Solanum incanum.* Such degradation reduces the area's carrying capacity for large mammals and subsequent wildlife species loss.

Therefore, to ensure that overgrazing in the rangelands is controlled, sound and effective grazing management based on appropriate stocking levels, is essential. In view of this, the CGN, in collaboration with partners and land owners, will establish a sound mechanism for land management to address the overgrazing issue in the ecosystem. This will include participatory assessment of the conservancies and the areas outside conservancies to determine and recommend the appropriate livestock stocking rates. This assessment will also consider the grazing requirements of wildlife herbivores co-existing with livestock. Once the stocking rates for different management units (individual conservancies and conservation areas) are determined, the grazing committees that regulate livestock grazing in the different management units will be required to allow livestock grazing based on the recommended stocking rates and the management unit's grazing plan.

To ensure that degraded areas are restored, each management unit will identify and restore such areas by closing the degraded areas from livestock and allowing the areas to recover naturally. However, if the area is severely degraded, habitat restoration measures, such as grass reseeding and covering the reseeded bare areas with branches to minimize grazing pressure, and gulley healing measures such as filling the gulley with dead branches, will be implemented.

Action 1.5: Control urban development

There is an increasing emergence of unplanned settlements within the ecosystem that is contributing to rangeland fragmentation and blockage of wildlife migration routes. These peri-urban settlements are catalysed by increasing human population and associated developments. For instance, there has been emergence of urban centres along main roads[49]. Investment opportunities within the landscape have increased attracting non-locals (both Kenyans and international). This has resulted from the availability of alternative land uses necessitating the centralization of certain services. As a result, 'ripple effect' developments have emerged, such as schools, health centres, police posts/stations, market centres and other social amenities. All these factors acting individually or combined, coupled with the lack

[48] Bubb, P., Soesbergen, A.V., Bisht, N., Singh, G., Joshi, S., Aryal, K., Danks, F.S., Rawat, G.S., Bhuchar, S., Wu, N., Kotru, R., Yi, S. (2017) Planning management for ecosystem services – An operations manual. ICIMOD Manual 2017/5. Kathmandu: ICIMOD

[49] Mara Conservancies CNR-CAP, 2015

of an existing spatial plan, have led to an explosion of these unplanned developments posing a conservation challenge. Therefore, to control impacts of these urban centres on the environment, and wildlife, CGN will prepare land use development plans for these centres in accordance with the Physical Planning Act, 2019. These plans will consider securing wildlife movement and maintaining, as much as possible, green spaces in the centres. And to control pollution from solid waste, an environmentally friendly waste disposal system will be designed for each urban centre.

Action 1.6: Control invasive species

Invasive species are a key threat to the productivity of the GMME rangelands and to the survival of indigenous species that co-occur with them. Invasive species can either be exotic or indigenous, whereby indigenous species can turn invasive, replacing other species and dominating the community floristic composition of an area. There is an urgent need to control invasive species as they negatively affect habitat quality and integrity and diminishes forage production. To address this problem, the first task will be to map out areas colonized by invasive species in the ecosystem and then design and implement an invasive species control programme. The key features of this programme will include developing an ecosystem-wide standard operating procedure for controlling and managing invasive species, identifying and mapping the distribution of invasive species through research expeditions, and continuous manual removal or biological control of these species.

Action 1.7: Develop an ecosystem-wide fire management strategy

Fire is an important component of a rangeland ecosystem. Prescribed fire can be used positively as a management tool for rangelands. It is used as a disturbance where grasses and bushes are very tall and fibrous at a state where they are unpalatable by wildlife and livestock. It can be used to fasten the nutrient cycling and induce fresh and nutritious foliage. Such a prescribed fire programme is well established in the Serengeti side of the ecosystem and there is a need to study its cycle of implementation. On the other hand, wildfires, which are common in the GMME, can cause serious damage to the natural ecosystem and human investments.

To maintain the rangelands in a healthy condition, an ecosystem-wide fire management strategy will be developed and implemented. This strategy will cover both how to use and manage prescribed fire as a tool for rangeland management, and how to control wild fires. Fire control measures will include constructing fire breaks in fire prone areas, establishing a rapid-fire response team and acquiring necessary tools and equipment for fire management.

Action 1.8: Support Conservancies to widen income opportunities

Conservancies have continued to play an important role on conservation, tourism and community livelihood support. To continue serving their conservation value as extra space for wildlife, they need to become viable enterprises that earn tangible income to the people who give their land for conservation.

Besides the development of conventional programmes like tourism and livestock, there is a need to identify other sources of revenue to increase income due to the communities. Such potential sources of income include carbon credit which has been exploited successfully in some parts of the country like the Chyulu Hills. There is also a need to advocate for the gazettement of consumptive wildlife utilization guidelines so that conservancies can legally explore commercial opportunities in wildlife products. Under this management action, the following will be carried out: studies on the potential of GMME as a carbon sink; bench marking with successful carbon credit schemes in Taita Taveta Conservation Area; and survey of alternative income opportunities for conservancies other than tourism.

Action 1.9: Support establishment of wildlife conservancies

There is a need for the establishment of more conservancies in the rangelands to increase space for wildlife (see Action 1.1 of the Community Livelihood Programme). To achieve this, land owners wishing to establish conservancies will be assisted in carrying out social and ecological assessments to determine the feasibility of the conservancies. Once it is established that the conservancy is viable, land owners will be assisted in the development of its management plan and registration with KWS. Stakeholders will also build the capacity of the new conservancies in management and enterprise programmes to fasten sustainability of the conservancies.

One major challenge is making conservancies a competitive land use so that landowners are not lured by more income to other land uses like agriculture that are not compatible with conservation. To this end, there is a need for successful enterprises that bring income to the landowners and make conservancies win support. The stakeholders will, therefore, support community livelihood activities, mainly livestock production, through a well-thought-out grazing and commercialization programme.

Action 1.10: Conduct strategic environmental assessment (SEA) on potential impacts of proposed infrastructure projects on wildlife and livestock keeping

Several infrastructural projects have been implemented in the ecosystem and others are underway. These include national government road and airport projects; urban development projects being implemented by the County Government; and small projects (e.g. fencing, tourist facilities) that individuals are implementing. All these projects will have either positive or negative impacts on the GMME. This, therefore, calls for a Strategic Environmental Assessment to analyze environmental problems and opportunities for all proposed developments in the GMME. This SEA will be carried out in accordance with the EMCA, 1999 and the National Environment Management Authority's SEA guidelines.

Action 1.11: Control charcoal production

In the GMME, charcoal production is one of the direct drivers of ecosystem change that negatively impacts the forests and the rangelands. This activity is driven by the high demand for charcoal in urban areas inside and outside of the GMME. To address this problem and thereby contribute to climate change mitigation, the use of alternative sources of energy will be promoted in the urban centres within the ecosystem. In addition, sustainable charcoal production and energy projects will be implemented in the charcoal production hotspots, such as Nyekweri and Lemek, to showcase efficient charcoal production technologies and promote their adoption. Stakeholders will also work with the Kenya Forest Service and the local administration to enforce the Charcoal Rules. And to minimise charcoal production, an outreach programme involving promotion of energy saving cooking jikos will be implemented in the urban and rural areas of the GMME.

Action 1.12: Control tourism impacts

The main concerns regarding tourism effects in the ecosystem include:

- Disturbance of important ecological sites like migration crossings and breeding sites
- Off-road driving in the national reserve
- Pollution of Mara and other rivers through poor waste disposal
- Wildlife disturbance

To minimize off road driving in the reserve will require enforcement of MMNR rules and regulations. Similarly, minimizing river pollution by tourist facilities will require enforcement of

the EMCA, 1999 which requires that such facilities conduct annual environmental audits. Therefore, MMNR management will work with relevant stakeholders to enforce rules on off-road driving and pollution of rivers. A responsible tourism charter for the ecosystem will also be developed and shared with all ecosystem stakeholders.

Action 1.13: Control sand harvesting

As noted elsewhere in this plan, mining is an important economic activity in the GMME. Sand harvesting occurs along the valleys of both permanent and seasonal rivers. However, sand harvesting has negative environmental impacts as it destroys riverine vegetation, increases river bank erosion and interferes with aquatic biodiversity. Nevertheless, if well controlled, negative impacts of this activity can be mitigated. Hence, under this management action, GMME stakeholders will advocate for the development and enforcement of environmentally friendly county bylaws to regulate sand harvesting within the ecosystem. All the areas where sand harvesting is taking place will also be mapped and environmental and ecological risks posed by sand harvesting assessed.

Objective 2: Forest resources are conserved and managed in collaboration with stakeholders

The future desired state of GMME is where natural forests are sustainably managed to fulfill the social, economic, ecological, cultural and spiritual needs of the present and future generations. Currently, the GMME natural forests (Loita, Nyekweri, and Mara Riverine forests) face threats from: tree cutting to pave the way for crop farming and settlement, charcoal burning, poorly controlled livestock grazing, human-caused wildfires, and logging for building and fencing materials. Mau forest which is a major catchment for Mara River, the lifeline of Mara wildlife, faces similar threats. The magnitude of these threats has increased over the years as demand for land to cultivate or settle, and forest products increase with human population growth. Increasing land tenure changes from communal land (group ranches) to private land and unclear forest boundaries have also contributed to increase in forest decline. For instance, only a small part of the original Nyekweri Forest, in the former Olorien Group Ranch, now remains (Figure 12). The scenario is the same in Loita forest, although not as dire, as forest grasslands have been converted into individual farms diminishing the forest's livestock grazing capacity. Continuous livestock grazing in the forests is likely to significantly alter the vegetation structure and composition due to reduced tree seedling establishment. In addition, poorly regulated harvesting of forest products, such as building materials, fodder and medicinal herbs, could result in overharvesting of preferred species as has happened in Loita Forest where Cedar *Juniperus procera* and African Olive *Olea africana* have been overexploited.

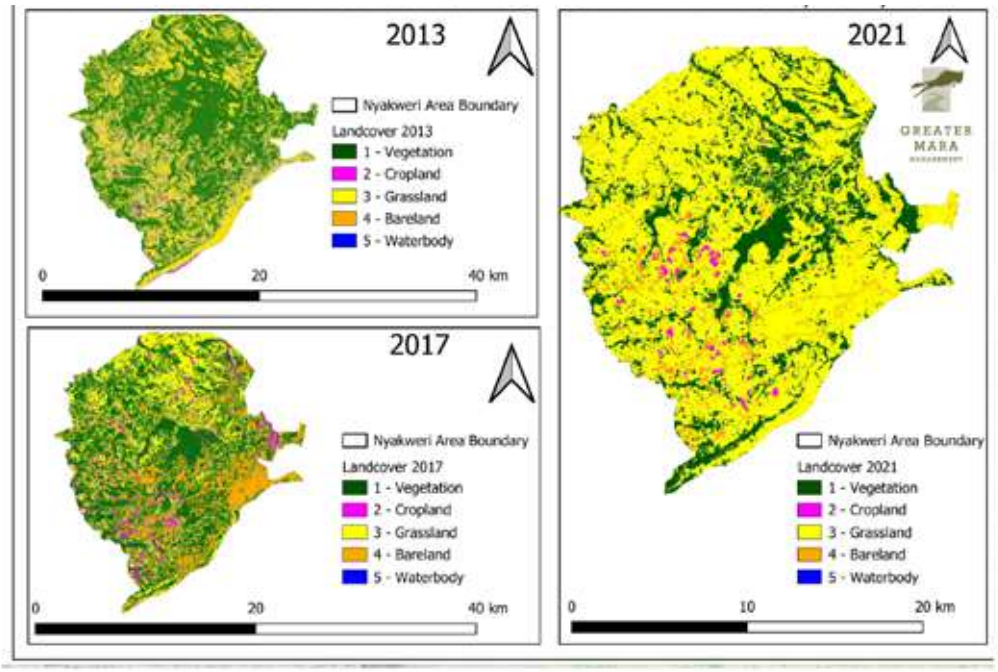

Figure 12. Land cover change in Nyekweri Forest 2013-2021[50]

This management objective has, therefore, been designed to address threats to forests within the GMME (Loita, Nyekweri, and Mara Riverine Forest) and its influence zone (Mau Forest).

The management actions that will be implemented to achieve this objective are elaborated in the following sections.

Action 2.1: Survey and mark forest boundaries

One of the challenges to the integrity of the GMME forests is unclear forest boundaries that leads to forest encroachment by settlement and cultivation. In the community-managed Loita Forest, the community has reduced the forest through gradual encroachment by settlements and farms. The majority of Nyekweri Forest has already been cleared and converted to cultivation and settlement, and only a small section of this forest is still intact.

To address the threats to these forests, stakeholders will work with the relevant government authorities to ensure that the forest boundaries are surveyed and clearly marked. In the case of Loita Forest, which is in two land adjudication sections, the community has agreed on the area to be set aside as a community forest and the area to be subdivided and allocated to community members. The agreed boundary of this forest will be surveyed and marked to prevent further encroachment which is blamed on ambiguous boundaries. The boundary of Nyekweri Conservancy will also be determined and marked based on the land parcels joining the conservancy.

Action 2.2: Support establishment of wildlife conservancies at Loita and Nyekweri forests

Loita and Nyekweri forests are biodiversity hotspots in the GMME. They host diverse wildlife and plant species, and both forests are important elephant breeding areas. They are valued for the provision of livestock grazing area, building materials, cultural and spiritual sites, traditional herbal medicines, edible fruits and seeds, and honey. However, despite these

[50] Source: Kenya Wildlife Trust

values, the forests have been shrinking due to encroachment fueled by land tenure changes and population growth. To ensure continued provision of current ecosystem services and exploit the forests' immense potential for low impact nature-based tourism and payment for environmental services, the Loita and Nyekweri Communities will be supported in establishing wildlife conservancies. This will involve mobilizing the community to support the establishment of the conservancies; conservancy registration; leasing land parcels (in the case of Nyekweri Forest); and looking for tourism investors.

Further, the County Government of Narok will formulate policies to safeguard forests from deforestation and promote tree planting initiatives within the ecosystem. It will also, strengthen law enforcement measures to curb illegal logging and charcoal burning within the ecosystem to protect the existing forest cover.

Action 2.3: Support development of management plans to regulate forest use and access

A key output of the ongoing land adjudication process in the Loita Forest is a clear demarcation of the forest boundary. It is also envisaged that the Forest will continue to be managed by the traditional Oloibon institution that has managed the forest for many generations. The Oloibon institution works through an Environment Committee that coordinates forest access and use through community forest rules, zonation and rotational use. However, this management system is not documented but instead it is passed down from generation to generation and sustained through traditional support system of taboos, practices, and social obligations. Lack of formal documentation of the management system is resulting in poorly coordinated land uses in Loita Forest. Similarly, Nyekweri Forest Conservancy is in its formative stage and once registered, it will require a management plan.

Therefore, to ensure that land uses in the two forests are managed to achieve sustainable provision of ecosystem services, the Loita and Nyekweri communities will be supported to develop and implement management plans for the two forests. The management plans will seek to regulate land use in the forests and streamline protocols for community access to forest resources. The plans will zone the forests according to allowable land uses including protection, eco-tourism, livestock grazing, bee keeping, grass harvesting, fire wood collection, and harvesting building materials. In addition, they will contain bylaws that will be used to regulate forest resource use to ensure sustainable conservation and management of the forests. As part of the management planning process, a Natural Resource Assessment will be conducted to ascertain the availability and extent of natural resources and the rate and pattern of their depletion and degradation to support the design of effective intervention measures. This assessment will be done in collaboration with research institutions, such as Kenya Forestry Research Institute (KEFRI) and WRTI.

Action 2.4: Support the Oloibon traditional institution in the management of Loita Forest

Loita forest is Community Land under the stewardship of the Oloibon traditional governance mechanism, which makes and implements forest resource use rules. The forest management governance is done with the aid of the village environment committee that enforces forest rules. The Environment Committee comprises of elders who make management decisions and youth (Morans) who patrol the forest. To enhance the capacity of the Environment Committee, the Oloibon has coopted governmental agencies and NGOs in the area to the Environment Committee.

To strengthen the Oloibon's forest management capacity, the Oloibon will enter into formal agreements with relevant stakeholders to enhance the delivery of various management components. Hence, to improve forest protection and enforcement of forest rules, the

Oloibon will work with KWS and other government security agencies in patrolling the forest and law enforcement. This will require the Oloibon and KWS to sign an agreement on the coordination of wildlife security in the forest. Furthermore, to ensure the Oloibon has the requisite capacity to manage the forest effectively, the elders and youth from the Oloibon institution will be trained in forest management practices, assisted in establishing security outposts, provided with patrol tools and equipment, assisted in recruiting community rangers, and in developing Payment of Environmental Services (PES) projects.

Action 2.5: Conduct a study on forest resource supply and demand

Although harvesting of forest products is going on in Loita Forest, information on the community's needs and the level of available forest resources is scanty. Therefore, to bridge this gap, a study will be conducted to determine the growth, yield and extraction levels of wood and non-wood products in Loita Forest. The outcomes from this study will then be used by the Loita Forest Environment Committee to design appropriate extraction levels for wood and non-wood products from different forest sections. Moreover, the study's outcome will be used to develop guidelines for various allowable forest uses including livestock grazing, honey harvesting, grass harvesting, and collection of medicinal herbs.

On the other hand, poorly controlled livestock grazing has been identified as one of the threats to forest management at Loita Forest. Whereas the forest is expected to be accessed by livestock during drought, it is not uncommon to see livestock in the forest during the wet season. Continuous livestock grazing in the forest leads to forest grazing pastures hosting livestock beyond the carrying capacity leading to overgrazing and subsequent degradation of pastures through soil erosion. To regulate and control livestock grazing in each forest section, it is vital that the livestock carrying capacity of each zone is established. Towards this then, a study will be conducted to determine the livestock carrying capacities of each forest management section.

Action 2.6: Support on-farm tree planting in forest-adjacent areas

The demand for forest resources, such as building materials and fuel wood, has increased with human population growth. To reduce pressure on the forests and at the same time capitalize on the local and regional demand for wood products, on farm tree planting will be promoted in the forest-adjacent areas. This is in line with the Agricultural policy that requires that 10% of a land parcel is dedicated to tree farming. However, the farm forestry sector faces many challenges including the lack of skills among farmers to produce trees for commercial purposes. Therefore, a farm forestry extension programme will be initiated in the forest adjacent areas to ensure that farmers have the requisite silvicultural skills to grow trees. In this regard, on-farm tree planting demonstration plots will be established and used as focal points for technology dissemination at the farm level.

For on farm tree planting to succeed there is a need to provide affordable tree seedlings to farmers. Thus, to meet the tree seedling demand, the community will be supported in establishing tree nurseries to produce, for sale, suitable community-preferred tree species adapted to Mau, Loita and Nyekweri forest areas.

Action 2.7: Rehabilitate water catchments areas

One of the key interventions to address the reduced water flow in GMME rivers during the dry season is to rehabilitate water catchment areas. The water catchment areas, especially for the Mara River, have been destroyed through illegal settlement, logging for timber and charcoal as well as agriculture, leading to reduced flow in the Mara River and no flow in some of the rivers and streams that feed it, especially during the dry season.

Hence, to address the problem of degradation of the water catchment area (Figure 13), stakeholders will work with communities living in the water catchment areas to rehabilitate the Mau Forest. The forest rehabilitation projects will be implemented through Mau Forest Community Forest Associations (CFAs) that collaborate with KFS in participatory forest management. These projects will include tree planting in forest degraded areas, promoting on-farm forestry, and promoting sustainable agriculture to minimise soil erosion, and soil and water pollution. Further, the CFAs capacity to secure the forest will be enhanced through support of operations to deter tree poaching.

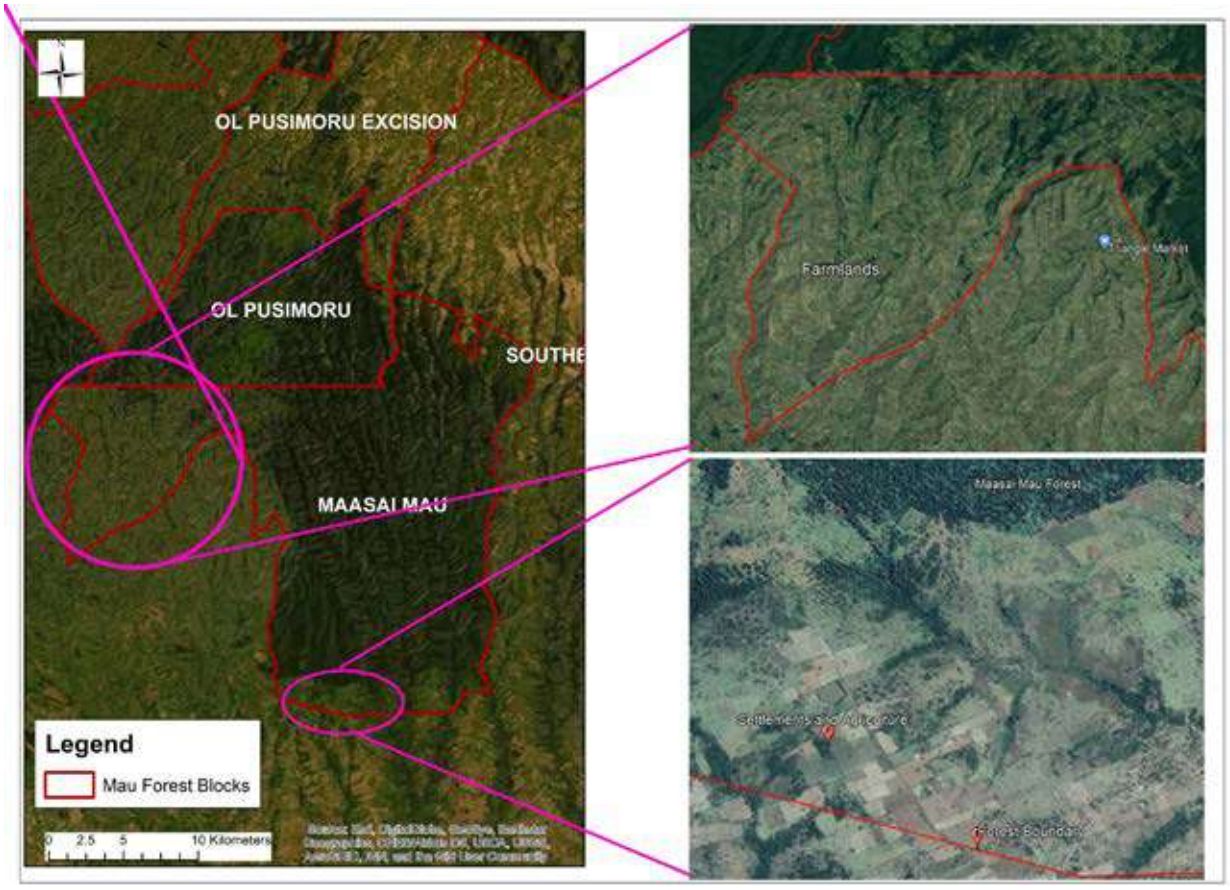

Figure 13. Land degradation in the Mau complex

Objective 3: Sustainable water resource management is promoted yielding clean and adequate water for all water users and needs

The future desired state at the GMME is where water resources are managed and equitably shared among different water users. The main water uses in the ecosystem are domestic use, livestock, and irrigation. The main water sources are surface water (rivers, streams and springs) and ground water (boreholes). Most of the surface water is within the Mara River Basin which comprises of the Mara River and its tributaries. However, the Mara River faces many challenges stemming from catchment degradation caused by deforestation resulting in low water quality and quantity due to water pollution and siltation. The banks of Mara River's tributaries (Amala and Nyagores) in the upland areas and springs have been encroached. In addition, excessive water abstraction leads to low water levels downstream of the Mara River.

This objective is designed to ensure sustainable management of the water resources and to maintain natural water flow regime in the GMME. The management actions that have been designed to achieve this objective focus on the development of sub-catchment management plans; development of sub-catchment water allocation plans; collaborating with Water Resource Users Associations (WRUAs) to enforce water regulations; supporting irrigation farmers to harvest run-off or flood water for irrigation; controlling farmland nutrient, sediment and pollution discharge into water bodies; building the capacity of WRUAs to effectively participate in water resource management; and collaborating with Water Resource Authority (WRA) in monitoring water abstraction, river water levels and water quality. These actions are expanded in the following sections.

Action 3.1: Support development, implementation and revision of Sub-Catchment Management Plans (SCMPs)

There are 19 sub-catchments in the Mara River Basin that are managed by WRUAs. As of 2018 seventeen of these sub-catchments had developed Sub-Catchment Management Plans (SCMP) that provide WRUAs and WRA a framework for collaborative management of water resources and water conflict resolutions. To enhance water resource management in the GMME, stakeholders will collaborate with WRA to support all WRUAs to develop or revise their SCMPs to incorporate effective climate change adaptation strategies for livelihood needs and climate risks. WRUA's will also be given technical assistance to prepare funding proposals to enable them solicit for funding from partners to support the implementation of the SCMPs.

In addition, the County Government of Narok will formulate a framework to protect and nurture the County's water catchment areas and wetlands.

Action 3.2: Work with Water Resource Users Associations (WRUAs) in protecting and rehabilitating riparian areas

Riparian forests serve critical roles in stabilizing river banks, slowing down runoff during large rainfall events, and reducing soil erosion. They are also biodiversity hotspots and have recreational value as they support tourist activities, such as camping, picnicking and nature walks. However, despite their recognized values, there has been extensive loss of riverine forests to subsistence and large-scale farming in the catchment areas. Some sections of the upper Mara River Basin, particularly along the Amala and Nyangores tributaries of Mara River, have also been encroached despite laws protecting riparian land. This could be attributed to inadequate human and financial resource capacity in the institutions responsible for water resources management, such as WRA and WRUAs and NEMA, to effectively enforce the relevant environmental laws.

Hence, to sustainably manage the riparian land along Mara River, the legally protected riparian reserve will be marked starting with areas that have been encroached[51]. The biodiversity status of the riparian land will then be assessed and mapped using current remote sensing data to determine riparian areas that have been encroached and those that have been degraded. This information will then be used to design and implement a WRUA-led riparian land rehabilitation programme. This programme will include allowing natural regeneration where desirable, and active replanting in severely degraded areas. Mara stakeholders will also work with WRA, NEMA and WRUAs to enforce relevant environmental

[51] The Water Resources Management Rules, 2007: 116 (2) "the riparian land on each side of a watercourse shall be defined as a minimum of six metres or equal to the full width of the watercourse up to a maximum of thirty metres on either side of the bank".

laws (Water Act, 2016 and EMCA, 1999). In respect to this, stakeholders will assist WRUAs in patrolling the riparian land to detect and deter illegal activities, such as tree cutting, charcoal burning, cultivation, and non-adherence to water allocation plans. In addition, to gain support of the land owners abutting the riparian land, these land owners will be sensitized on the values of the riparian land, including stabilizing the river bank, reducing soil erosion, and providing wildlife habitat and recreation sites.

On the other hand, the Mara River Basin has a Water Users Association, Mara Water Users Association (MWUA), the umbrella body for 25 WRUAs that are currently in different stages of formation. Sixteen of these are in the GMME, while nine are in the influence zone (upper catchment). However, Mara WRUAs lack the financial wherewithal to address water issues effectively. In view of this, WRUAs that are yet to be formed will be supported in the WRUA formation process. The capacity of these WRUAs to manage water resources will also be enhanced through training in different aspects of water resource management and funding to support their operations.

Action 3.3: Promote rainwater harvesting for domestic use, livestock, and irrigation

Rainwater harvesting for agriculture in the GMME can significantly augment surface water use in agricultural production and mitigate environmental problems, such as soil erosion. Harvesting rainwater to support meaningful irrigated agriculture requires that simple, appropriate and affordable rain harvesting technologies be availed to farmers. Thus, to enhance rain water harvesting for irrigation and domestic use, WRA will work with other stakeholders to sensitize the local community on rain water harvesting technologies to increase its uptake among the community. Communities will also be supported in the construction of water reservoirs to store rainwater. In this regard, lessons learned from similar rooftop rainwater harvesting projects that have been implemented in the GMME will be used to design new projects. Increased adoption of rain water harvesting, will reduce over dependence on rivers, excessive water abstraction from rivers, reduce livestock associated river bank erosion and water pollution. Moreover, adoption of rainwater harvesting will increase the community's resilience to climate change.

Action 3.4: Control pollution and siltation of rivers

Intense and poor farming practices and overstocking in the upper arable water catchments of the Mara River is a significant source of silt and water pollution noted in this river. Farm run-off that is rich in silt, farm chemicals, and fertilizers usually find its way to the river compromising the water quality. Other human activities, such as discharging waste, washing cars, bathing, and washing clothes in rivers are also blamed for water pollution. In addition, runoff from the urban centers in the river basins transport poorly disposed solid waste to the rivers.

To address water pollution and siltation of rivers in the Mara River Basin, farmers will be encouraged to use soil erosion control methods to reduce runoff flows and retain soil on their fields. In regard to this, WRA will work closely with the CGN Department of Agriculture to promote the adoption of soil erosion prevention practices, such as contour ploughing, terracing, crop mulching, crop rotation, planting perennial crops, and installing riparian buffers. And to minimize pesticide impacts, farmers will be encouraged to adopt Integrated Pest Management (IPM) techniques to minimise pesticide usage and thereby avert contamination of water bodies. In addition, to minimise the siltation of rivers, WRA and stakeholders will support the rehabilitation of riparian land and degraded catchment areas to increase vegetation cover. Furthermore, WRA and stakeholders will support the construction of check dams to control siltation of rivers from road run-off. And to further curb the deterioration of the water resource due to pollution, WRA will monitor river water quality and quantity, identify pollution sources, and take appropriate management or legal action on

polluters. Other measures to curb pollution will include encouraging livestock keepers to construct water troughs; disseminating recommended water quality standards to stakeholders; involving the local community in monitoring and reporting water pollution incidents; and discouraging car washing along rivers.

Objective 4: Wildlife conservation and management enhanced resulting in stable or increasing wildlife populations

The Mara-Serengeti Ecosystem is arguably one of the Earth's most important and iconic ecosystems. It is home to the world's largest remaining migration of terrestrial large mammals and exceptional abundance and diversity of animal and plant species. The 1.5 million migratory wildebeest in the Serengeti-Mara ecosystem move to Kenya between August and October Figure 14). This population has remained stable while the localized population has declined steeply from a population of 122,790 in 1977 to 23,510 in 2016. The Mara Ecosystem is also known for its high density of 21.5 lions per 100 km^2 and cheetah population of 0.66-1.39 adults/100 km^2.

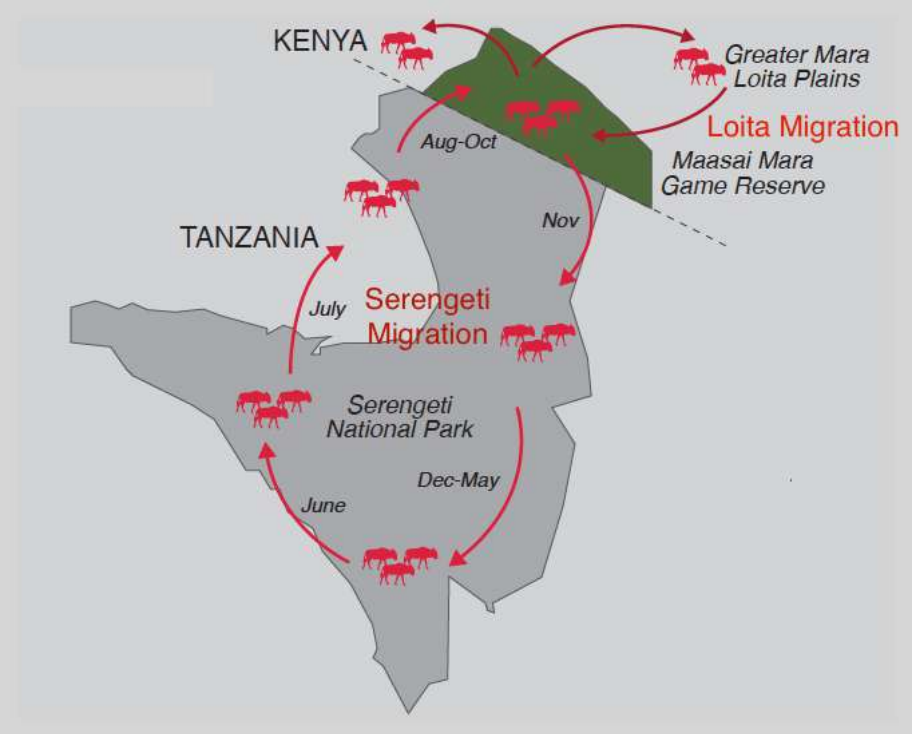

Figure 14. Migration of wildebeest in the Serengeti-Mara Ecosystem[52]

The Mara is Kenya's finest, most popular, and successful wildlife viewing area. Crucially, it supports almost 30% of Kenya's wildlife. Yet, the Mara is experiencing extreme loss of wildlife and their habitats, making it imperative that immediate, decisive, and far-sighted steps be instituted to save them. The remedial measures should be immediate because the

[52] Mara Conservancies CNR-CAP, 2015

window of opportunity to restore wildlife populations and their habitats is fast closing given the types, rates, and scales of the changes occurring in large parts of the Mara.

The future desired state at the GMME is, therefore, where threats to wildlife species are abated resulting in an increase in wildlife populations. Threats to wildlife habitat have been addressed under Objectives 1, 2 and 3 of this programme, hence, this objective address direct threats to wildlife, such as poaching, human wildlife conflict, and wildlife diseases. It also addresses the need to develop species recovery plans, maintain wildlife population monitoring programmes and cross-border collaboration in wildlife management.

The management actions that will be implemented to achieve this objective are elaborated in the following sections.

Action 4.1: Control wildlife poaching and HWC related wildlife killing

The recent national wildlife count showed that there are 52 Black Rhinos and 2 white rhinos in the GMME. Elephants were 2595. The populations of these two species are vulnerable to trophy poaching; hence their heightened protection measures that involve wildlife intelligence gathering to inform antipoaching operations, and intensive patrols to deter poaching.

Data from the Monitoring Illegal Killing of Elephants (MIKE) programme for the 2011-2019 period shows a decline in elephant poaching since the year 2012, but a significant number is still being lost to poaching and human wildlife conflicts (Table11). Bushmeat poaching of ungulates is also happening as attested to by meat and snare recoveries by KWS and its security partners, such as the Mara Elephant Programme and Mara Predator Conservation Programme. To ensure that wildlife poaching and HWC related wildlife killing are minimised, KWS will work with conservancies and other security partners in gathering wildlife intelligence and disseminating information to partners in a timely manner to ensure that information is acted upon to prevent poaching incidents. Towards this, the wildlife intelligence network in the ecosystem will be strengthened to facilitate information gathering and analysis. In addition, KWS will work with stakeholders in identifying poaching hotspots and conducting antipoaching patrols in these hotspots. The MIKE programme will also be supported to ensure that data on elephant deaths is continuously collected in accordance with MIKE data collection protocols. Elephant monitoring will continue to be supported through elephant collaring and tracking their movement. And to enhance rhino surveillance and protection KWS will ear notch rhinos and instal tele-transmitters on rhinos to facilitate rhino identification and monitoring. Human-wildlife conflict related wildlife deaths will be addressed by implementing measures outlined under Objectiove 3 of the Community Livelihood Programme.

Table 11. Mike data for the Mara Ecosystem form (2011-2020)

Year	poaching	HWC	natural	unknown	PAC
2011	15	10	3	3	1
2012	64	15	12	7	0
2013	58	12	19	1	1
2014	22	31	16	0	0
2015	11	16	9	6	1
2016	8	8	21	6	1
2017	4	10	11	7	1
2018	4	12	27	24	0
2019	5	9	24	22	1
Total	**191**	**123**	**142**	**76**	**6**

Action 4.2: Control and manage wildlife diseases

The perceived risk of disease transmission from wildlife to livestock has led to the massive eradication of wildlife in Africa[53]. There are several livestock and wildlife diseases that are endemic in the GMME some of which result in annual out breaks, while others are recorded throughout the year e.g., foot and mouth disease and tickborne diseases, such as East Coast Fever and Anaplasmosis. Some are zoonotic and can be transmitted to human beings e.g. rabies, anthrax. A summary of common animal diseases in the GMME and their status are given in table 10.

Table 12. Common animal diseases in the GMME

Disease	*Description*	*Comments*
Tick borne diseases (East Coast Fever and Anaplasmosis)	These are endemic diseases common among domestic cattle with occurrence recorded throughout the year.	No clinical cases of these diseases have been recorded in wildlife for the last 5 years though
Trypanosomiasis	• This is endemic in the area with peak infections during early rains • Trypanosoma species encountered are the *vivax* and *congolense* • Buffaloes are carriers of the disease	Prophylactic trypanocide drugs; acaricides to repel tsetse flies; Trapping of the tsetse flies to reduce their population
Foot and Mouth Disease	An endemic disease in the area with almost yearly outbreaks Buffaloes can harbour the disease	Annual livestock vaccination
Canine distemper	This viral disease is common in the area especially among stray dogs. The latest outbreaks were recorded in 2019 with several dogs dying	
Peste des petits ruminants (PPR)	This viral condition recorded in domestic small ruminants is also endemic in the area,	Occasional vaccinations conducted. Research on the presence and effect of this disease among wildlife species is on-going.
Rabies	Reported among domestic dogs and donkeys, though sporadic	Control of this is through annual vaccination of domestic carnivores during World Rabies Day. This is done by non-governmental organizations in conjunction with county veterinary department.
Anthrax	Though rare, cases in domestic livestock have been reported within the conservation area.	Annual vaccination by County Veterinary Department is carried out to prevent outbreaks. No case has been reported from wildlife species within the area in the last 5 years.
Echinococcosis	This parasitic disease is found in the area with clinical disease found in humans when they accidentally ingest eggs from infected carnivore faeces mainly.	

[53] Grootenhuis J.G. (2000) Wildlife, Livestock and Animal Disease Reservoirs. In: Prins H.H.T., Grootenhuis J.G., Dolan T.T. (eds) Wildlife Conservation by Sustainable Use. Conservation Biology Series, vol 12. Springer, Dordrecht. https://doi.org/10.1007/978-94-011-4012-6_6

Disease	*Description*	*Comments*
Bovine tuberculosis	This disease is found among the local human population. An investigation carried out in domestic animals in the past ending in the year 2013 revealed a number of domestic cows harboured *Mycobacterium tuberculosis*, causative agent of bovine tuberculosis.	
Sarcoptic mange (scabies)	Domestic dogs are known to harbor the mites. Through interaction between domestic animals and the wild cats-cheetahs and lions, the predators in the ecosystem are known to be affected	Regular disease surveillance and treatments of affected domestic and wild animals including control of domestic dog populations in the Market centres within the ecosystem

Currently, the County Veterinary Department is working with non-governmental organizations in vaccination campaigns for viral diseases to minimise their impacts. These organizations create awareness on preventing the diseases during the Annual Rabies International Day when vulnerable animals are also vaccinated.

To further minimise the impacts of diseases on livestock and wildlife, the County Government of Narok, Department of Livestock, in liaison with conservancies and land owners, will undertake regular livestock vaccinations to curb disease outbreak and spread. In addition, it will work with the KWS Veterinary Department to conduct disease surveillance and controlling disease outbreaks. Regarding this, the KWS Veterinary Department will conduct clinical investigations on all observed sick and dead wildlife to determine the cause of sickness or death. CGN will also work with conservation research organizations such as WRTI to conduct a study on wildlife diseases, implement a wildlife disease surveillance programme, and establish protocols on wildlife disease control in the ecosystem.

Action 4.3: Intensify monitoring of wildlife species whose populations are declining

There are several wildlife species of management interest in the ecosystem. Some have been recorded at the national level to be threatened while others are declining both nationally and locally. However, studies lack clear information and data to guide the management of these species at the ecosystem.

To correct this problem, a monitoring programme will be developed to provide a framework of species management and monitoring for the declining species (kongoni and topi). These two species will require local monitoring programmes to generate more data and information on population and movement trends over time. This will be done through regular census at a frequency determined by the researchers and collaring these species to understand their movement patterns, habitat use, and their interactions with people. The monitoring activities will endeavour to clarify whether the population is stable or declining and to establish the possible causes of decline where established. Special focus will be made to establish if there is poaching of these species or whether they have habitat requirements that may require specific interventions. In this role, plan implementers will work with KWS, conservancies and private researchers to implement the conservation programme.

Action 4.4: Establish well-coordinated wildlife population monitoring programmes

There is a lack of proper well-coordinated monitoring programmes for wildlife species in the ecosystem. The ecosystem wildlife and land use trends have been well-monitored by

DRSRS over the last 40 years. However, this has declined and become irregular over the last 10 years. For example, aerial surveys of wildlife have not been conducted in 2019 and 2020 while previously these were done up to several times per year.

KWS has also been monitoring the elephants, buffalo, and wildebeest populations and collaborating with Tanzania to conduct cross-border census of elephants and other large mammal species. But these are also irregular.

The ecosystem has other monitoring programs focusing on species, such as the lion, cheetah, leopard, wild dogs (Mara Predator Conservation Programme), elephant (Mara Elephant Project), hyena (Mara Hyena Project), and vultures (Birdlife International). Most of these programs are monitoring predator population trends and their key ecological variables through GPS collaring, individual identification, and camera trapping.

Besides supporting these monitoring activities, there is also a need for collaboration and coordination and where possible, combine resources to conduct joint regular aerial counts of wildlife (once every 2 years covering both wet and dry season), and establish a data platform to monitor and plan the management and conservation of these wildlife species.

Under this management action, therefore, WRTI will work with conservation research organizations (e.g. DRSRS, KWS, WWF), Mara Predator Conservation Programme, Mara Elephant Project, and Mara Hyena Project) to establish long term species monitoring programmes that will be generating information to support ecosystem planning and management.

Action 4.5: Support and strengthen collaboration in transboundary natural resource management

There is a need for collaboration in wildlife conservation and management between Kenya and Tanzania as the home ranges of several wildlife species cut across Masai Mara National Reserve in Kenya and Serengeti National Park in Tanzania (e.g., wildebeest zebras, elephants, Black rhinoceros, wild dog etc). This collaboration takes place between the Mara NR and Serengeti NP, but it is not strongly established legally and institutionally. Similarly, there has been collaboration in cross-border wildlife census in the Serengeti-Mara ecosystem but this collaboration has not been formalised and engagement structures are lacking. For maximum wildlife security, and to promote wildlife research in the ecosystem, the existing collaboration between Kenya and Tanzania will be strengthened to make it more effective and forge a stronger teamwork spirit across the states. Regarding this, transboundary quarterly security meetings, joint or synchronized antipoaching patrols and security information sharing will be supported.

TOURISM DEVELOPMENT AND MANAGEMENT PROGRAMME

Programme Goal and Guiding Principles

Programme goal

The following is the programme goal for the Tourism Development and Management Programme:

To develop sustainable tourism that offers memorable experiences to visitors and is a pillar for biodiversity conservation in the ecosystem

Mara, as a tourist destination, is Kenya's jewel. The national reserve has, on various occasions, won the prize for the leading safari destination in Africa. Studies have shown that 90 per cent of visitors to Kenya list Mara as their first-choice destination. The wildebeest migration between Tanzania's Serengeti and Kenya's Mara has been variously described as the world's greatest animal migration and one of the greatest natural spectacles. This has contributed to placing Mara on the global map as the best destination for wildlife safari. For this reason, Mara is reputed for the large populations of large mammals especially the iconic Big 5. It is the location for the National Geographic Large Cats Diary series and is beloved of visitors for the ease of spotting the large cats and other predators. Notwithstanding the national and international profile and glory, Mara tourism has experienced numerous challenges and triumphs.

The 1990s was a watershed period in Kenya. It was a period when there was unprecedented growth in visitor facilities and accommodations which was fuelled by private sector business instinct. Unfortunately, this growth was not guided by any set regulations and standards. This is the foundation behind the bad reputation of the Mara as a tourist destination with no standards in operations and with poor roads and associated infrastructures.

Around the same time, there were many changes in land policies that led to fragmentation and individual fencing of land in the areas neighbouring the national reserve. This led to encroachment of human activities and loss of wildlife habitats which also ignited spirited concern from stakeholders.

The changes in land use outside the national reserve led to the emergence of conservancies as a solution to further degradation and loss of wildlife habitat. The conservancies sought to increase space for wildlife through a business solution with tourism coming in to generate revenue to pay for the land leases in the conservancies. This conservancy movement has brought about a unique tourism product that is gaining appeal nationally and internationally.

Under the Narok County Government, there have been remarkable efforts to restore tourist services in Mara and upgrade the declining infrastructures. However, many challenges remain regarding:

- Poor reputation due to overcrowding of visitors during the migration, which gives the destination the label of a mass low quality destination;
- Poor perception as a place where park regulations are not well adhered to and visitors can harass wildlife at will and do off-road driving at the expense of ecological integrity; and

- Poor image due to shortage of vital visitor amenities like washrooms and viewpoints especially around the migration crossing points and entrances.

In addition to the above challenges, the following issues need to be addressed to restore Mara's glory:

- **Cost of tourism.** The selling chain for tourism is very expensive, taking up to 35% of tourism revenue. With accommodation facility estimated to take another 40% and the government up to 23%. This means very little reaches the land owners in the greater ecosystem directly, which is regrettable given that viability of conservation depends on the support of landowners in the ecosystem. A model is required that would ensure the cost of tourism reaches the landowners more directly to make tourism a profitable land use to the communities.

- **Cultural village business model**. As currently set up, the village manyattas are beset by two main problems: exploitation by intermediaries, mainly drivers and guides from tour companies who do not sell the business; and lack of a standard pricing and presentation model weakens the product.

  There is a need to streamline cultural villages as an important tourism product of the ecosystem product. A better system should be investigated that offers authentic culture but also ensures the local people are not exploited by the middlemen. It is therefore recommended that cultural villages are only allowed to be in or part of Conservancies for the equitable benefit of the conservancy landowner members.

- **New tourism frontiers.** There are emerging opportunities for adventure tourism like cycling and horse riding especially outside the reserve. Loita Forest was singled out for this potential. This demand is high especially among domestic tourists and needs to be supported with enabling infrastructures and policies. Another way to support it is to compile the business opportunities in form of a prospectus to be circulated to the many people who are looking for chances to invest in tourism.

- **Bilateral aid for infrastructure support.** Most conservancies are in dire need of infrastructures like roads, bridges, gates, dams etc. Bilateral aid should be prioritized to assist National and County governments in funding operational expenses of the National Reserve and conservancies. This plan strongly recommends that stakeholders in the ecosystem develop a programme specifically tailored at mobilizing bilateral aid for infrastructure support.

The strategic principles that have guided the development of this programme and which will be considered in its implementation are set out in the following section. Wherever appropriate, guidance has been drawn from global, national and county laws and policies, and relevant institutional plans and programmes of the plan implementers (CGN, MMWCA, KWS & WRTI).

Guiding principles

In implementing the Tourism Development and Management Programme, stakeholders will strive to adhere to the following principles:

Developing tourism as a tool for winning space for wildlife

Tourism in Kenya in general and Mara in particular is driven by the desire to see wildlife, especially the "Big 5" of Kenya's tourism, elephant, rhino, buffalo, lion, and leopard. However, despite their tourism importance, these large mammals are also the most affected by land use changes that have brought about habitat loss and fragmentation, which is the leading cause of wildlife decline in the GMME.

The WCMA, 2013 has provided for a market-driven solution to wildlife decline by creating a system that enables non-public land to host wildlife in exchange for income from wildlife. Section 4(e) of the Act provides that "*benefits of wildlife conservation shall be derived by the land user in order to offset costs and to ensure the value and management of wildlife do not decline*'. This is the logic behind the growth of wildlife conservancies that now constitute the greater Mara ecosystem and which has opened new frontiers in tourism in the country. The conservancies have created a large space for wildlife which have ecological connectivity with the MMNR and are making tremendous contributions to wildlife conservation in the GMME.

In addition, Principle 4 of CBD ecosystem approach guidelines recognizes potential gains from management, and requires that ecosystems are managed in an economic context. Hence, in line with this principle and the WCMA, 2013, GMME stakeholders will use tourism development as one of the tools for securing wildlife habitat in the nonprotected area of the ecosystem. Regarding this, the tourism sector stakeholders will be encouraged to secure the available nonprotected land to prevent further loss of habitat and decline in wildlife populations.

Marketing the GMME as a single destination

The GMME components (protected area, semi protected areas, and nonprotected areas) function as one ecological unit whose one of the key products is wildlife that supports the local tourism industry. These three components offer different visitor experiences based on the tourism values the host. Hence, given the ecological interdependence among the three GMME components, there is a need to also market the GMME as a single tourist destination offering different experiences in different locations. This will help spread tourism to areas with high tourism potential but are underutilized (e.g., Loita forest and some of the new conservancies). This is in line with NTB2030 which emphasizes that Kenya's tourism marketing should focus on the destination's experiences, and Principle 6 of the CBD ecosystem approach guidelines that prescribes that: "*ecosystems must be managed within the limits of their functioning".* Consequently, under this programme, GMME first be marketed in terms of its core experiences and secondly in terms of where the experience is in the ecosystem. This means the GMME marketing and branding will focus more on tourism experiences and their enhancement, rebranding of the destination, and positioning it regionally.

In addition, the different stakeholders in the ecosystem would create a powerful synergy by combining resources and forming a joint marketing platform. This will not obliterate or conflict with individual marketing activities by different players. Rather, it will form a single ecosystem unit for marketing that promotes the whole ecosystem as a destination and which supports all individual players in their respective market segments.

This should start by having a brand image and identity which all stakeholders can associate with and support. It should be followed by an ecosystem website for GMME that reaches out to the local and global audience with information about travel and conservation. And since marketing is an expensive undertaking, a united marketing unit, would come in handy with associated programmes like market research, public education, and public relations.

Developing a mix of low impact, high value, and medium density sustainable tourism product

Over a long time, the development of tourism facilities in the Mara Ecosystem has mainly been investor-driven, and therefore not coordinated with each other or with the wider interest of conservation and sustainability. Many facilities have been developed without due regard to their potential impact on the environment and the tourism product. This is what landed the ecosystem into the current crisis of facilities congestion especially in the areas around the reserve. The effects of such unregulated expansion are many. It can cause conflict among different investors resulting in poor quality services to the visitors.

Another major effect is that it dilutes the tourism product where the wilderness value of the reserve is eroded and many visitors and vehicles crowd in one area, causing a negative social and environmental impact.

Hence, under this management programme, stakeholders will promote a mix of low-impact, high-value, and medium density sustainable tourism products in the GMME. Towards this aim, the management plan creates zones that offer different visitor experiences. The MMNR offers medium-density tourism while the conservancies offer low impact, high value tourism. This is in line with Sessional Paper number 1 of 2010 on “Enhancing Sustainable Tourism in Kenya” that emphasizes code of practice and sustainability, and Principle 3 of the CBD’s ecosystem approach guidelines, which require that “e*cosystem managers consider the effects (actual or potential) of their activities on adjacent and other ecosystems”.* it is also in line with the NTB2030 that is geared towards improving tourism experiences at a destination. It places Mara as a frontline destination in offering African safari, culture and heritage experiences. But it also notes that these core strengths are not exploited to the maximum and there is a need to focus more on improving the existing experiences to fix and refresh the image. This is what the NTB 2030 summarises as strategic objective of “getting Mara right.” To get this right, the product needs to be looked into with a view to enriching and enhancing experience.

Providing memorable visitor experiences through development and improvement of tourism investment, infrastructure and services

The Mara Ecosystem and especially the reserve has grown in popularity at a rate not commensurate with customer service. For a long time, the infrastructures in the reserve have been poorly maintained, and operators incurring huge losses due to vehicle breakdowns while visitors experience delays and frustrations. This is coupled with inadequate infrastructures and amenities where visitors arrive at the entrances to the reserve and have no place for refreshments or modern washrooms.

With regard to MMNR regulations, the enforcement has also been very poor. There have been numerous reports of malpractices by tour drivers and other visitors with many images spreading internationally of people harassing wildlife. The Mara as a destination has acquired a negative image as the place for cheap standards and low customer experience. This is despite its fame as the best home of wildlife and migration spectacle. Realizing the need to compete with other destinations and correct the national image in terms of quality tourism, this management plan will develop proposals geared towards development of new and better infrastructures and regulation of and upgrading of accommodation standards. All these will ensure the ecosystem delivers a memorable visitor experience and boost the

image of the destination and the country. This is in line with the NTB 2030, which calls for deliberate efforts to mainstream infrastructure in the stakeholders' decision-making process so that this can be factored in budgeting and procurement processes. There is a need for emphasis on connectivity between the destination and other destinations in Kenya while also taking care of local road networks and other infrastructures in the ecosystem.

The NTB 2030 also emphasizes the corridor strategy and specifically points out the need to ease connectivity between the Mara ecosystem and other safari circuits, especially the Amboseli/Tsavo/Coast. On investment, the blueprint notes that the Mara ecosystem is a highly favourable destination for investments. However, it cautions that the investments in Mara need not be new ones since many studies show the area could be approaching or already exceeded its ecologically carrying capacity for tourism investments. The emphasis for the Mara should be on aligning current investments to the overall ecosystem goals of creating more land for conservation which supports the tourism product.

These strategic principles are intended to guide the implementation of the Programme's four management objectives that, when taken together, achieve the Programme Purpose. These four objectives are:

MO 1. Tourism product diversified and the destination image is enhanced
MO 2. Visitor facilities are diversified and standards improved
MO 3. Infrastructure network is well developed and maintained
MO 4. Marketing strategies are modernized and intensified

The following sections describe these management objectives and the corresponding management actions needed to achieve them. Under each management objective and action, a rationale and a description of how the objective or action will be achieved is provided.

Management Objectives and Actions

Objective 1: Tourism product diversified and the destination image is enhanced

The future desired state for the Mara product is a distinctive brand known for its high quality and top-notch standards. Currently, the brand image is compromised due to a variety of historical reasons that saw the collapse of vital regulatory controls. The phenomenal wildlife migration between Mara and Serengeti also tends to dominate the image of the Mara destination as just a wildlife viewing area. But what undermines the Mara's image the most is the perception that it is a place of low standards in terms of regulations. Under this objective, the plan proposes the development and enhancement of visitor services, enrichment of visitor information, and enforcement of regulations.

On product diversification, the plan promotes the development of infrastructures that support diverse experiences like walking and hiking through the provision of nature trails and viewing platforms. However, the plan does not seek the imposition of diversity that is not supported by market demands. Mara's comparative advantage remains expansive wilderness and

wildlife. Improving the quality of experience by preserving this wilderness value will take precedence over diversity, while upcoming new products will be supported and promoted.

The objective will be achieved through implementation of the following actions:

Action 1.1: Develop minimum tourism standards

Over-crowding within the Mara detracts from the visitor experience and impacts negatively on the environment (Figure 15). This also affects the destination as it fosters a negative brand perception that Mara is a mass low quality safari destination. Efforts are needed under this programme to improve the ecological integrity of the reserve by ensuring there are minimum standards in investments in line with zonation plans. In this line, there is a need to close facilities encroaching critical and fragile wildlife habitat and decongest some sections through licensing policies that limit investment in overcrowded areas.

Standards of operations also apply to tour guiding services. Minimum standards are also required in tour guiding and transportation as part of the efforts to repair the ecosystems dented image. All safari drivers will be required to have minimum training qualifications and belong to professional associations. The plan appreciates that there is no easy solution regarding this problem and will be careful not to impose standards or control measures that would alienate the tourism product especially from the domestic market. The plan implementers will benchmark with KWS on different approaches to enforce driver code of conduct and uplift tour guiding standards.

With the recent upgrade of Narok Sekenani road, it has been noted that there is an upsurge of visitation from local travellers using personal vehicles. The plan will encourage the growth of private transport to the reserve. Nevertheless, the plan stakeholders will work with local communities to have a system that encourages visitors who come in private cars to hire local guides and better game drive vehicles at the entrances. This will create employment and spur more business opportunities

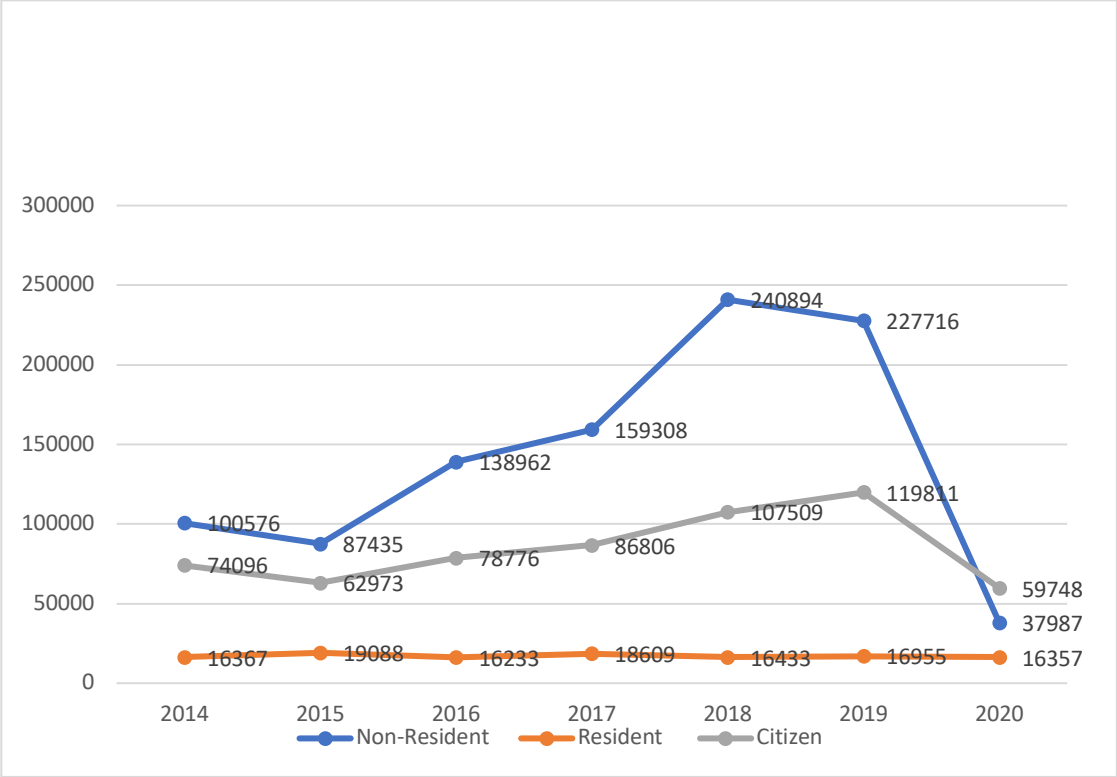

Figure 15. MMNR visitation

Action 1.2: Enhance and identify new and unique niche tourism products for tourist attraction

The lack of product diversification in Mara limits its market potential by locking out many visitors whose safari interests are not catered for or whose knowledge is poor. To make the Mara ecosystem more attractive, there is a need to make the product more diverse to cope with the competition with competing destinations. To realise this, supporting infrastructures will be provided to enable the exploitation of underutilized areas and attract investors away from the high-density core areas in the reserve and conservancies.

There will be a need to survey the ecosystem and identify potential scenery and landscape features that would support product diversification. Corresponding infrastructures will be developed to support different activities like nature walks, hiking, birding, etc.

For better effectiveness, the plan implementers will conduct benchmarking studies on the diversity of tourism products in competing destinations and then conduct regular sensitization programmes with stakeholders to determine permissible products in the ecosystem.

Action 1.3: Develop product targeted to domestic tourists at the conservancies

Conservancies make a significant contribution to conservation and tourism development in Kenya. They emerged as an innovative way to secure more habitat for wildlife by making the wildlife to pay for the land through tourism. This also brought about a new product of conservancy safaris by offering an exclusive and very rich wildlife experience to visitors. In the process, the conservancies have unwittingly carved an image as exclusive areas for foreign tourists that exists at the expense of local communities, and that discriminate against domestic tourists through expensive pricing. Because of their history and the fact that the model is still new, conservancies cannot afford the continued negative image as they need social and political goodwill. There is, therefore, an urgent need for conservancies to collectively work with stakeholders and the county government to roll out programmes that endear the conservancies to the public and revise the negative perception and image.

To enhance the usage of conservancies by domestic tourists, a sensitization campaign will be conducted on the important role of conservancies in conservation and tourism and benchmark with KWS on Domestic Tourism campaign to attract local visitors. This will give way for the development of incentive packages for local tourism such as family/couple annual passes.

Finally, the plan implementers will work with the local communities in management and public activities to demonstrate that conservancies have goodwill of the local communities.

Action 1.4: Explore control of visitor numbers around migration crossing and peak season

The Mara wildlife migration attracts many local and international visitors into the ecosystem, leading to heavy vehicle and visitor congestion during tourism peak season. Congestion has contributed to the brand's poor image as a destination for mass tourism which undermines the tourism value. This plan proposes an innovative approach to managing the congestion by increasing the market value and premium of migration. First, a study will be conducted to determine a healthy carrying capacity of visitors by benchmarking with competing destinations on congestion management. Then a maximum number of visitors will be set per season per day and the ceilings will be implemented gradually as the system is tightened. Advance booking and ticketing for migration will be introduced to ensure the set limits are adhered to and the value is improved by marketing migration opportunities as a "scarce

product." To modernise campsite bookings, a central reservation system will be developed at the reserve.

Objective 2: Visitor facilities are diversified and standards improved

The future desired state of visitor facilities in the GMME is one where the destination offers a rich diversity of visitor facilities that reflect different market niches and tastes. Although the Mara destination is regarded as heavily swamped with accommodation facilities (Figure 16), there is concern that most facilities offer the same experience with little differentiation in terms of design and services.

Regarding standards, the plan supports the development of minimum guidelines and regulations for investment facilities. For instance, there should be controls on how high up a property can rise, external colour schemes and lighting etc. On the side of regulatory approvals, the plan proposes that all investments adhere to NEMA standards and all national and county government licensing conditions.

However, the plan will not impose standards of tourism accommodations beyond the above minimum standards. While supporting the efforts of the Tourism Regulatory Authority to carry out star rating, this will not be allowed to kill imagination and innovation in hospitality services in the ecosystem by prescribing rigid styles and standards which can better come from the market itself.

Another concern is that many facilities in the ecosystem make little contribution to conservation. The ALU 'State of Wildlife in Kenya' report 2020 estimates that only 0.5% of Kenya's gross tourism income goes to landowners in the greater wildlife ecosystems that hold 70% of the country's wildlife. There is an urgent need to seek ways of pushing this figure up so that landowners support conservation as a rewarding land use. One strategy is prescribing a minimum space for tourism facilities. Since most tourist facilities in the Mara are outside the reserve, most of this money would be available to secure wildlife Conservancies in the Greater Masai Mara Ecosystem.

Additionally, the tourism selling chain of travel agents and destination marketing companies will be required to support conservation by allocating a percentage of their gross income to conservation leases and biodiversity easements.

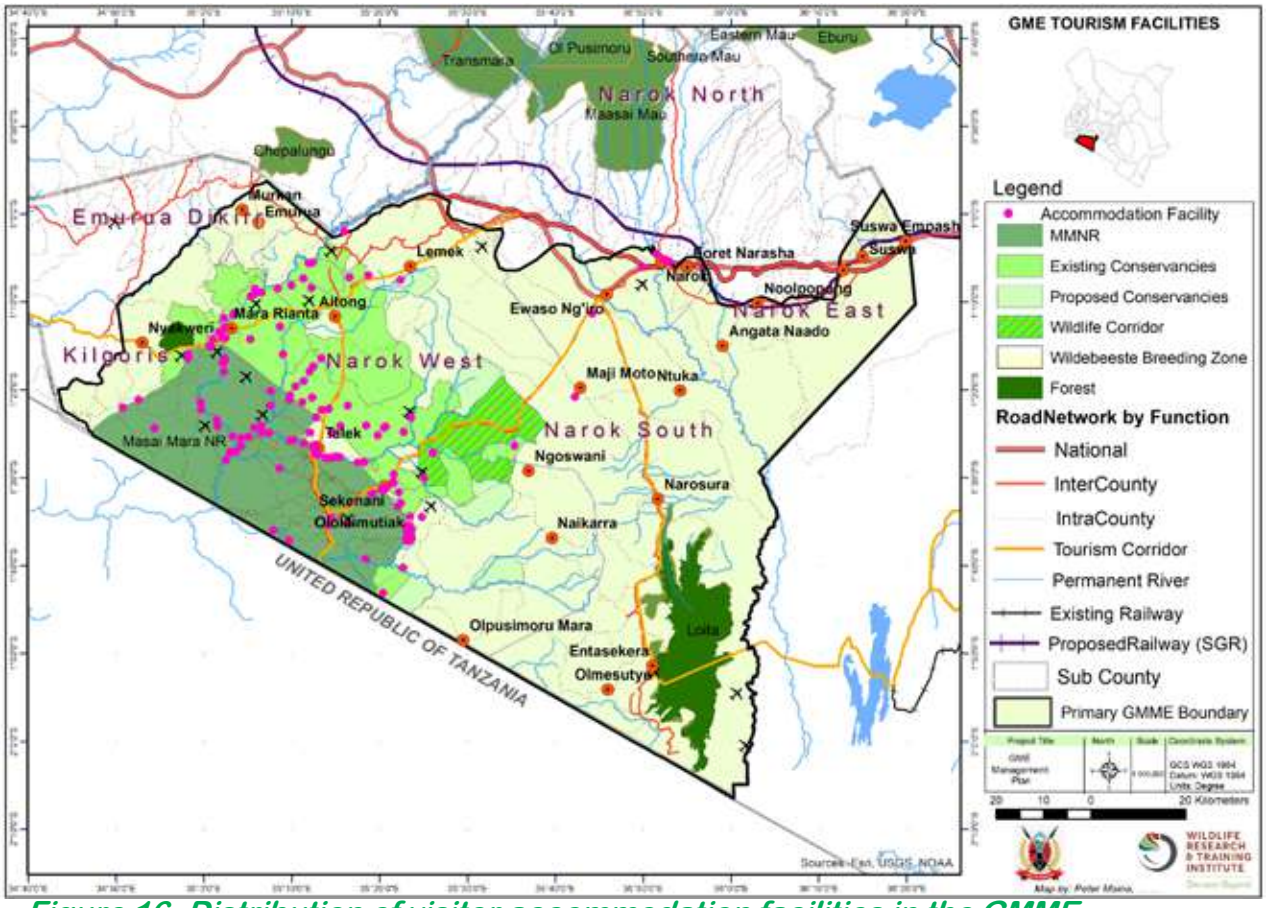

Figure 16. Distribution of visitor accommodation facilities in the GMME

To achieve this objective the following actions will be implemented:

Action 2.1: Streamline tourism business licenses and approval guidelines

Over-development of tourism facilities inside and at the edges of the reserve has negatively affected the destination's image. Uncontrolled tourism development means many facilities are crowded at some locations, such as Sekenani and Talek areas, and some of them are of questionable standards, which hurts the collective Mara image. This calls for action to create order and improve the brand image along with the standards of the facilities to enhance visitors' experiences. To curb this, approval standards for all facilities will be developed followed by strict enforcement of approval and licensing regulations. Audits of these facilities will also be conducted on a regular basis. Further, the CGN will standardise all leases in all facilities within the ecosystem.

Action 2.2: Develop minimum space prescription for tourism investments

The crisis of congestion of tourism properties in some sections of the ecosystem is partly because many investors are based on private land outside the reserve but use the reserve for their visitor wildlife experience. This means such investors contribute to congestion without making a corresponding investment in conservation inside or outside the reserve.

This plan recommends that all tourism facilities - inside and outside the Mara National Reserve - to conditionally commit to securing a minimum amount of land in the Greater Maasai Mara ecosystem. This will serve a dual purpose of: providing finances to secure more land for conservation through leasing all the available land in the nonprotected area of the greater ecosystem; and encouraging properties to be smaller in size and charge more per client by increasing the experiential value of the stay.

This action will cumulatively lead to more space for wildlife and enhance the tourism product and services in the ecosystem. This is a bold and radical initiative and stakeholder consensus will be developed first to avoid antagonizing key stakeholders. After developing consensus, a prescription for land space will be developed and implementation mechanism discussed with CGN to ensure smooth enforcement. Licensing of all tourism facilities will then be tied to the prescribed minimum space.

Action 2.3: Mobilize tourism stakeholders to support the land leasing and conservation easements to secure critical dispersal areas that sustain the Mara tourism brand

The selling chain for tourism is very expensive, taking up to 35% of the tourism revenue, with accommodation facilities estimated to take another 40% and the government up to 23%. This means very little reaches the land owners in the greater ecosystem directly, which is regrettable given that viability of conservation depends on the support of landowners in the ecosystem.

An ideal model is one where the benefits of tourism reach the landowners more directly to make tourism a profitable land use to the communities. One way is to explore the use of payment for ecosystem services for all nature-based tourism. The management plan proposes that the tourism selling chain of travel agents and destination marketing companies are mobilized to support conservation by allocating a percentage of their gross income to conservation leases and biodiversity easements. However, tourism stakeholders will be consulted to win stakeholder consensus.

Action 2.4: Regulate commercial development through spatial planning compatible to conservation

The new highway to Mara (from Narok to Sekenani Gate) has greatly enhanced communication as it was a critical battlement to smooth movement. However, the road also spurred a wave of commercial development and expansion along the highway which is detrimental to conservation of the ecosystem if not controlled and managed. There is therefore an urgent need to manage this commercial expansion by ensuring it does not encroach uncontrollably to the conservation area and does not endanger wildlife.

To do this, baseline data will be collected on the current status of commercial development along the highways. A development plan along the mushrooming centres along the highway will be developed with the County Government and the communities will be engaged to abide and implement actions from the county spatial development plan.

Action 2.5: Develop an investment prospectus

Although the ecosystem is reputed as overdeveloped with visitor facilities, there is industry consensus that a huge untapped investment potential exists. Observers believe there are many opportunities within the conservancies that have not been exploited, and this amount to wasted potential as conservancies are urgently desirous of income to pay leases to the land owners and ensure the viability of the conservancy model.

There is a need to market these opportunities to potential investors. This will be done by conducting a survey within the ecosystem to identify investment sites and business opportunities (e.g., camping, self-catering facilities, guest houses, hostels etc). This will then lead to production of a report on investment opportunities in the ecosystem. This prospectus will be disseminated at investment summits, locally and abroad, to attract more investments into the ecosystem.

Action 2.6: Set up and maintain a facilities database

The destination currently lacks an accurate inventory of tourist facilities which can guide a comprehensive and effective audit and standards management. To correct this, a comprehensive database of tourist facilities in the ecosystem will be developed and maintained. The database will have information on the facility geographic location, type, bed capacity, star rating, and compliance with the relevant laws. This database will be continuously updated and information used for monitoring and enforcement.

Objective 3: Infrastructure network is well developed and maintained

The future desired state of Mara ecosystem is a destination with a sufficient network of serviceable and well-maintained infrastructure to ease visitor access and enhance experiences. Well maintained infrastructures also keep the cost of offering services in the ecosystem low as hotels and tour operators do not experience frequent vehicle breakdowns. There has been concern among stakeholders in Mara that many areas lack vital facilities, which undermines the image of the ecosystem as a tourist destination of repute. Areas that lack suitable and basic amenities will be identified and such infrastructures developed. The existing infrastructures will undergo routine maintenance which is also cheaper for the park management as opposed to upgrading damaged infrastructures. This objective will be realized through the following actions:

Action 3.1: Institute a maintenance programme for roads and airstrips

The GMME can be accessed by road and Air from Nairobi. In the case of road access, the ecosystem can be accessed via the Nairobi-Mai Mahiu-Narok-Sekenani road, which is tarmacked. By air there are daily flights from Nairobi at Jomo Kenyatta International Airport and Wilson Airport. The GMME has several private and public airstrips most of which are used by tourists to access the area (Table 13 & Figure 17). An international Airport, Angama, is under construction at the Siria escarpment to facilitate tourism in the area.

The airstrips in the ecosystem are poorly maintained while the road network is insufficient, and not maintained to standards commensurate with the destination's reputation. Good infrastructures have many advantages including enhancing visitor experience and lowering the cost of visit. It also helps the management with easy enforcement of park regulations as tour operators can abide by instructions. In this regard, all viewing tracks and access roads will be designated and illegal tracks closed. The reserve management will also enforce rules against off road driving. A signage format and standard will be developed and all-important areas in the ecosystem will have proper signage. To support product diversification stakeholders will lobby for development of a road network that connects the Mara ecosystem with Amboseli through Magadi/Loita areas (Figure 18). Finally, the plan will formalise and consolidate road and storm water development and management plans within the reserve and conservancy areas.

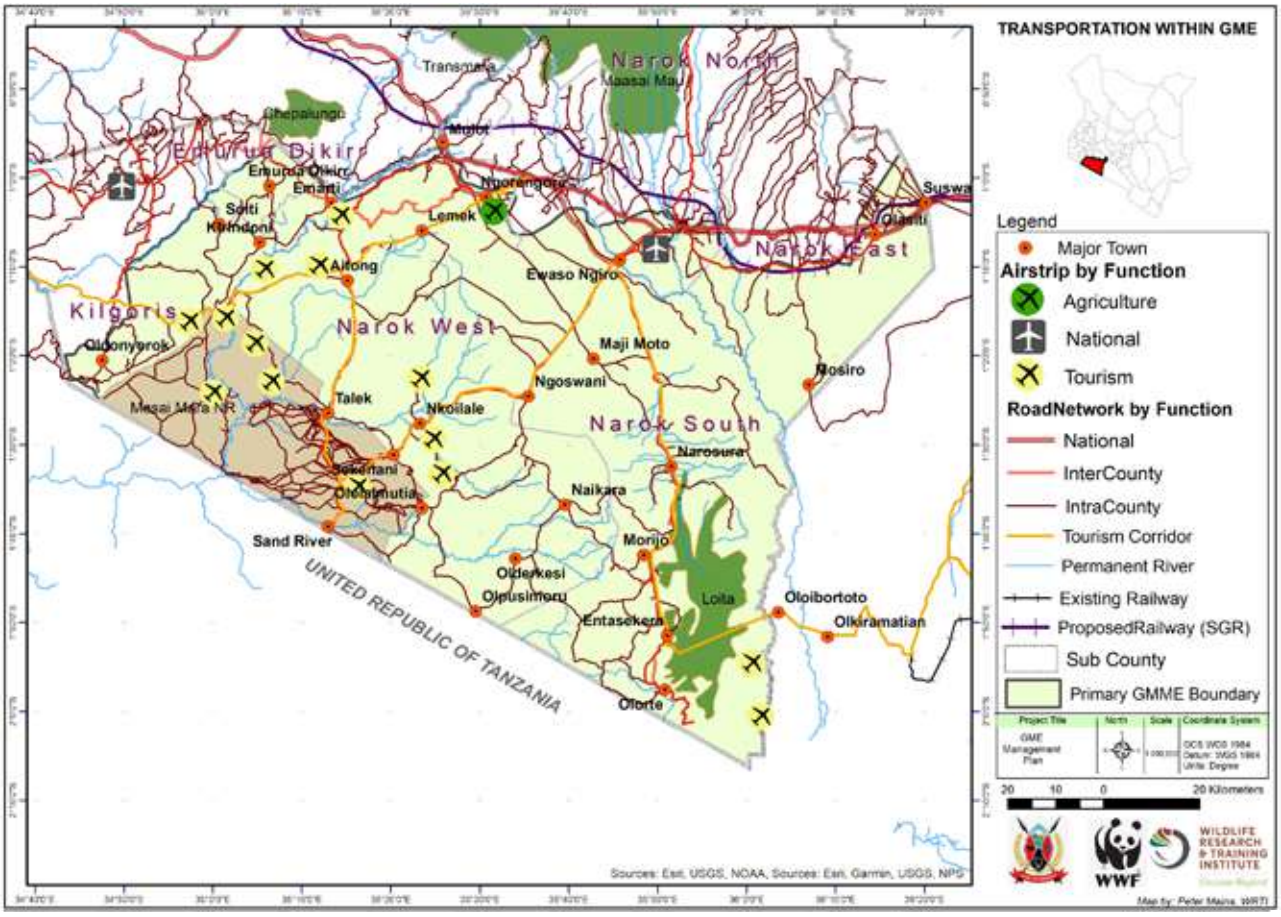

Figure 17. Road and Air access to GMME

Table 13. Tourism Airstrips in GMME

Name	Ward	Surface	Ownership
Angama	Lolgorian	Tarmac	National Government
Siana	Siana	Gravel	Private
Keekorok	Siana	Gravel	County government
Olkiombo	Mara	Gravel	County government
Musiara	Mara	Gravel	County government
Serena	Kimintet	Gravel	County government
Cottars	Naikara	Gravel	Private
Ngerende	Mara	Gravel	Private

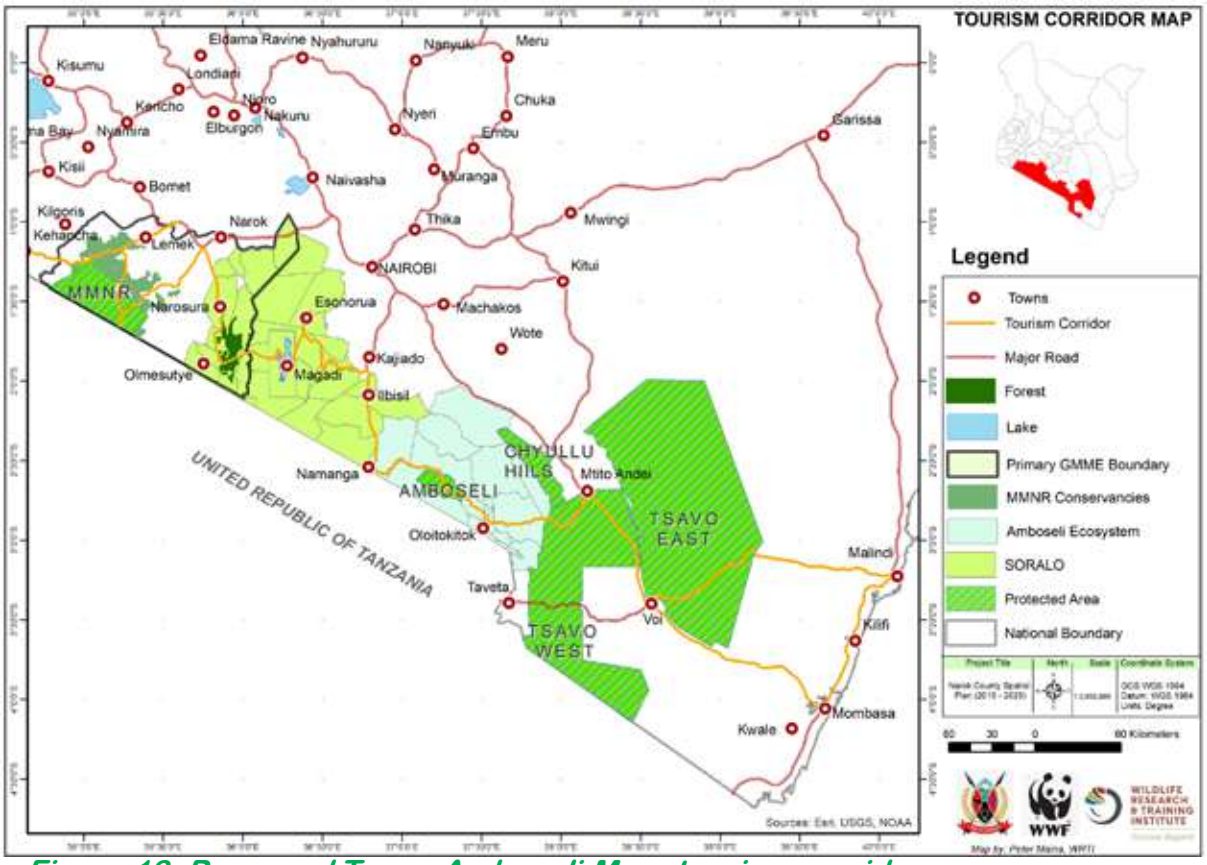

Figure 18. Proposed Tsavo-Amboseli-Mara tourism corridor

Action 3.2: Upgrade existing and increase visitor amenities

Substandard visitors' amenities hurt the brand's image and diminish visitor experience. To reverse this trend, the existing amenities will be upgraded and new ones established in suitable locations. There is a need to develop a standard for all amenities and facilities and ensure that they meet international standards. Then identify all strategic areas and locations where amenities and facilities call for upgrade or new ones to be set up. The first step will be to set minimum standards for visitor amenities aligned to international standards for all the amenities like washrooms at the gates and airstrips. Then new amenities will be developed in areas where this is necessary, such as migration crossing view points and other observation areas. Such amenities include viewing platforms, bird hides, and mobile restaurants.

The plan implementers will also work with the private sector to introduce modern recreation facilities such as food and beverage shops within guidelines of conservation areas. The private sector will also be engaged in the provision of essential services next to the main entrances like Sekenani and Talek. Such services include basic banking (ATM), vehicle hiring services, and vehicle workshops.

Action 3.3: Identify suitable location/s for tourist information and education centre

Lack of tourist information and education centres is a major drawback for the ecosystem. It eliminates opportunities for visitor engagement, especially for learning institutions and other specialised visitors like researchers who form an important tourism component in many similar destinations. A modern and well-equipped education centre is a great tourist attraction and serves as a repository for wildlife and research information which is easy to share with visitors and stakeholders.

The plan makes a strong endorsement of the Tourism and Wildlife College of Mara whose construction has already started. The plan implementers will be encouraged to explore chances of combining the education centre with the college to minimise duplication of efforts and resources.

There are also basic facilities that serve as information centres at Talek and Sekenani. As a first step, there will be need to assess the current information centres and their capacity and decide whether these should be upgraded instead of starting the project afresh. The other option is to assess whether the education and information centre can be combined with the upcoming college of wildlife in Pardamat Conservation Area.

If a new education centre is preferred, benchmarking will be done with competing destinations. Then bids will be issued for the construction and equipment of the centre. Once developed, a staffing and management programme for the centre will be developed.

Action 3.4: Monitor the effects of the upgraded Narok - Sekenani Road

The newly tarmacked highway to Sekenani Gate has greatly improved access of the famous ecosystem to many people who would be discouraged from visiting by the poor state of the access road. The road made it difficult for people to visit Mara without powerful and expensive vehicles, and the road conditions made vehicle services expensive.

The new road has reportedly led to an upsurge of visitors, especially from Nairobi, who now drive themselves to the reserve gate from where they hire vehicles for game drives. This is a welcome development as it brings more income to the local communities who have a chance to sell other services like food and accommodation. There are concerns that many youthful groups are now pooling transport and entering the reserve in large groups that infringe on the reserve rules with abandon. While appreciating the growth in domestic tourism, the road is expected to introduce other externalities that may be injurious to ecosystem integrity, such as land fragmentation, pollution, and more physical structures. These activities will need to be monitored closely to inform ecosystem management. The private visitors will also be engaged through regular feedback surveys to gauge their perception of the product and services. In addition, the plan implementers will strictly enforce laws against littering and provide receptacles for litter disposal at strategic locations.

Objective 4: Marketing strategies are modernised and intensified

The future desired state for Mara is a tourism destination that is well known and appreciated locally and globally due to its rich cultural and natural heritage. To realise this objective, the marketing efforts for the ecosystem must be stepped up, consolidated and modernised to reach the modern traveller. The ecosystem has hitherto relied on marketing by individual tour operators and lodges. While this is still expected to continue and should be supported, the

marketing efforts would be enhanced through a united front by all stakeholders marketing Mara as one destination.

This management plan proposes modern marketing methods and sustained campaigns to engage the public. This lack of a modern marketing campaign has the ecosystem losing on the chance to disseminate information notwithstanding that it has one of the most progressive conservation models in the world. For this to succeed, there is a need for budget support which can be sourced from bilateral institutions that are currently supporting other programmes in the ecosystem. A strong budget would enable the ecosystem plan owners to seek the services of a competent marketing agency, which would help in information dissemination and image management.

To achieve this objective, the following actions will be implemented:

Action 4.1: Develop a distinct brand image for the Mara destination

Lack of a common brand for the ecosystem and destination hampers marketing efforts as there is no universally accepted brand image. A great destination like the Mara ecosystem requires well developed brand symbol complete with a slogan or tagline that all stakeholders use in their marketing. This will then get established in the minds of the public as a mark of what Mara stands for. A good brand image consolidates its market and customer affection and engagement.

To achieve this, a brand concept, *One Mara Brand*, will be developed. This will be used to determine a common and acceptable image for the Mara Ecosystem through consultation among the stakeholders. Brand development will be done using the services of reputable design and marketing agencies where the winning design will be adopted as a signature brand for the Mara ecosystem and popularized through campaigns to ensure it acquires public recognition and respect. Part of the brand strategy will be to ensure that the Mara Ecosystem stands out as a world leader in community-led conservation and tourism.

At the same time, the plan implementers will work with stakeholders to pursue the designation of Mara as a World Heritage Site for added brand value and recognition. This will go a long way towards correcting Mara's "low standards" image.

Action 4.2: Establish a common destination marketing platform

Disjointed Marketing strategy by service providers leads to information gaps as individual operators emphasise their services and strengths. It also leads to unfair marketing competition instead of channelling the efforts towards a collective success of the destination and its resources.

The management plan will create a joint marketing secretariat hosted by one of the implementing partners. The secretariat will be presided over by a joint marketing committee from the major players in the ecosystem who will operate according to prepared terms of reference.

Online marketing will be preceded by identifying a suitable website domain name to pave way for developing a Mara ecosystem website primarily for marketing the destination. The website will have a directory of all partner companies and institutions and will seek to create collective synergy of all partners.

Action 4.3: Conduct regular market research and knowledge management

The lack of information centres in the Mara also implies poor collection and storage of vital data that can inform continuous management and marketing of the destination. This leads to loss of market opportunities. As such, there is a need for a robust research programme to improve understanding of tourism trends, emerging markets and customer demographics and needs.

The management plan will make provision for annual visitor satisfaction surveys, which can be contracted to a consultant or learning institution. This can be done simultaneously with online feedback forms at the ecosystem website where visitors to Mara can give anonymous feedback. These efforts will be complemented with physical visitor satisfaction questionnaires for random distribution at suitable outlets such as gates and lodges. There will be a need for a feedback collection and analysis system to ensure important ideas and complaints are addressed. This can be done by appointing a specific office to oversee collecting and analysing feedback and sharing it with relevant tourism stakeholders.

Action 4.4: Modernize marketing tools and techniques and adopt innovative strategies to capture more market

There is widespread concern among ecosystem stakeholders that Mara relies on its traditional name as the home of the “Big 5” and the renowned migration to market itself without any additional initiative. Also, the existing marketing techniques are outdated in time and in terms of technology. To cope with changing consumer trends, there is a need to keep up with evolving marketing technology and do away with old fashioned strategies.

The first step will be development of an electronic marketing strategy in consultation with the private sector. This will allow for the identification of specific platforms for electronic marketing targeting local and international audience such as advertisements on CNN/BBC, and You-tube documentaries. The marketing programme will also create social media accounts (Twitter, Instagram, and Facebook) and establish a full-time social media engagement programme to ensure these accounts are busy and serve their marketing value. The management plan will place less emphasis on traditional marketing forums like trade fairs and old tools like maps and brochures. For better success, the programme will benchmark with successful marketing campaigns in the private sector entities like lodges and tented camps and seek cooperation and marketing partnerships.

Action 4.5: Initiate an image management programme

Mara is Kenya’s flagship tourism product. Whenever it suffers an identity crisis, it also affects the national image. The destination has hitherto been beset with a negative image as a destination that allows or tolerates irresponsible tourism. There are numerous reports of off-road driving, animal harassment, physical aggressions and full-blown conflicts among the tour guides, and lack of adherence to park regulations.

Efforts must be made to remove the notion that Mara is a care free destination without standards. This will require a deliberate programme geared towards improving standards of tour guiding and adherence to park regulations. The first step will be the development of an ecosystem-wide code of conduct for tourism operators. These will be well disseminated in the industry locally and internationally and will include penalties for non-adherence. The existing by-laws will be reviewed to ensure they reflect the desired standards and the management plan will work with reserve management to identify implementation and enforcement weaknesses. This will pave the way for strict enforcement of rules and regulations consistently and without compromise.

Regular training will be conducted for the enforcement officers, reserve and conservancy managers to appreciate the importance of enforcing regulations in protected areas. Also, reserve by-laws will be broadcast through proper and visible signage in all strategic locations.

Because it is hard for reserve personnel to be everywhere simultaneously, a whistle blowing mechanism will be introduced where visitors can report malpractices anonymously. For this to succeed, there will be a need to ensure that all reported cases are acted upon transparently and in accordance with the law.

Of late there has been tension and conflict between local tour guides based in the ecosystem and their counterparts who bring visitors from outside the ecosystem. This tension boils over leading to poor teamwork and cooperation, which hinders visitor experience. The management plan implementation committee will study this problem, understand the cause of the misunderstanding and propose an amicable strategy to manage it.

COMMUNITY LIVELIHOOD PROGRAMME

Programme Goal and Guiding Principles

Programme goal

The following is the programme goal for the Community Livelihood Programme:

To enhance community participation in sustainable natural resources management to improve community livelihoods

The following section sets out the strategic principles that have guided the development of this programme and will be considered in its implementation. Wherever appropriate, guidance has been drawn from the following national and county laws, policies, and relevant institutional plans and policies of the plan implementers (CGN, MMWCA, KWS & WRTI).

Guiding principles

In implementing the Community Livelihood Programme, stakeholders will strive to ensure that:

Communities in the GMME are receiving tangible benefits from conservation

The Constitution of Kenya (2010) Article 69 (1)(a) imposes an obligation on the State to ensure sustainable exploitation, utilisation, management, and conservation of the environment and natural resources while ensuring equitable sharing of accruing benefits. Further, the Wildlife Act (2013) Section 4 (e, f & g) provides that benefits are derived from wildlife conservation to offset the costs of managing wildlife and ensure its value does not decline. Section 71 (1) provides “every person the right to reasonable access to wildlife resources and entitles such a person to enjoy the benefits accruing from wildlife.” Section 76 (4&5) on Guidelines on incentives and benefit-sharing provides that the guidelines on benefit-sharing shall comply with the minimum conditions that “a minimum of five percent of the benefits from national parks shall be allocated to local communities neighbouring a park and that private investments in conservancies shall benefit local communities and investors shall provide such benefits by applying various options including infrastructure, education, and social amenities.” Access to wildlife resources is recognized as a legal right under the Act for landowners and communities involved in wildlife conservation and living with wildlife.

Strategy Pillar 2 of the National Wildlife Strategy 2030 aims at engaging Kenyans in recognizing the value of wildlife and embracing their role in conservation through initiatives such as incentive programmes that enhance access to benefits and promote participation. It highlights indirect economic benefits from wildlife conservation, such as protecting water catchments and genetic resources and tangible benefits, such as jobs in the tourism and conservation sectors. These benefits must not only outweigh costs but should also be equitable and sustainable.

Pillar 2 Priority 5 of the KWS Strategic Plan provides that KWS commits to ensuring that every interaction with communities and individuals leaves them with a sense of pride, inclusion, and ownership and makes them valuable contributors to wildlife conservation.

According to MMWCA strategic plan 2020-2025, MMWCA, in fulfilling its mission, will ensure that conservation is a viable land use and local communities derive substantial long-term benefits from conservation-related revenue, which can be utilized for their local development needs. In its theory of change, MMWCA strives to increase land under conservancy operations to improve outcomes for wildlife while ensuring reduced human-wildlife conflict through enhanced security and ensuring a more significant number of community members receive direct benefits from conservation. In addition, to support conservancies to have resilient and diversified revenue models, MMWCA strives to enhance and diversify the revenue models of conservancies and increase benefits to landowners over time while effectively managing risk against future disturbances[54].

Moreover, Goals 2 and 15 of the global Sustainable Development Goals (SDGs) provide for equitable sharing of benefits arising from the use of genetic resources and associated traditional knowledge and ensure the conservation of ecosystems, including their biodiversity, can provide essential benefits for sustainable development. At the global level, Article 15-7 of the CBD advocates for the conservation of biological diversity, the sustainable use of its components, and fair and equitable sharing of the benefits arising from the utilization of genetic resources. It includes access to genetic resources, transfer of relevant technologies, and utilization of such knowledge, innovations, and practices.

In view of the foregoing, the Community Livelihoods Programme will strive to ensure that the community in the GMME is receiving benefits from the conservation of natural resources.

Improving Human-Wildlife Co-existence

Substantial costs, both in terms of livelihoods and personal safety, can ensue when humans live alongside wildlife. Negative interactions with wildlife can lead to negative attitudes and behavioural intentions, such as retaliatory or pre-emptive wildlife killing. Consequently, conservation strategies are increasingly adopting human–wildlife co-existence approaches to minimize the costs associated with living with wildlife by providing direct or indirect benefits. Co-existence is defined as a dynamic but sustainable state in which humans and wildlife co-adapt to living in shared landscapes, where human interactions with wildlife are governed by effective institutions that ensure long-term wildlife population persistence, social legitimacy, and tolerable levels of risk. Article 69 (1) of the Constitution of Kenya addresses the rights of the environment by providing that the State shall ensure the sustainable exploitation, utilization, management, and conservation of the environment and natural resources and ensure equitable sharing of the accruing benefits. Moreover, the NWS (2030; initiative no. 7) seeks to 'enhance partnerships and collaboration with all stakeholders to foster human-wildlife co-existence.' Therefore, implementing actions and activities to foster HW co-existence is done with the hope that people will foster positive attitudes and behavioural intentions towards wildlife.

Moreover, people's attitudes and behavioural intentions are not necessarily linked, and thus both need to be understood for conservation actions to be effective. The human-wildlife co-existence principles are anchored on the WCMA, 2013 section 19 (h), which aspires to "develop and implement, in collaboration with community wildlife associations, mechanisms for mitigation of human-wildlife conflict, and (i) review and recommend claims resulting from loss or damage caused by wildlife for payment of compensation." The National Wildlife Strategy 2030 states that a "major cause of human-wildlife conflict is competition for finite

[54] MMWCA Strategic Plan 2020-2025 (Goal 5)

natural resources and the situation is exacerbated by the exponential growth of population and changes in land use, human settlement, urbanization, and large infrastructure projects." In response, Kenya Wildlife Service and its partners seek to engage with communities living near wildlife and address agricultural expansion and increased livestock numbers. These pressures are edging out wildlife in the critical wildlife dispersal areas resulting in escalating human-wildlife conflicts. Further, the KWS Strategic Plan 2019-2024 identifies "land use conflicts as a threat to conservation and seeks partnerships and good relations with communities and other stakeholders to improve harmonious co-existence between humans and wildlife." In line with these strategic documents, the Community Livelihood Programme will strive to improve human-wildlife co-existence.

Enhancing conservation education and awareness

The NWS 2030 specifies the conduct of outreach and awareness activities, conservation education and curriculum development, and incentive programmes to enhance access to benefits and promote participation. Further, one of the functions of KWS is "*promotion and undertaking of extension services to enhance wildlife conservation, education and training."*[55] According to the KWS Strategic Plan 2019-2024, to win more space for wildlife requires strengthening engagement with the public, youth and communities through education and awareness. Therefore, one of the guiding principles under this programme is enhancing conservation education and awareness to gain support for conservation.

Livestock remains the mainstay of the local community

The Constitution of Kenya 2010, National Wildlife Strategy (NWS) 2030, and the Wildlife Conservation Management Act, 2013 consider Kenya's burgeoning population that necessitates changes in land use, including developments in infrastructure, urbanisation, and changes in crop husbandry, livestock keeping and irrigation.

The Agricultural Sector Development Strategy 2009-2020 recognizes that the agricultural sector is the driver of Kenya's economy and the means of livelihood for most of the Kenyan people. The plan aims to strategically position the agricultural sector as a key driver for delivering the 10 percent annual economic growth rate envisaged under the economic pillar of Vision 2030.

According to the Narok County Integrated Development Plan 2018-2023, livestock rearing is one of the main economic activities supporting most rural household livelihoods in food security, employment, and income generation. Livestock species comprise cattle, sheep and goats, poultry, bees, rabbits, donkeys, and other emerging livestock.

In line with the national and institutional laws, policies, and plans outlined above, one of the guiding principles for the Community Livelihood Programme is ensuring that livestock remains the primary source of community livelihoods in the GMME.

These guiding principles are intended to guide the implementation of the Programme's four management objectives that, when taken together, achieve the Programme Purpose. These four objectives are:

MO 1. Community benefits from conservation are enhanced
MO 2. Conservation education and awareness enhanced
MO 3. Human-Wildlife Conflict is reduced
MO 4. Holistic livestock and grasslands management promoted

[55] Wildlife Conservation and Management Act, 2013, Section 7(n)

The following sections describe these management objectives and the corresponding management actions needed to achieve them. Under each management objective and action, a rationale and a description of how the objective or action will be achieved is provided.

Management Objectives and Actions

Objective 1: Community benefits from conservation enhanced

Wildlife tourism combined with extensive livestock grazing should offer higher economic returns to land owners if they are to be convinced to continue supporting wildlife conservation on their land. Failure to ensure that land owners receive social and economic benefits that they value will result in loss of interest in conservation which could fuel land use changes to land uses that are incompatible with conservation.

This management objective has therefore been designed to achieve one of the future desired conditions at the GMME which is where land owners receive tangible benefits from conservation and they are strongly supporting biodiversity conservation in the GMME. The management actions that will be implemented to realize this objective focus on: establishing new conservancies and strengthening existing ones; supporting community social development projects; promoting non-tourism based income generating activities; negotiating long-term leases to cushion conservancies from unpredictable downturns in the tourism industry; developing carbon credit projects in the GMME; promoting creation of wildlife conservation easements; and sensitizing the community on the Masai Mara Community Support Fund. These actions are elaborated in the following sections.

Action 1.1: Establish new conservancies and strengthen existing ones

Conservancies have been an effective conservation tool for securing the diminishing space for wildlife and a source of community livelihood. They provide income to members through land lease payments by tourism partners and provide employment opportunities to community members as conservancy managers, rangers, and other support staff. Currently, the GMME has 16 functional conservancies, and there are five others at the nascent stage of establishment (Figure 19). However, the sustainability of these conservancies, which are very dependent on tourism, in the wake of COVID-19 is bleak given the low visitation numbers recorded in the ecosystem and the country in general. To ensure that conservancies remain a vital conservation tool for securing wildlife dispersal areas and corridors in the GMME and that they continue supporting sustainable community livelihoods, stakeholders will mobilise the GMME community in wildlife-rich areas to establish new conservancies. The new conservancies will also be supported in their official registration process. To ensure enhanced capacity in conservancy leadership and governance, conservancies management will be trained in governance, leadership, and communication. They will also be supported to develop and implement legal structures and policies to ensure transparency and accountability. In addition, a conflict resolution mechanism for mediation of conflicts in conservancies will be developed and adopted by conservancies. MMWCA will

also lobby the government to make the ongoing ranger-support stimulus package a long-term project.

In addition, CGN in collaboration with other partners will provide technical and material support to facilitate establishment of new conservancies and strengthening the existing ones. Stakeholders will also collaborate in establishing a funding mechanism that will support conservancy projects through grants and micro-loans. All conservancies will also be supported in developing and gazetting their management plans in accordance with the Wildlife Conservation and Management Act, 2013.

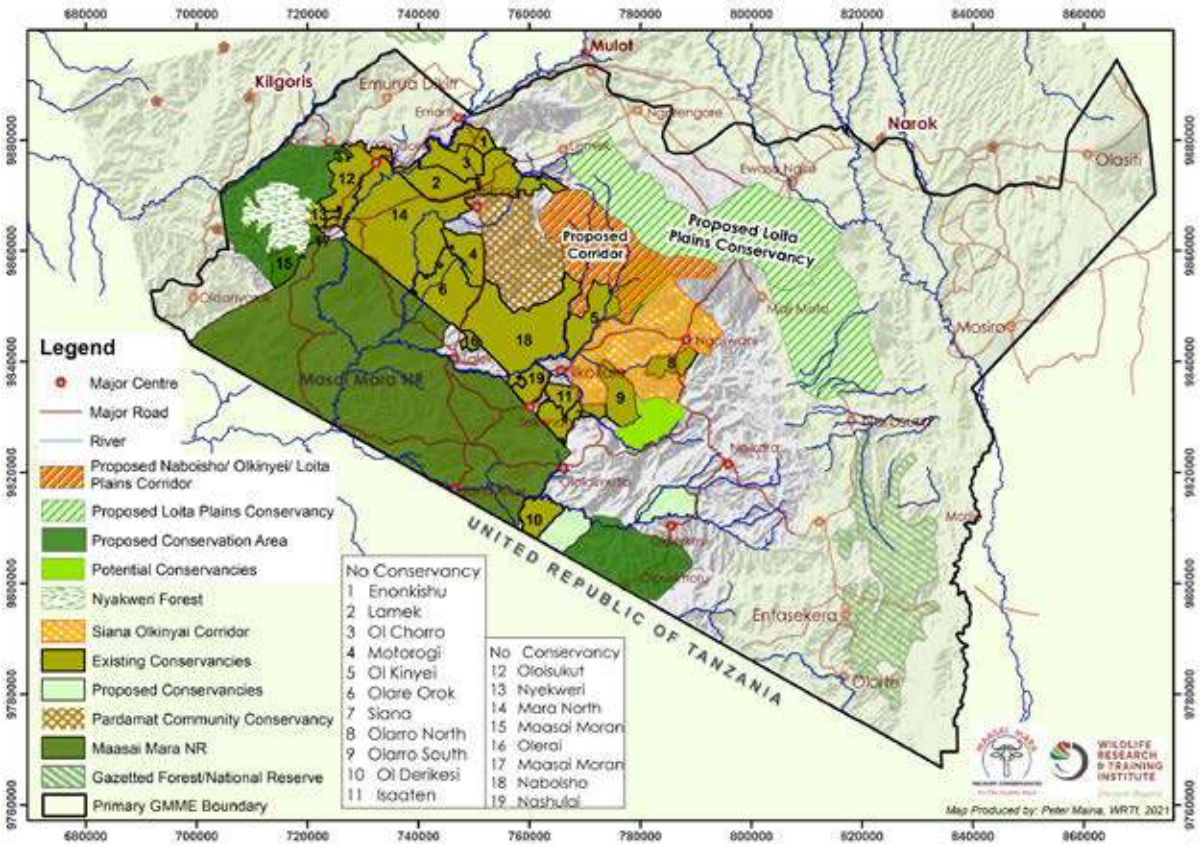

Figure 19. Existing and proposed conservancies in the GMME

Action 1.2: Support community social development projects

To ensure that communities in the GMME are receiving tangible benefits from conservation, GMME stakeholders have been supporting diverse social development projects. These include the construction of health centres, classrooms, roads, and water supply systems.

Stakeholders will continue mobilizing funds to support social development projects identified by the community in a participatory manner. These will include health, education, water and sanitation and re-afforestation and agroforestry projects, all of which enhance community adaptation to climate change impacts. To ensure that social projects are evenly spread across the ecosystem, MMWCA and its partners will identify community development needs of different conservancies and consolidate them into a report that will guide the implementation of new projects. Since these projects will be conservation-linked, as much as possible, they will be evaluated to discern their effectiveness in improving community support for conservation.

To further increase benefits to the local community, CGN will ensure and enforce that the facilities in the ecosystem have 70% of their staff who are locals and further ensure that human resource available are well capacitated and strengthened.

Action 1.3: Promote non-tourism-based income generating activities

To ease pressure on land, there is a need to diversify community livelihoods. While MMWCA is supporting women groups to establish beekeeping projects, the production of bee products is not at a commercial scale. This is partly because of a lack of credit and skills to add value to bee products. MMWCA is also supporting a cooperative society to promote enterprise projects initiated by women groups. To diversify community livelihoods, stakeholders will help the community in identifying and developing natural resource-based enterprises. Regarding this, assistance in development of viable business and action plans for priority initiatives will be provided. An enterprise-related cooperative society with strong governance mechanisms will be established to support members in producing and marketing their products. To ensure that the community enterprises have the requisite capital to start and successfully operate their enterprises, seed funding will be provided to cooperative members to begin their projects. To grow their enterprises, the community will be supported to access small grants and micro-loans from partners and micro-finance institutions, respectively. Moreover, to ensure that the community has the requisite skills to operate successful enterprises, members of different community enterprise groups will be trained in financial management skills.

Action 1.4: Negotiate long-term leases to cushion conservancies from unpredictable downturns in the tourism industry

Downturns in the tourism industry and consequent low returns from land leases are a demotivation to landowners and can catalyse the conversion of conservancies to other alternative land uses, such as agricultural development. Consequently, conservancy members must be adequately compensated for the opportunity cost of setting aside their land for wildlife conservation and tourism to prevent them from opting for alternative land uses. To ensure that conservancy members receive competitive returns, despite downturns in the tourism industry, MMWCA and its partners will establish the status of leases in all the conservancies and support conservancies to sign long-term lease agreements to cushion conservancies from unpredictable changes in the tourism industry. Lease structures that can attract and secure long-term tourism partners committed to guaranteed leases will be negotiated.

Action 1.5: Develop carbon credit projects in the GMME

Climate change is one of the most critical threats to humanity, and it will increasingly challenge the way development is managed. Stabilising the climate system demands mitigation and adaptation measures to reduce climate change impacts and increase the resilience of essential ecosystem services[56]. One of the tools used to reduce the destruction of forests and woodlands is the sale of carbon credits in environmental markets (e.g. CO_2 emissions, water) by community-based projects. This can apply to GMME as its two forests, Loita and Nyekweri, are under increasing anthropogenic threats. Reduction of these threats could be addressed through establishing carbon credit projects in the two forest areas. Therefore, MMWCA will work with partners in developing a carbon credit project concept. Thereafter, carbon stock assessments at Loita and Nyekweri will be conducted. Community sensitization meetings will be held to gain community support for the carbon credit projects.

[56] IUCN (2021). Manual for the creation of Blue Carbon projects in Europe and the Mediterranean. Otero, M. (Ed)., 144 pages.

In addition, community study tours to some of the success stories[57] of carbon credit in the country will be conducted to motivate community participation in the carbon credit projects. Concurrent to these activities, carbon credit markets will be sought in collaboration with carbon credit industry players.

Action 1.6: Promote creation of wildlife conservation easements

Section 65 (1) of WCMA, 2013 provides that wildlife conservation easements may be created by voluntary private arrangement or upon appropriate application to the Environment and Land Court. Wildlife conservation order or easement may be created to "create or maintain migration corridors and dispersal areas for wildlife."[58] Therefore, stakeholders within the GMME will use this provision to establish wildlife conservation easements to secure critical wildlife corridors and dispersal areas. As a prerequisite to this, all areas outside the conservancies and MMNR, but within the GMME, will be mapped and all migratory routes and corridors and any features of conservation interest in these areas identified and mapped. In addition, land use in these unprotected areas will be assessed and categorised according to its compatibility or incompatibility with conservation. Thereafter, landowners along the identified wildlife corridors will be sensitized on establishing conservation easements including the obligations of the landowner and the easement holder. As prescribed under Section 69 (1) of WCMA, 2013, appropriate compensation for any loss or diminishment of land value will be negotiated with the landowner.

Action 1.7: Sensitize the community on the Maasai Mara Community Support Fund

The County Government of Narok has established a funding mechanism, the Maasai Mara Community Support Fund, to provide a mechanism to finance sustainable conservation and economic development projects for the communities living around the Maasai Mara National Reserve in a bid to eradicate poverty, improve health standards, improve education standards, and improve the community's social welfare. The sources of the Fund include the 19% of revenue collected by the County Government from Reserve Entrance Fees, donations, grants, other gifts made to the Fund, and monies from any other sources as appropriated by the Narok County Assembly.

Community support benefits will be implemented in accordance with the Maasai Mara Community Support Fund Act (MMCSFA), 2016. The First Schedule of the MMCSFA, 2016 provides for public participation in the design and implementation of community projects. Since the Fund can significantly address the needs of the local community, CGN will work with stakeholders to sensitize the community on the purpose of the Fund and how funds are allocated. The community, through their leaders, will also be encouraged to participate in the identification and implementation of projects at the ward level.

Objective 2: Conservation education and awareness enhanced

Conservation education and awareness creation among the local community are critical tools for cultivating a strong conservation constituency. Such a constituency is vital in combating the many conservation challenges facing the GMME. A conservation aware community can be very accommodative of wildlife despite the negative human-wildlife interactions that it experiences.

[57] e.g. the 80,000-acre Rukinga forest reserve in southeastern, Kenya.
[58] Section 65(4c) of WCMA, 2013.

The future desired state for the GMME in respect to conservation education and awareness is where the community is aware of the importance of the GMME's conservation values and it is supporting conservation efforts. The management actions that will be implemented to achieve this objective focus on: training community members in tertiary institutions; training community members in environmental conservation and tourism through workshops, seminars and short courses; and creating awareness on conservation activities in the GMME among the local community and the general public. These actions are elaborated in the following sections.

Action 2.1: Support training of community members in tertiary institutions

The desired future state for the GMME is one where the ecosystem is valued and supported by the local communities to ensure that it becomes a viable wildlife conservation area in the long term. This aligns with the KWS Strategic Plan 2019-2024 and the National Wildlife Conservation Strategy 2030, which emphasize improving literacy levels amongst communities living adjacent to conservation areas in Kenya. It is widely acknowledged that low literacy levels and poverty are two intertwined socio-economic challenges facing wildlife conservation. These challenges influence poaching, human-wildlife conflicts, and other associated wildlife crimes. Strengthening the literacy levels amongst the communities within the GMME is thus expected to inspire optimism, promote conservation education and awareness, and provide a critical pool of future conservation leaders in the area and a locally available workforce to support conservation and tourism. Currently, MMWCA supports vocational training focusing on hospitality and artisans in tandem with their conservation objectives. Moreover, other stakeholders, such as the County Government of Narok (CGN) and the National Government provide bursaries to needy students while conservancies award bursaries to all landowners. To sustain the programme, funding support will be solicited from other development partners pursuing the same goals. Presently, many development partners, such as Equity Bank - Wings to Fly, the Kenya Commercial Bank, and the Cooperative Bank, among others, are supporting brilliant but disadvantaged students. However, these noble efforts are fragmented and need consolidation through a structured framework. To facilitate such a framework, stakeholders will do the following: identify and profile bright and needy students for enlisting in sponsorship programmes; enlist corporate support for these students from communities adjacent to conservation areas within the GMME; and create a framework or platform for support partners to periodically meet and share data while exploring how such support to students can be enhanced as an indirect support to the conservation sector within the GMME.

Action 2.2: Train community members in environmental conservation and tourism through workshops, seminars and short courses

Generally, education programmes in the conservation sector focus on creating awareness and appreciation and confer direct and indirect benefits to the communities living adjacent to conservation areas. Education programmes and activities at GMME involve giving environmental talks and video shows at local schools, trading centres, and public barazas. Public meetings organised by the local administration and environmental awareness events are also used to disseminate information on wildlife conservation. Despite these efforts, there has been minimal success in gaining broad community support for the GMME and improved governance at the conservancies, a new model for managing wildlife resources. This is evidenced by the frequent schisms, human-wildlife conflicts, poor governance of conservancies, and poor management of tourist facilities which negatively impact the conservation and tourism efforts in the area. Moreover, the conflicts stemming from governance are partly due to the inability of some landowners to support and join the conservancy movement and their cooperative arrangements.

To create, enhance, and maintain conservation awareness at the GMME, gain support for conservation education, and improve conservancy management, GMME Conservation Education Programme will be revamped and deliberately re-designed to target landowners, conservancy management committees, local opinion leaders, and community rangers. The programme will also target formal leaders in the civil service, chiefs, DCC, and administrators. These community groups will be reached through workshops, seminars, and sponsored education trips to areas undertaking wildlife management with similar conservancy models.

Currently, the Ministry of Tourism and Wildlife and the UNDP are implementing the Illegal Wildlife Trafficking (IWT) project to combat poaching and illegal trafficking of wildlife products in conjunction with other responsible parties, such as KWS, CGN, and MMWCA. The overarching objective of this conservation action is to create awareness in affected communities about wildlife conservation, illegal wildlife poaching and trafficking, as well as mitigation of HWCs. In this regard, the GMME education programme for communities will seek to: engage the project executants MoTW-UNDP to develop the terms of reference for the training of community scouts; develop programmes and funding for training of community members for improved governance of conservancies; develop and implement HWC training programmes that include mapping of conflict hotspots, compensation procedures, data recording, and Problem Animal Control (PAC); integrate conservancy game scouts in the detection and reporting of problem animal incidents to manage HWC; and engage the local communities and other stakeholders in participatory planning and implementation of the conservation activities within the GMME.

Action 2.3: Create awareness on conservation activities in the GMME among the local community and the general public

The mass media[59] plays an important role in conveying conservation education messages to the local community and the public. Therefore, to ensure that the public is aware of the benefits of the GMME and challenges facing it, mass media will be used to communicate the Mara stories. In addition, the plan implementers will partner in organizing and participating in conservation-related activities and events, such as the Mara Day, World Wildlife Day, World Environment Day, World Wetlands Day, among others. During these events, the community will be enlightened on the GMME's outstanding values and issues and challenges facing their conservation. In addition, plan implementers will ensure that their annual reports and the status of conservation reports are shared widely with stakeholders.

Objective 3: Human-Wildlife Conflict reduced

The future desired state that GMME stakeholders are aspiring for is where human-wildlife conflicts are minimised to improve human safety and community livelihoods. Currently human-wildlife conflicts are manifested in form of livestock predation, crop destruction, and human injury and even death. The main problem animals responsible for livestock predation are hyena, leopard and lion, while elephants are responsible for most of the crop raiding incidents. To reduce human wildlife conflicts in the GMME, the following management actions will be implemented:

Action 3.1: Build the capacity of KWS staff, community rangers, and community members in conflict mitigation

[59] television, movies, advertising, radio, the internet, magazines, and newspapers

Human-wildlife conflicts can be reduced significantly if relevant stakeholders have the requisite skills to prevent or promptly address HWC incidents when they occur. To build the capacity of stakeholders in addressing HWC, stakeholders will collaborate in training staff from different institutions in HWC mitigation measures and technologies. The HWC response teams will be equipped with suitable tools (arms, torches, camping gear, transport, phones, and airtime) and equipment to address HWC effectively. The Community Wildlife Conservation Committee (CWCC) will be empowered to actively participate in HWC mitigation and conservation issues. The four CWCC members selected by the community will be facilitated to attend crucial activities, such as CWCC meetings and verify the accuracy of compensation claims. This will help the KWS Warden prepare accurate periodic reports on HWC that are later used for national hotspot mapping and organizing the national status of HWC biennially as required by WCMA, 2013. To make this reporting more efficient, a HWC Information Management reporting system will be developed.

In addition, KWS and stakeholders will work with the local administration to conduct HWC mitigation barazas in identified hotspot areas. Feedback from these barazas will inform the location of outposts, the deployment of rangers, and equipment. KWS will also work with other stakeholders (MEP, WWF, CGN, Police) to mitigate HWC.[60]

Action 3.2: Promote predator-proof Bomas

Livestock predation is common in areas adjacent to the national reserve and the conservancies. It is also very common in intermediate areas between the conservancies. A few cases have, however, been recorded in communal lands and these have been attributed to male dispersing lions and hyenas.[61] Overall, hyenas were responsible for most of the reported livestock predation cases between 2009 and 2019, followed by leopards and lions (Figure 2).

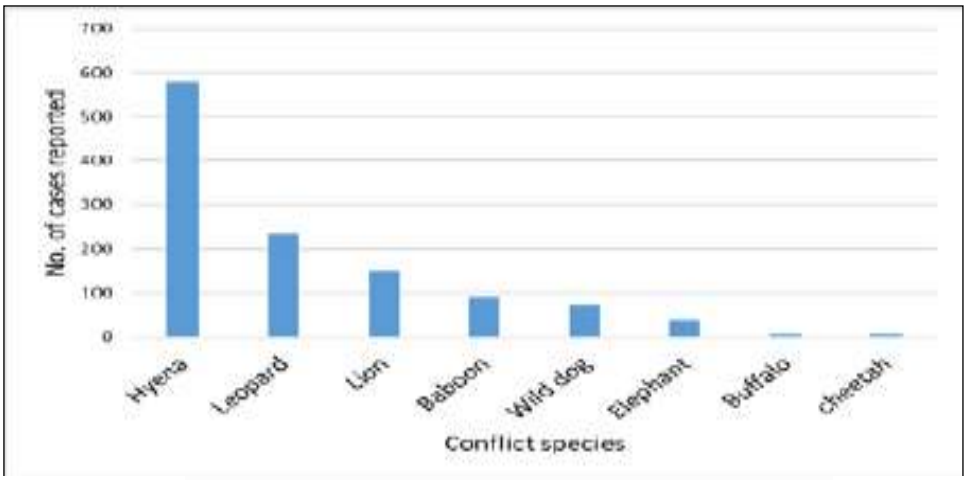

Figure 20. Livestock killing by wildlife in Narok County

To minimise human-predator conflict and subsequently reduce losses to the local communities, KWS and its partners have been implementing several measures aimed at preventing predators from attacking livestock. For instance, Mara Predator Conservation Project (MPCP) has installed 58 predator-proof bomas in the identified conflict

[60] The NPS are involved in the compensation process, particularly in death and injury cases; MEP conducts aerial reconnaissance in HWC hotspots and conducts elephant drives from farms; MEP and SWT support the KWS Vet Unit in rescuing (abandoned baby elephants for adoption or reunion with their herds) and treating injured. MEP also assists victims of wildlife injury by taking them to medical facilities.

[61] Ndambuki, S. & Matheka, S. 2020. Report on Human Wildlife Conflict 2010-2019 in Narok County

hotspots.[62] KWS, on its part, is installing 1000 predator-deterrent lights in the GMME's conflict hotspots. To ensure that livestock predation is further reduced, KWS and stakeholders will continue with the installation of predator-proof Bomas and deterrent lights during the lifespan of this plan.

Action 3.3: Establish wildlife barriers as appropriate

Currently, the ecosystem has few wildlife fences. This could be attributed to few land-use conflicts in the main wildlife concentration area: MMNR and Conservancies. However, crop-raiding is rampant, particularly in the irrigation schemes, such as Mosiro and rainfed farming areas in Trans Mara and around the Loita Forest. The main crop-raiding animals are elephants, followed by baboons, zebras, and buffaloes, in that order (Figure 24). To keep out crop-raiding wildlife from farms, wildlife-proof fences will be installed. However, a more detailed fence installation plan will be developed for the entire ecosystem before the installation commences. The plan will identify the crop-raiding hotspots and the most effective interventions needed to reduce conflict at each hotspot. A fencing technical committee will also be established to advise on fence installation and maintenance. In addition, the existing fence at Munyas will be evaluated to understand the underlying determinants of fence performance.

A preliminary identification of fencing needs is given in Table 2.

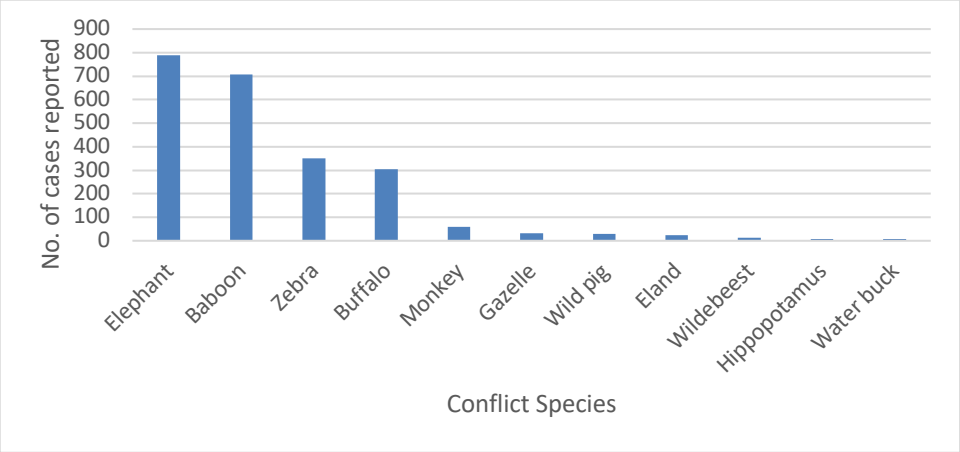

Figure 21. Crop raiding incidents and responsible animals from 2009-2019 in Narok County

Table 14. Proposed fence construction and rehabilitation in GMME

Fence location	Requirement
Munyas	Construct a fence of approximately 2.45 km to prevent elephants from crossing over to highly populated areas
Along the Mulot-Aitong road	construct a fence along Mulot-Aitong road to ensure elephants do not use the road as a corridor to the farms.
Munyas	Rehabilitate the fence constructed in 2004 around a sorghum plantation

[62] https://www.kenyawildlifetrust.org/recycled-plastic-pole-bomas/

Fence location	Requirement
Oloisukut-Olonkoliin	Construct a fence from Ntulele centre to Oloisukut Conservancy. The fence will block elephants from crossing the Mara River to Olonkoliin and Oloisukut maize farms
Mosiro	Construct a fence around Mosiro irrigation scheme

Action 3.4: Establish and maintain effective outposts in HWC hotspots and provide them with relevant resources

KWS is working closely with its partners to address human-wildlife conflict and wildlife security issues in the GMME. This collaboration has resulted in the effective deployment of resources to combat HWC incidents. To this end, KWS, Mara Elephant Project (MEP), and Narok County Natural Resources Network (NCNRN), working with SORALO, have established resourced ranger outposts at critical HWC hotspots (Figure 22). To further increase coverage of HWC hotspots, KWS will develop and equip three (3) additional outposts at Mosiro, Entasekera, and Olokurto, which is outside GMME but is still a crop-raiding hotspot. The Mara Elephant Project will establish and equip ranger's outposts at Munyas and Olonkoliin to mitigate conflict.

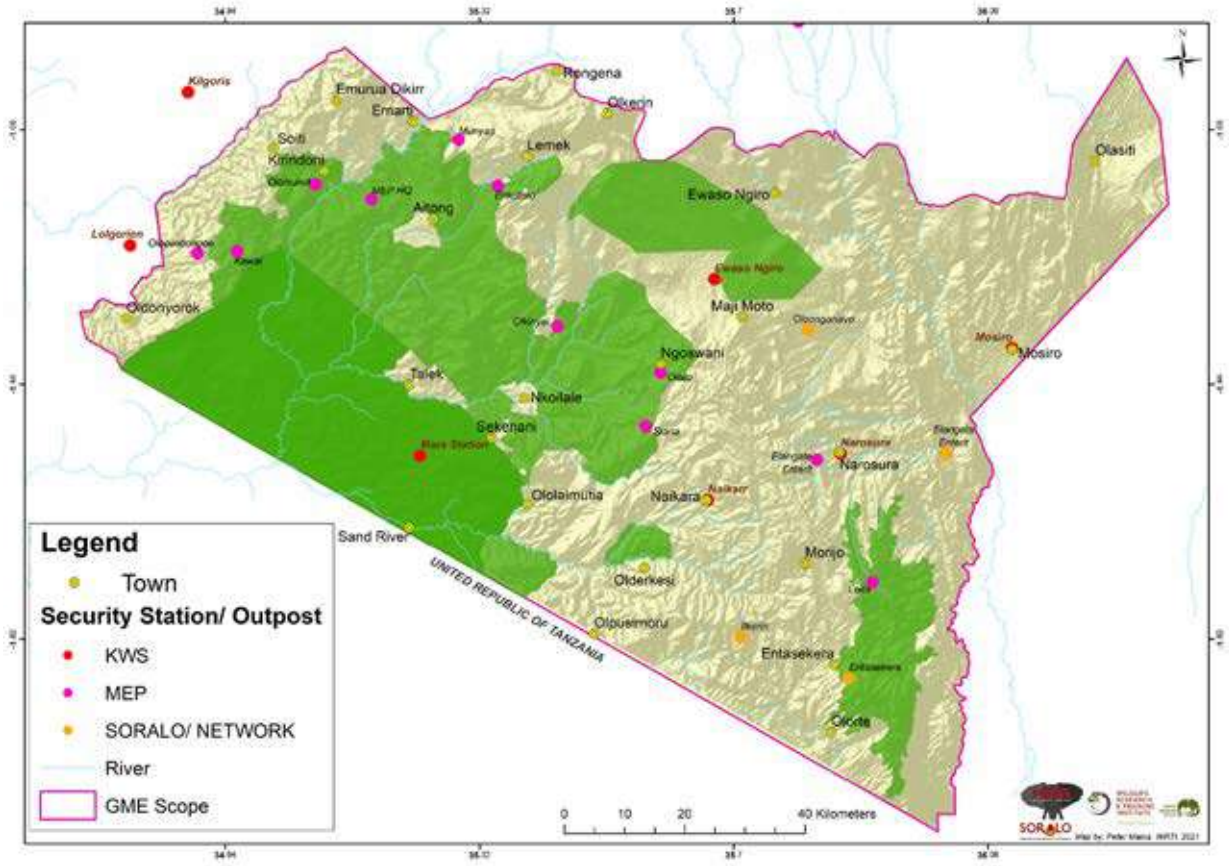

Figure 22. KWS, MEP, and NCNRN/SORALO outposts in the GMME

Action 3.5: Improve effectiveness of the wildlife compensation and consolation schemes

The WCMA, 2013, provides for compensation in case of loss occasioned by wildlife specified under the Third Schedule. However, despite this provision, compensation is only done for

human injury and death cases. Filed and processed crop damage cases are yet to be compensated. Lack of compensation and delays due to the lengthy process have resulted in community disillusionment with the wildlife compensation scheme. Therefore, to reverse this, GMME stakeholders will support the Community Wildlife Conservation Committee (CWCC) to convene wildlife compensation meetings as scheduled to ensure that there is no backlog of compensation claims. In addition, KWS will promptly disburse the upfront consolation funds to the deceased next of kin. Other stakeholders, including Mara Conservancy and Mara North, also have consolation schemes to compensate community members for livestock lost through predation. These consolation schemes will be maintained, and further efforts will be made to encourage other stakeholders to establish such projects to ensure that livelihoods are safeguarded while predators are protected from retaliatory killing and poisoning.

Action 3.6: Work with partners in maintaining a comprehensive HWC database at KWS Narok Station

KWS maintains a county-wide HWC database at its Narok Station. Information on HWC incidents is transmitted to the Station daily by its sub-station at Kilgoris, and the ranger outposts spread out in the HWC hotspots in the County. However, there are gaps in the data received at the Narok station since some incidents are only reported to the KWS Headquarters. This creates differences between information held at the Station and the one at headquarters. Moreover, some HWC incidents are reported to partners who respond to them but do not share information with the KWS Narok Station. To address this issue, KWS and its partners will standardise and harmonise HWC data collection and the reporting system by developing HWC protocols that will be implemented by all stakeholders that address HWC. Citizen Science will also be used to collect HWC information through a user-friendly mobile phone application that will be developed for this purpose.

Action 3.7: Explore different problem animal mitigation tools

GMME stakeholders will apply different methods of mitigating HWC. For instance, problem animals will be collared and closely monitored to detect when they are close to HWC hotspots, and prompt action is taken before they cause any harm. Persistent problem animals will be identified and then captured and translocated to other ecosystems where they are unlikely to cause conflicts. In addition, innovative technology will be used to reduce HWC. As part of rapid response and long-term monitoring and research, innovative technologies will include real-time satellite tracking and geo-fencing to control potential problem animals. Other mitigation measures, such as the use of drones, bees, chilli, chilli bombs, detusking elephants, wildlife drives, and scaring, will also be explored. The growing of alternative crops that crop-raiding elephants might not prefer will be explored. Such crops could include chilli, lavender, sunflower, tree tomatoes, garlic, and lemongrass. Once promising mitigation measures are identified from trials, the community will be trained on their application.

Action 3.8: Work with partners to develop and implement SAFE system approach

The SAFE System approach considers four elements of safety that managers and planners should pay attention to in order to help reduce the conflict to the optimum extent. Human-Wildlife Conflict Safe Systems is a suite of actions across six elements: Policy, Prevention, Mitigation, Response, Understanding the conflict, and Monitoring. They all contribute to a single long-term goal for an area: to make it safe - SAFE for People, Wildlife, Assets, and Habitat.

The Human-Wildlife Conflict Safe Systems strategy for GMME will have five basic elements. These include: empowering the community to effectively participate in wildlife conservation

and management; protecting wildlife and ensuring that it is not causing conflicts; promoting farming systems that are compatible with wildlife conservation; protecting wildlife habitats through a legally anchored spatial plan; and mapping HWC hotspots, monitoring community attitudes and measuring the performance of interventions.

Objective 4: Holistic livestock and grasslands management promoted

The future desired state at the GMME is where livestock remains a significant source of community livelihoods. Livestock plays a big role in the life of the community. It is a cultural practice and a key component in the socioeconomic growth of the community. Livestock production is mainly through an extensive livestock grazing system which faces various challenges, including land degradation due to overgrazing, poor quality livestock breeds, overstocking of shoats, poor market access, lack of grazing plans, and poor livestock husbandry. Therefore, this objective has been designed to address these challenges and contribute to achieving the programme's purpose. The management actions that will be implemented under this objective are elaborated in the following sections.

Action 4.1: Promote climate resilient livestock feeding strategies

To avert land degradation wrought by overstocking and overgrazing, it is necessary to institute measures that prevent haphazard grazing. Therefore, to improve livestock pastures and thus create quality habitat for wildlife, there is a need to develop livestock grazing plans for conservancies and communal grazing areas outside these conservancies. Outside the conservancies, livestock grazing is still communal even though the land is privately owned. For this reason, it is not only prone to *"the tragedy of the commons,"* but the risk of disease transmission is high in these areas, where traditional cattle are kept. A lot of livestock is also lost in these areas when drought occurs.

Under this management action, therefore, conservancies and stakeholders will ensure that all conservancies have community-agreed grazing plans to control livestock grazing. The grazing plans will be prepared in the context of the broader conservancy management plans. To ensure that these grazing plans are a success, strong grazing governance structures will be put in place for new conservancies, and in the case of existing ones, they will be strengthened. In addition, forage crops production, livestock feed conservation, processing and value addition and animal feeds trade will be promoted to cushion pastoralists during extreme droughts and generate income. Moreover, adequate water sources will be developed as appropriate. The conservancies will also keep livestock following the determined carrying capacity of the conservancy.

In the livestock grazing areas outside the conservancies (e.g. Loita-Mosiro Area), traditional grazing systems governed by customary norms will be promoted to control livestock grazing patterns. Sustainable grazing plans for these areas will be developed and sustainable stocking rates determined considering wildlife grazing needs. Further, a forage monitoring system will be established to track changes in forage availability and disseminate forage availability information to livestock keepers in a timely fashion.

Action 4.2: Promote adoption of improved and adapted livestock breeds

The livestock-dependent livelihoods of the local community can be improved if the low-yielding traditional livestock is cross-bred with high-yielding breeds. Currently, there are several livestock breeding programmes in the GMME. These include the Oloisukut Livestock Enterprise Strategy funded by WWF; the Mara North and Enoonkishu Conservancies that

are cross-breeding the local livestock with Borana cattle as the latter is resistant to drought and diseases and gives high beef yield; and the Ilkerin Integrated Development Project that produces both cattle and shoats.

To increase income from livestock products, the traditional livestock will be cross-bred with breeds with the desired traits, such as high meat yield or high milk yield. In regard to this, livestock breeds suitable for different areas in the GMME will be identified. Thereafter, quality climate-resilient bulls and rams will be provided to community members, through their organized groups, to cross-breed their traditional livestock. In addition, Artificial Insemination (AI) will also be used to cross-breed the traditional livestock to produce a high meat or high milk yielding progeny. To ensure the breeding programme is a success, stakeholders will work with the CGN Department of Livestock in training local Para-vets in animal health care. The Para-vets will be based within the community and attend to sick animals and provide AI services as required. These Para-vets will be supported with the equipment they need to accomplish their work effectively.

Action 4.3: Control and manage livestock pests and diseases

Livestock diseases, such as ECF, CBPP, and FMD are common in community areas and can cause significant losses to livestock owners. However, impacts of these diseases can be reduced by improving livestock husbandry practices, such as dipping on schedule and vaccinating livestock as appropriate. To ensure that transmission of livestock pests and diseases among local livestock is controlled, livestock husbandry protocols specifying the dos and don'ts to avoid disease and pest transmission will be prepared in a participatory process involving all community members. All community members in a given grazing zone will be required to endorse and adhere to these protocols. In addition, to control preventable livestock diseases, the CGN Livestock Department will conduct disease surveillance, support vaccination campaigns, and provide critical veterinary supplies when needed.

Action 4.4: Support livestock trade and value addition

To improve community livelihoods, livestock enterprises will be established. The purpose of these enterprises is to increase financial returns from livestock through improved livestock husbandry and marketing. Such enterprises can also encourage livestock owners to improve livestock quality rather than increase livestock numbers. Reduced livestock numbers in the range reduces pressure on pasture and pre-empts land degradation.

Lack of readily accessible markets and low-quality livestock product are major constraints in livestock production. Therefore, to address these constraints and by so doing enhance livestock production and marketing, CGN will: support marketing projects; construct and maintain sale yards; facilitate value addition services; and facilitate federation of organized producer organizations.

In addition, well-designed and professionally operated livestock enterprises can produce quality livestock products that attract different market segments. Such enterprises can produce non-high value products for the local market and high-value products for the international market. For this reason, livestock enterprises and associated businesses will be established through professionally developed business plans that clearly define the production and marketing of livestock products. The livestock enterprise will include the production of livestock feeds, construction of abattoirs, a skin and hide processing factory, and milk cooling and processing plants. Further, to improve beef quality and increase returns from cattle, cattle fattening programmes will be implemented in the conservancies and neighbouring areas within the context of conservation.

Objective 5: Climate smart agriculture in agropastoralism areas is promoted

In the last 20-30 years, climate change has affected Narok County, with rainfall seasons becoming more unpredictable. These changing weather patterns have a negative impact on livelihoods and food security, especially of the rural community in the semi-arid rangeland areas of the county, such as the GMME, that are most vulnerable to the shifting rainfall patterns induced by climate change. The GMME includes an agropastoralism zone that is dominated by rainfed farming in the north (Lemek-Maji moto), west (Trans Mara) and east (Entasekera area), and irrigated farming in the east (Narosura and Mosiro). However, extended dry spells and droughts negatively affect crops leading to frequent crop failure in the rain-fed agriculture areas.

The future desired state that this objective has been designed to achieve is, therefore, where the GMME agropastoralist community adopts more sustainable and climate-smart production systems making it food secure under climate change. This will be achieved through implementation of the following management actions: support the adoption of Climate Smart Agriculture (CSA); support production of high nutrient food types; promote implementation of good agricultural and sustainable land management practices; promote conservation, processing and value addition of food commodities; support access to appropriate and high-quality farm inputs; and promote adoption of integrated pest management regimes. These actions are elaborated in the following sections.

Action 5.1: Support the adoption of Climate Smart Agriculture (CSA)

Climate-Smart Agriculture (CSA) is agriculture that sustainably increases agricultural productivity and incomes; builds resilience and adaptation to the impacts of climate change; and contributes to climate change mitigation, where possible. It strengthens food security and delivers environmental benefits. It is a three-tiered approach that promotes the adoption of climate-smart practices, supports existing production systems in adapting to the impacts of climate change, and fosters an enabling environment for conducive policies, institutions and finance[63].

To mitigate impacts of climate change in the agropastoralism areas in the GMME, the County Government of Narok, through its Department of Agriculture, will work with other stakeholders in promoting Climate Smart Agriculture. Towards this, the Department of Agriculture will work with the National Drought Management Authority (NDMA) and the Kenya Meteorological Department (KMD) in ensuring timely dissemination of information on early warning weather predictions to farmers so that they can make appropriate decisions on crop production and avoid weather-related crop failure. In addition, to cascade weather information to farmers, the Department will acquire climate smart agriculture tools and equipment and train farmers on their use. It will also train farmers, through extension services, on climate smart agriculture and growing of crop varieties adapted to drought.

Action 5.2: Support production of high nutrient food types

To improve food and nutrition security, which is blamed for poor nutrition, stunting and wasting of children under five years, the Department will build the capacity of the agro-pastoralists in production of high nutrient food types. This will be done by conducting demonstrations on production and use of different nutritious food crops that are adapted and

[63] FAO. 2019. Operational guidelines for the design, implementation and harmonization of monitoring and evaluation systems for climate-smart agriculture. Rome, FAO.

suitable to semi-arid areas, such as early-maturing and drought-resistant crops. In addition, fish farming, beekeeping, and poultry production will be promoted to diversify livelihoods and improve nutrition among the agro-pastoralist community.

Action 5.3: Promote implementation of good agricultural and sustainable land management practices

The cultivated areas face several challenges that decrease their productivity. These include soil erosion, mainly through farm runoff, which reduces soil fertility leading to low farm yields. Consequently, rainwater harvesting to control soil erosion and use the water for domestic use and irrigation, will be promoted. In addition, Conservation Agriculture principles will be promoted as a tool for controlling soil erosion, retaining soil moisture and increasing crop production. Towards this, extension services on Conservation Agriculture will be enhanced to increase its uptake among farmers. Further, farmers will be provided with technical and financial support in sourcing soil and water conservation tools and equipment, and in installing soil and water conservation structures. Agricultural demonstrations will also be conducted on Conservation Agriculture models to educate farmers. And for the resource poor, CGN and partners will acquire and distribute rain water harvesting and water storage facilities to farmers to enhance rain water harvesting.

Action 5.4: Promote conservation, processing and value addition of food commodities

Value-addition activities, meant to prolong the shelf lives of perishable crops, are inadequate in Narok County. For example, perishable crops like tomatoes and potatoes usually go bad during transportation. Farmers record post-production losses of over 25% due to poor handling and inadequate storage facilities. Poorly developed marketing and promotion systems also contribute to post-production losses. Furthermore, the high cost of transportation affects farmers. Since farmers need to reach markets quickly, inadequate access to market facilities worsens the situation. Moreover, bad roads, coupled with sporadic rainfall, often negatively affect maize, tomato, and Irish potatoes. To minimise losses from post-harvest handling of crop produce, farmers will be supported with critical post-harvest and value addition technologies. Business to business fora to improve off take will also be conducted and farmers trained in post-harvest storage of different crops as well as value addition.

Action 5.5: Support access to appropriate and high-quality farm inputs

Expensive inputs are a major hindrance to Narok County's agriculture. Inorganic fertilizers and reliable improved seed varieties, are some of the important inputs in Narok County. However, they are expensive and inaccessible. This means that farmers often do not have these inputs at the beginning of the planting seasons. This, coupled with other factors, often leads to low productivity. To address this problem, the County Department of Agriculture will conduct market research, acquire and distribute high-quality farm inputs for high value crop varieties. It will also conduct demonstrations on the application of the farm inputs.

Action 5.6: Promote adoption of Integrated Pest Management (IPM) regimes

IPM focuses on the long-term prevention of pests or their damage through multiple techniques, such as biological control, habitat manipulation, modification of cultural practices, and the use of resistant varieties. Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made to remove only the target organism.

The use of alternative pest management practices by farmers can go a long way in not only reducing cost of production due to reduced expenditure on pesticides, but also contribute to

environmental conservation through reduction in soil and water pollution. To minimise pesticide use in the GMME's crop farming areas, IPM will be promoted. To achieve this action, CGN's Department of Agriculture will use its Agricultural Extension Officers to promote IPM among farmers. This will be done mainly through Farmer Field Schools, workshops for organised groups of farmers, and radio and TV talks.

INSTITUTIONAL COLLABORATION AND GOVERNANCE PROGRAMME

Programme Goal and Guiding Principles

Programme goal

The goal of the Institutional Collaboration and Governance Programme is:

To strengthen capacity, representativeness and collaboration among locally-led institutions to deliver targeted conservation and development actions in the GMME

Guiding principles

Four strategic principles that will guide the implementation of the Institutional Collaboration and Governance Programme over the next 10 years and the achievement of the programme goal are set out below. Wherever appropriate, guidance has been drawn from relevant national and international laws, policies, plans and programmes.

Good governance best practices integrated in all GMME institutions

Good governance is a structure and system of rules, practices and processes by which an organization is directed, controlled and held accountable. It involves balancing the interests of the many stakeholders in an organization including donors, county and national governments, the environment and the community.

There are several instruments that guide good governance in the conservation of natural resources. The principles have a strong focus on including all stakeholders and a concern for equity. The principles are based on the United Nations Development Programme's list of the characteristics of good governance. The principles now referred to as "IUCN Principles of Good Governance for Protected Areas" are as follows:

- **Legitimacy and voice** – which means participation and consensus orientation
- **Direction** – That is having strategic vision, including human development and taking into account historical, cultural and social complexities
- **Performance** – This refers to the responsiveness of institutions and processes to stakeholders, and also their effectiveness and efficiency
- **Accountability** - Accountability to the public and to institutional stakeholders. Also, transparency in operations including sources of funding and beneficiaries
- **Fairness** – Equity, justice and the rule of law

Part of the key stakeholders in the Mara Ecosystem is the wildlife conservancies. There are good governance principles customized for community wildlife conservancies in Kenya, drawing from the IUCN Good Governance Principles and the Principles of Corporate Governance in the Commonwealth. These principles include constitution, registration, governance and management structure, guidelines on membership and benefit-sharing

mechanism. Hence, a guiding principle under this programme will be the integration of best governance practices in the institutions in the governance institutions of various aspects of the ecosystem.

GMME institutions are locally led

The concept of local leadership of institutions is supported by several policy and legal instruments. This is in line with the community participation principle which is embedded in several sectoral (Wildlife, Water, forests and fisheries) policies and legislations. Further, the Constitution of Kenya, 2010 provides for community-based management in Sections 69 (1) (a) and (d). Community-based management takes many different forms in different sectors and contexts. For instance, in water, local communities participate through Water Resource Users Associations (WRUA), in forests through the Community Forests Associations (CFA), in fisheries through Beach Management Units (BMU) and in wildlife through conservancies.

Principle 2 of the ecosystem approach states that management should be decentralized to the lowest appropriate level. Decentralized systems may lead to greater efficiency, effectiveness and equity. Management should involve all stakeholders and balance local interests with the wider public interest. The closer management is to the ecosystem, the greater the responsibility, ownership, accountability, participation, and use of local knowledge." Thus; to ensure that the conservation and development agenda in the ecosystem has full support of the local community, the local institutions will be led by the local community members.

Enhanced collaboration and collective action among institutions

Environmental Management and Coordination Act (EMCA), 1999 is a framework law providing for the legal and institutional framework for the environmental management. In the preamble, the Act recognizes that the environment is the foundation of the economic, social, cultural, and spiritual enrichment. It also acknowledges the diverse nature of natural resources and the need to have a framework of coordination of diverse sectoral initiatives to improve the national capacity for management of the environment.

Institutional collaboration is further supported by The Wildlife Conservation and Management Act, 2013. This Act provides for the involvement of different stakeholders including state agencies in coming up with planning and programmes in the conservation of wildlife. It also promotes ecosystem based planning and effective participation of the public in wildlife management.

In addition, Principle 7 of the CBD ecosystem approach guidelines Principle 7 provides that managing large areas may require the development of new institutional mechanisms to engage stakeholders across administrative borders and different levels of administration.

There are many institutions working in the Mara Ecosystem ranging from international NGOs and investment companies, government agencies and departments, local NGOs to community-based organisations. One major drawback in this diversity of institutions is the lack of close collaboration in their operations. This leads to overlap in mandate and resources and undermines effectiveness due to lack of follow up of many proposals and recommendations. Hence, in line with the above-mentioned laws and policies and to ensure synergy, the institutions working in the ecosystem will work towards a better collaborative framework for the effective delivery of the ecosystem's management objectives.

Gender is mainstreamed in all institutions, programs and actions

The COK 2010 has an extensive Bill of Rights which includes environmental rights, social, economic and cultural rights. Specifically, it disallows any discrimination of women and youth in participation in natural resources management and benefit sharing. For instance, conservancies working in the ecosystem should ensure that women and minors (for child-headed households) are not discriminated against and left out when establishing (or updating) the "register of members" of the community.

International instruments that support gender mainstreaming include:

- The Universal Declaration on Human Rights (UDHR) (1948)
- UN Declaration on the Rights of Indigenous Peoples (DECRIP)
- International Covenant on Economic, Social and Cultural Rights
- The International Labour Organization Convention No. 169
- The Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW)
- Sustainable Development Goals (SDGs) 2014

Therefore, GMME stakeholders will ensure that their programmes and projects are in line with the COK 2010 and the international obligations that Kenya is a party to.

These guiding principles are intended to guide the implementation of the Programme's two management objectives that, when taken together, achieve the Programme Purpose. These objectives are:

MO 1. Institutional capacity for ecosystem management strengthened
MO 2. Sustainable governance arrangements established and strengthened in the GMME's nonprotected areas

The following sections describe these management objectives and the corresponding management actions needed to achieve them. Under each management objective and action, a rationale and a description of how the objective or action will be achieved is provided.

Management Objectives and Actions

Objective 1: Institutional capacity for ecosystem management strengthened

The future desired state at the GMME is where different institutions working in the ecosystem are well networked to serve the ecosystem and the communities as a team through effective collaboration. Because of the rich resources and economic importance, the ecosystem continues to generate a lot of interest from stakeholders in natural resources management

and governance. There are also diverse interest groups dealing in pure research and advocacy in a specific component of the ecosystem.

The presence of many institutions is a positive thing as it means the resources in the ecosystem, which are of local and global interest, are well understood in terms of their conservation status. The main challenge experienced in the ecosystem is the presence of many stakeholder institutions who work independently of each other creating room for overlaps, negative competition and potential conflicts. This also undermines the effectiveness of their work as scarce resources are never utilized to the optimum for the benefit of the natural resources being conserved and the beneficiary communities.

The major gap, however, is caused by a lack of an effective collaborative mechanism. Several attempts have been made to create such a mechanism with varying degrees of success. This management plan recommends that these initiatives be strengthened to ensure the collaboration efforts bear fruit and ensure that the collaborations are formalized in a manner acceptable to stakeholders.

This objective will be achieved through the implementation of the following actions:

Action 1.1: Establish and gazette a Plan Implementation Committee (PIC)

The success of the GMME management plan is hinged on its implementation. Hence, given the different stakeholders owning the management plan, there is a need to have a committee constituted from the member institutions to preside over the implementation programme. Such a committee will draw membership from the immediate partners who own the plan and from supporting institutions that represent key sectors and government departments. The committee will be vested with powers to review development projects, arbitrate disputes and oversee the management plan on behalf of the stakeholders. For greater effectiveness, it will be institutionalised through gazettement. Clear terms of reference and a charter will be developed and agreed upon to guide its operations. The PIC will hold quarterly meetings to review progress in plan implementation and take corrective actions to ensure the plan is on track. The PIC will work through three sub committees: conservation and tourism committee, development committee, and resource mobilisation, monitoring, evaluation and learning committee.

A Plan Implementation Coordinator who will be responsible for organising committee meetings and monitoring plan implementation will also be recruited.

Action 1.2: Establish a wildlife security coordination hub

Wildlife is a key resource in the ecosystem and indeed the foundation of the ecosystem brand as the leading tourist destination in Africa. The ecosystem is also home to key species of great conservation interest because of their status and significance.

The National Government, through KWS, has is legally mandated to coordinate wildlife security in the country. At the GMME KWS is supported by key institutions like conservation NGOs, the MMNR management, and individual conservancies. Collaboration within these institutions is weak, making it difficult to share information and intelligence for timely action.

To improve stakeholder collaboration in wildlife security, KWS will work with stakeholders to establish a wildlife security hub. This hub will integrate telecommunication systems of conservation stakeholders to facilitate effective information sharing. Moreover, KWS will provide telecommunication equipment to wildlife security partners and train them on their

use. It will also develop wildlife security protocols on incident reporting and response among stakeholders and organise joint wildlife security operations.

To improve the effectiveness of Community Wildlife Scouts in providing wildlife security, KWS will support paramilitary training of the scouts and seek their designation as National Police Reserve. And to enhance stakeholder participation in wildlife security, a joint operations committee comprising wildlife security partners in the GMME will be established. This committee will be chaired by KWS and it will be meeting quarterly to review progress in wildlife security and design security strategies to deal with priority security issues.

Action 1.3: Establish a GMME Land Trust as a mechanism to keep land within the community

The viability and ultimate survival of the Mara Ecosystem rests in the survival of the Greater Mara as a conservation area complementing the reserve. The conservancies have played a significant role in this regard and their success should interest all stakeholders. However, majority of the conservancies are constituted of private land with freehold titles. Occasionally, land owners experience economic challenges or have different interests that motivate them to sell their land in search of income. Selling land potentially invites external investors who may have other land use ambitions outside conservation. This remains a potential threat to the ecosystem. Already there is the encroachment of agriculture from the northern side of the ecosystem near Enoonkishu Conservancy. There is also commercial encroachment from the western side, fuelled by the recent upgrading of the Narok-Sekenani Road. One way to prevent this threat is to have a consolidated fund that ensures all land available for sale is secured for conservation in the form of a land bank. This, however, will require an institution, GMME Land Trust, with community mandate and resources to do so. This will ensure that all land due for sale is acquired by the Land Trust as a matter of priority unless it is unable to do so. The land acquired by the Trust will be retained in the ecosystem for conservation of other supporting land uses like nucleated settlement, wildlife corridors, livestock grazing or just land bank. This intervention measure is expected to minimise land conversion to incompatible land uses inside and outside of conservancies, minimise fencing, and promote communal land use and management. Implementation of this action will require sensitization of the community on the GMME Land Trust; preparation of a deed trust outlining the objectives and constitution of the Trust; sensitizing the communities and especially land owners to support the work of the Trust and contact it first before disposing of any land; writing a concept and proposal for funding of the Land Trust; mobilize resources for the Land Trust to enable it to buy land at market rates to win cooperation from land owners; and enlisting the support of all stakeholders to ensure the Land Trust gets first priority in all land sales.

Action 1.4: Advocate for national and county government support to wildlife conservancies

The conservancies play an important role in supplementing government efforts in the conservation of wildlife. Most of them recruit community rangers to secure conservancies and wildlife and pay from their income, mainly from tourism operations. In the wake of the COVID-19 crisis that brought international tourism to its knees for close to 2 years, the Kenya government introduced a stimulus package to cushion some critical sectors of the economy. This included paying wages for community rangers working in the conservancies whose source of income was wiped out by the tourism crisis.

Even with the gradual resumption of tourism, it may take a while for the industry to recover profitability to the pre-COVID-19 period. Also, there are still many conservancies that do not have strong tourism enterprises to support the employment of rangers. There are also critical wildlife corridors outside protected areas (Reserve and Conservancies) that need to be

secured but do not have prospects for tourism development. Given the importance of the wildlife dispersal areas and corridors in supporting wildlife populations that in turn support a premier wildlife safari tourism, CGN, the National Government, and other partners will work closely to secure wildlife corridors and dispersal areas in the ecosystem through funding mechanisms, such as the County Conservation Fund and the National Conservation Trust Fund. However, to start with, GMME stakeholders will collaborate in making a case for the extension of the current National Government's support to existing conservancies.

Action 1.5: Promote actions to reduce costs of living with wildlife through a guaranteed minimum return

Human-wildlife conflict remains a gap in community acceptance of wildlife due to the heavy cost borne by the people for hosting wildlife on their land. There is a need for a stronger institutional collaboration in human-wildlife conflict mitigation by key stakeholders, such as KWS, CGN, the Conservancies and NGOs. There is also a need for a more innovative approach to ameliorating the cost of living with wildlife by, for instance, working out ways the land owners are guaranteed income from their land for hosting wildlife. This is a concept of guaranteed minimum return which has been implemented with cash crops like coffee and tea with varying degrees of success. A guaranteed minimum revenue on wildlife will bring much needed validity and credibility to wildlife and conservation as a land use that is beneficial to communities. In arriving at objective returns, the plan proposes the following: conduct a land valuation study; conduct a cost-benefit analysis of wildlife conservation and other alternative land uses per hectare; and prescribe the GMR and share with the government for validation. The analysis will consider existing incentives, such as conservancy consolation programs, access to a national wildlife compensation scheme, and benefits from the Masai Mara Community Trust Fund.

Action 1.6: Improve forest and water conservation through targeted support to forest conservation, Community Forest Association, and Water Resource Users Associations in the GMME

The Mara River remains a very critical component of the GMME, supporting many ecological processes that are crucial to the survival and economic value of the ecosystem. The river system however has faced many threats starting from the degradation of the catchment to pollution and poor use within the ecosystem, especially by the tourism partners.

The regulations on waste disposal and protection of the riparian land are not well enforced, while crossing points for migration are not well protected from visitor congestion and destruction. This calls for close collaboration in the management of Mara river system and all the main rivers in the ecosystem to stem degradation of the ecosystem value of the riverine habitats. Consequently, GMME stakeholders will work with the CFAs in the Mau Forest and WRUAs in the Mara River Basin to sustainably manage the forest and water resources. In this regard, stakeholders will: build organizational capacity for CFA and WRUAs in the ecosystem; support development and implementation of CFAs and WRUAs management plans; work with NEMA to conduct periodic inspections on waste disposal by hotels and lodges; enforce guidelines against water pollution in the entire river basin; liaise with KFS and CGN in raising awareness on the importance of the Mau Forest to the Mara Ecosystem; establish incentive projects to conserve Mau Forest by seeking income-generating opportunities from conservation of the forest (e.g. Carbon Credits).

Action 1.7: Support the Conservancy Managers' and public consultative forums

Collaboration between conservancies is a paramount requirement for the success of conservation outside the reserve. Conservancies share wildlife and even visitors, and it is therefore important they also share management ideas and harmonise some basic practices.

There are wildlife management and research activities that cut across the conservancies and many conservancies have a lot to learn from others. This led to the establishment of a conservancy managers forum where managers meet regularly to share experiences and learn from each other and from external guests. However, the forum remains informal and there is no mechanism to harness its potential as an important conservancy governance activity. There is a need to strengthen the forum and ensure the conservancies derive benefits from it in the interest of conservation and the ecosystem. In regard to this, CGN in collaboration with partners, will establish Community Wardens, Community Liaison Officers and Community Wildlife Scouts to liaise and offer linkages between the community and MMNR for better management of the ecosystem. Quarterly meetings for these officers, Conservancy Managers and Conservancy Community Liaison Officers, will also be supported.

In addition, to involve the general public in conservation and thereby gain support for conservation actions, such as securing wildlife corridors and dispersal areas, quarterly public forums will be held.

Action 1.8: Accord the GMME international recognition by listing it as a World Heritage Site and as a Man and Biosphere Reserve

An important ecosystem, such as GMME, faces survival challenges from many fronts. Listing it under different international classifications accords it more protection through various international collaboration instruments that enjoin national governments. There is therefore a need for collaboration to establish a trans-boundary World Heritage Site covering Mara and Serengeti. This will accord the ecosystem more international recognition and prestige while also committing the individual governments to more responsibility to ensure the survival of the ecosystem. Already Masai Mara NR is listed on the World Heritage Site (WHS) tentative list. The next step is to prepare a nomination justifying its inscription as a WHS. Hence under this action, CGN and KWS will lead the process of developing a nomination dossier which will be transmitted to the World Heritage Committee for consideration through the Kenya National Commission for UNESCO.

In addition, the conservation and development objectives that are being pursued at the GMME make it a candidate for designation as a UNESCO Man and Biosphere Reserve. Biosphere reserves are ecosystems that are internationally recognized within the framework of UNESCO's programme on Man and the Biosphere (MAB). They are nominated by governments to promote solutions to reconcile conservation and sustainable use. To have the GMME designated as UNESCO MAB reserve, plan implementers will collaborate with the Kenya National Commission for UNESCO to prepare and submit the relevant nomination documents to UNESCO.

Objective 2: Sustainable Governance arrangements established and strengthened in the GMME's nonprotected areas

The desired future for the Mara Ecosystem is where governance of natural resources is secured through strong and democratic management structures guided by international best practices. Many wildlife conservancies remain weak administratively because of the weak institutional framework that governs them. There have been various concerns regarding the legal establishment of conservancies and the constitution of leadership and benefit sharing mechanisms. When the institutions are not managed democratically, their social and legal

mandate remains weak and their legitimacy among the landowners wanes. The conservancies need to be encouraged and given capacity support to establish strong governance instruments that will give the conservancies a firm foundation to continue serving their important role of conservation and community empowerment.

The management actions that will be implemented to achieve this objective are elaborated in the following sections.

Action 2.1: Establish a network of community conserved areas on the Loita-Mosiro Ecoregion

This plan proposes to restore the lost historical Loita wildlife migration and wildebeest calving areas at Loita plains. To do this, the plan, under action 1.2 of the Natural Resource Conservation and Management Programme, proposes the establishment of two or more community conserved areas/conservancies and several wildlife corridors in the Loita-Mosiro ecoregion. Since this ecoregion faces unique challenges that need to be overcome to restore habitat connectivity that has been degraded by fences, there is a need to establish community conserved areas so that the challenges can be faced collectively. Under this action, therefore, MMWCA will spearhead the formation of community conserved areas, establish their governance and management structures, and assisted in the development and implementation of their management plans.

Action 2.2: Facilitate establishment of a conservation landscape level body to coordinate conservation action on the Loita-Mosiro area

To facilitate the establishment and implementation of community conserved areas established under action 2.1 of this programme, MMWCA will support the Loita-Mosiro ecoregion in establishing a community-based body to mobilise communities to support reestablishment of critical wildlife habitats, while gaining tangible benefits from tourism and other social development projects. This body will also coordinate the activities of the conserved areas and promote coexistence between livestock and wildlife. Appreciating that several community-based conservation organisations and NGOs are already working in the area, MMWCA will work with them to establish the umbrella coordinating body.

In the greater Olderkesi Conservation Area, MMWCA will work with Cottar's Wildlife Conservation Trust (CWCT) to create community-conserved areas between Olderkesi and Loita forest to secure the habitat connectivity between MMNR and the forest and beyond in Kajiado west.

Action 2.3: Establish an ecosystem level agricultural coordination association

The GMME has intensive rain-fed farming areas at the periphery of the primary GMME boundary and around areas adjacent to Loita Forest. Irrigated farming is practiced around Narosura, Olderkesi, and Mosiro. Whereas crop agriculture will not be promoted in the rangelands of the GMME, the existing irrigated areas will be supported. The rainfed farming areas will be supported to intensify crop production to prevent expansion into the rangelands. To ensure proper coordination of crop agriculture, MMWCA will work with the CGN Agriculture Department to establish an agricultural farmers association. In regard to this, the representativeness of the existing farmers cooperatives or associations will be assessed. Thereafter an overall body to represent all farming groups will be formed. A guide on mainstreaming conservation in farming systems will also be prepared.

Action 2.4: Identify a partnership to formalize adoption of green centers within the network of community centres

One of the major causes of habitat fragmentation and blockage of traditional wildlife movement routes is the unplanned human settlement, especially the urban centers. The urban centres are growing with increase in population and infrastructure improvement e.g. roads and electricity supply, choking wildlife corridors. To ensure that these urban centres are developed with due consideration of conserving the environment, MMWCA and CGN will spearhead the formation of partnerships that will promote the development of green centres in the GMME. This will be in addition to developing land use plans for these centres to control rapid urban developments.

Action 2.5: Strengthen women and youth inclusion in ecosystem decision making, programs, activities and benefit-sharing

Women and youth can play a crucial role in realizing the objectives of this plan if they are actively engaged in all aspects of its implementation. For instance, many of the community rangers that conduct wildlife security activities in the GMME are in the youth category, and their support is critical if wildlife security is to be ensured.

Considerable efforts have been made on the gender equity. Many institutions, such as MMWCA and CGN have established offices specifically dedicated to gender issues which help monitor gender representation and bring important issues to the attention of management. However, there is no recognized minimum principles and standards. The national constitution recommends that no gender takes more than two-thirds of positions. But this is merely a nominal provision and mostly applies to public positions. Consequently, under this action, there is a need to develop some guidelines and principles with a view to coming up with some standards which all operators in the ecosystem can borrow from and work towards their realization. Once the guidelines are created, there is need to carry out a sensitization campaign among the stakeholders and provide a framework for monitoring. In addition, a gender mainstreaming strategy will be developed and used to guide plan implementation, monitoring and evaluation. Towards this, a detailed analysis of gender mainstreaming needs will be conducted. The strategy will seek to mainstream gender and use tested approaches to women's economic empowerment. In addition, to further ensure that women and youth take active roles in conservancy governance and management, women and youth will be trained on all aspects of conservancy management and participation in GMME programmes will be monitored.
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RESEARCH AND KNOWLEDGE MANAGEMENT PROGRAMME

Programme Goal and Guiding Principles

Programme goal

The goal of the Research and Knowledge Management Programme is:

To conduct and coordinate research in the GMME to enable the provision of accurate data and information to support management decision making

Guiding principles

Four strategic principles that will guide the implementation of the Research and Knowledge Management Programme over the next 10 years and the achievement of the programme goal are set out below. Wherever appropriate, guidance has been drawn from relevant national and international laws, policies, plans and programmes.

In the implementation of this Research and Knowledge Management Programme, stakeholders will adhere to the following principles:

Undertaking and coordinating wildlife research

Wildlife research is an essential component of ecosystem conservation and management. It involves devising targeted research programmes and collecting and analysing data to inform management. Important data to be collected include habitat changes, vegetation species composition and biomass over time. For wildlife, there is a need to collect data on wildlife populations and movements, species composition and variations according to seasons and habitats.

Although WRTI has the legal mandate to conduct wildlife research, it has no capacity to do this as it lacks the requisite human resources and equipment to undertake research. However, there are institutional and individual researchers that have the capacity and have been conducting research on various topics in the GMME. Under this programme, therefore, WRTI will build its research capacity so that it can play its rightful role of leading and coordinating wildlife research. It will also implement research coordination mechanisms to ensure that research is well coordinated and research outputs are disseminated to stakeholders.

Making research data and information readily and widely available to decision makers, wildlife managers, researchers and academicians

The WCMA, 2013 gives the WRTI the responsibility for establishing a comprehensive wildlife database in collaboration with relevant stakeholders and making data and information

available to stakeholders such as ecosystem managers. Principle 11 of the CBD guidelines on the ecosystem prescribes that ecosystem managers "consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices" when managing their ecosystems. Hence, under this programme, WRTI and partners will generate scientific information and organize it in a comprehensive GMME database to facilitate sharing with stakeholders.

Conducting disease surveillance

Wildlife disease is a potential conservation risk that should be kept to a minimum through proactive management in the form of disease surveillance. Serious outbreak of wildlife diseases can have a devastating impact on threatened wildlife species whose numbers are suppressed. It is for this reason that a continuous surveillance of wildlife diseases is needed to detect wildlife diseases and make timely interventions to address disease outbreaks.

The WCMA, 2013 mandates WRTI to "*undertake wildlife disease surveillance and control".* Hence, under this management programme, WRTI will collaborate with other stakeholders in instituting a wildlife disease surveillance programme and in controlling wildlife diseases.

Promoting institutional collaboration in wildlife research

Institutional collaboration is recognised in all policies and laws dealing with conservation and wildlife management. EMCA 1999 states in the preamble the need to appreciate the multisectoral nature of environment and engage a diverse range of stakeholders. Article 51 (i) of WCMA 2013 states that WRTI can "*enter into association with other institutions of learning, within or outside Kenya, as the Institute may consider necessary or appropriate and in furtherance of wildlife research and training*. In addition, the CBD guidelines on ecosystem approach under Principle 12 states that the ecosystem approach should involve all relevant sectors of society and scientific disciplines. Hence, to ensure that the limited research funds are used efficiently, collaboration among researchers will be promoted.

These guiding principles are intended to guide the implementation of the Programme's four management objectives that, when taken together, achieve the Programme Purpose. These objectives are:

MO 1. Coordination and compliance with wildlife research protocols improved
MO 2. Scientific data and information generated to support planning and decision making
MO 3. Collaborations and partnerships in wildlife research enhanced
MO 4. The MMRS's capacity to conduct and coordinate wildlife research strengthened

The following sections describe these management objectives and the corresponding management actions needed to achieve them. Under each management objective and action, a rationale and a description of how the objective or action will be achieved is provided.

Management Objectives and Actions

Objective 1: Coordination and compliance with wildlife research protocols enhanced

The WCMA, 2013 mandates the Wildlife Research and Training Institute (WRTI) to conduct and coordinate wildlife research in Kenya. At the Headquarter level, research coordination involves understanding research needs in various ecosystems, disseminating this information and developing wildlife research protocols to potential researchers, issuing research permits, and monitoring licensed research projects to ensure adherence to the approved guidelines, standards and procedures in accordance with the conditions outlined in the issued research permit.

At the GMME, Wildlife research is coordinated by the Masai Mara Research Station, a satellite station of WRTI. However, the Station lacks mechanisms and capacity to effectively coordinate research activities in the GMME. Key research findings have not been disseminated to the stakeholders and various actors for implementation due to inadequate resources and a coordination framework. Skeletal staff strength and unreliable transportation and conference facilities at the MMRS have hindered research coordination. This objective has therefore been designed to address weaknesses in research coordination and non-compliance with the WRTI research protocols. The management actions that will be implemented to achieve this objective are elaborated in the following sections:

Action 1.1: Develop an integrated wildlife data and information system for the GMME

The MMRS is the focal point for ecological research at the GMME. However, as mentioned elsewhere above, it is ineffective in achieving its coordination role due to inadequate infrastructural and human resource capacity. However, with the establishment of the WRTI, which is a government-funded entity, the current weaknesses are expected to be addressed, making MMRS able to deliver on its mandate.

As part of its efforts to improve research coordination and dissemination of research findings, MMRS will work with CGN and Mara Conservancies to develop an ecosystem-wide integrated wildlife data and information system that will collect, store and share research information in a user-friendly and easily accessible way. The information system will contain information on research and monitoring activities (including historical and current wildlife census data) and research publications. It will also contain a database of current and previous research projects and information on researchers operating in the region or those who carried out research in the GMME in the past. The information system will also contain a sub-module of the biodiversity inventory of the GMME. To actualize this, WRTI will work with other public and non-public research institutions and independent researchers that have conducted or are conducting research in the GMME. Moreover, the information system will include a digital herbarium and museum of plant and animal species collections of GMME. Organising research information and making it easily accessible is expected to increase the visibility and support of GMME research among the research community, planners, decision makers and academicians.

Action 1.2: Coordinate wildlife research conducted by local and international researchers

Currently, there is no forum to bring together GMME researchers to engage and share their research projects or findings. This denies ecosystem managers an opportunity to appreciate the implications of research findings to the management of different ecosystem components. Consequently, to improve research coordination, MMRS will organise research seminars for researchers to give progress and to disseminate their research findings. In addition to the seminars, MMRS will also prepare and disseminate research newsletters and publications to researchers and ecosystem managers. The seminars will be conducted quarterly, taking cognizance of the time and resources needed for planning them.

Action 1.3: Organize annual GMME research conferences

Scientific meetings are at the heart of a scientist's professional life since they provide an invaluable opportunity for learning, networking, and exploring new ideas and collectively developing scientific agendas[64]. Therefore, as part of research coordination, MMRS will work with other research stakeholders to organise an annual research conference for the GMME.

Objective 2: Scientific data and information generated to support planning and decision making

The future desired state for natural resource conservation and management at the GMME is where management decisions are based on sound scientific information. Over the years, there has been inconsistency in data collection by different institutions leading to either duplication of data and information while creating knowledge gaps in the unexplored research disciplines. This objective is therefore designed to ensure that scientific information is generated to support management decision making. The management actions that have been designed to achieve this objective are elaborated in the following sections.

Action 2.1: Design and implement a long-term ecological monitoring programme

Ecological Monitoring Programmes are essential for tracking changes in environmental and habitat conditions and their interactions with species. Currently, MMRS lacks a consistent ecological monitoring programme that tracks changes in environmental factors (e.g. weather, vegetation, wildlife, water) in the ecosystem. Therefore, MMR, with technical and financial support from WRTI Headquarters, will design and implement a long-term ecological monitoring programme for the GMME. This programme will be based on the ecological monitoring protocols developed by WRTI for all research stations under it.

Action 2.2: Conduct research on impacts of key threats to ecosystem sustainability and resilience

Habitat loss has been singled out as one of the major threats to the sustainable provision of ecosystem services by the GMME. The conversion of natural habitats to crop farming degrades wildlife and livestock grazing areas, reducing the ecosystem's capacity to effectively produce these two ecosystem services. Therefore, MMRS and stakeholders, in collaboration with WRTI Headquarters, will conduct research on habitat dynamics in the ecosystem. Studies will focus on understanding the drivers of crop farming in this semi-arid area, including land use policies that have been at play in different periods and their

[64] Manuel Corpas, Nils Gehlenborg, Sarath Chandra Janga, Philip E. Bourne. Ten Simple Rules for Organizing a Scientific Meeting. doi: 10.1371/journal.pcbi.1000080

outcomes. The studies will also address the recovery strategies for those endangered species listed in the Sixth Schedule of the WCMA, 2013. Other studies will focus on impacts of: fire in the MMNR, fencing in the GMME; excessive water abstraction from rivers; infrastructural development, such as roads and tourist facilities, invasive species and mapping of wildlife movements and migratory corridors. The research station will also initiate community conservancy governance studies to guide conservancy management and enhance the community administrative framework.

Action 2.3: Conduct studies on Human-wildlife Conflicts

Studies aimed at reducing Human-Wildlife Conflicts will be carried out in an effort to get solutions and mitigation strategies to conflicts. The studies will aim at finding solutions to livestock predation and crop destruction. Experimental research on conflict prevention methods or a combination of methods that would include traditional/indigenous approaches to reduce HWC will be carried out. The studies will further establish systematic monitoring of the effectiveness of interventions, such as scaring, Chilli, beehives, drones, predator proof bomas, aerial wildlife drives and translocations of problematic animals.

Action 2.4: Conduct and coordinate bio-prospecting on wildlife resources to enhance resource utilization and help in galvanizing support for conservation

Bioprospecting and biotechnology provide a great opportunity to tap into the economic value of genetic resources and to counter cases of biopiracy. KWS and WRTI strive to advance the Sustainable Development Goals without undermining the ecological capital. It is well known that plants are an abundant source of medicinal drugs and bioprospecting has been an important resource for discovering new drugs as part of the ecosystem services. Bio-prospecting of natural resources can galvanize support for the conservation of natural resources and improve the use of indigenous knowledge in conservation. Under this management action, therefore, KWS and the WRTI will conduct continuous bioprospecting missions in the GMME to identify how indigenous knowledge may be embedded in modern management practices while enhancing wildlife utilization.

Action 2.5: Conduct ecosystem valuation to inform conservation policy decisions

Valuation plays an important role in creating markets for the conservation of biodiversity and ecosystem services, for instance through Payments for Ecosystem Services. The market creation process comprises three main stages: demonstration of values, appropriation of values and sharing the benefits from conservation. Using the Total Economic Value (TEV) framework, ecosystems may generate output values (the values generated in the current state of the ecosystem, e.g., food production, climate regulation and recreational value). Moreover, the TEV framework may be used as a basis for obtaining insurance values required for threatened or endangered species and habitats as well as addressing uncertainties, such as drought and disease outbreaks[65]. Hence, to understand the total economic value of the GMME, the WRTI, CGN, and the KWS will conduct an economic valuation of the ecosystem after every 10-years and periodically update the TEV based on the prevailing socio-economic conditions of the area.

Action 2.6: Provide planning and advisory services

To ensure that research information generated by WRTI, WRTI-affiliated researchers and other researchers is used to inform management decisions, WRTI will work with conservation

[65] Pascual, Unai & Muradian, Roldan & Brander, Luke & Gomez-Baggethun, Erik & Martín-López, Berta & Verma, Madhu & Armsworth, Paul & Christie, Michael & Cornelissen, Johannes & Eppink, F. & Farley, Joshua & Loomis, John & Pearson, Leonie & Perrings, C. & Polasky, S.. (2010). The Economics of Valuing Ecosystem Services and Biodiversity.

practitioners in the GMME to develop protected area (National Reserve and conservancies) plans and ecosystem-level species management and recovery strategies. In this regard, MMRS will collate and synthesize resource information under its custody to inform the planning processes. Further, it will provide technical assistance in conducting Environmental Impact Assessments (EIAs) and Environmental Audits (EAs) of development projects in the ecosystem, and biodiversity assessments on identified critical wildlife areas, such as potential conservancies and easement areas, within the GMME.

Objective 3: Collaborations and partnerships in wildlife research enhanced

The future desired state of the GMME regarding wildlife research is an ecosystem with a robust research programme and where different agencies and institutions forge strong partnerships.

The ecosystem has continued to attract diverse research interest locally and internationally. This is due to its reputation for hosting high wildlife biomass and the trans-boundary connection with Serengeti National Park in Tanzania. The GMME is also one of the few places with significant populations of large carnivores which face conservation threats in the rest of the world. Hence, there are many research and conservation programmes and projects studying specific wildlife species or focusing on a broad array of wildlife species. The research programmes come from individual researchers, while some researchers are affiliated with learning institutions locally and abroad. There are many research-oriented institutions that carry out specific projects geared towards better understanding and generating knowledge to support conservation. The ecosystem also attracts many researchers interested in general savanna ecology leading to several projects that focus on vegetation and habitat changes and their impacts on wildlife and livestock. The presence of many research activities has a significant contribution to the ecosystem. It means many aspects of the ecosystem functioning are being documented and a lot of knowledge being generated. However, most of this work ends up with individual institutions as there is no formal framework for the coordination and planning of research.

This calls for more collaboration by the stakeholders in research to ensure better partnerships that will lead to better research and management. Such partnerships will also benefit all stakeholders as they develop more research activities and fundraising.

The actions that will be carried out to realize this objective are elaborated in the following sections:

Action 3.1: Establish linkages and collaborations with researchers in the GMME

There are many researchers from across the world based in the GMME. There are long term projects sponsored by different institutions, some of which have run for many years. Examples include the Mara Predator Conservation Project (MPCP) and the Mara Elephant Project (MEP). Both projects work closely with the reserve management, conservancies and KWS in collaring animals and tracking their movements.

However, collaboration among researchers are weak, which leads to an overlap in resource and research activities while creating gaps in research that would be filled with better partnerships and coordination. More collaboration would also lead to information sharing on

methods and technologies in research and monitoring. To address this anomaly, researchers and institutions will be encouraged to develop Memoranda Of Understandings (MOUs) to set out clear collaborative guidelines. In this regard WRTI, as the wildlife research coordinating institution, will identify the institutions involved in long term research activities in the ecosystem, develop an electronic platform to register all research activities by different institutions, and draw collaborative MoUs with the research projects specifying the role and obligations of individual institutions in wildlife research and the research monitoring protocols to be followed.

Action 3.2: Work with "One Mara Research Hub" to improve research coordination and information sharing

Research stakeholders in the GMME are working together to establish a Research Hub, One Mara Research Hub (OMRH). The Hub brings together national and local government agencies, researchers and academic institutions, development partners, community members, and other key stakeholders in the Greater Mara Ecosystem to share and use information so that change can be effected at the policy level and on the ground. Currently the OMRH is developing an online portal that will host the meta-databases of research findings from the ecosystem. To enhance research coordination and information dissemination, WRTI will work closely with the OMRH. With respect to this, WRTI will share information under its custody with OMRH as per the WRTI information-sharing protocols. It will also encourage researchers that it licenses to conduct research in the GMME to share research outputs with the OMRH. In addition, WRTI will involve the OMRH network of researchers in organising the GMME annual research conference, seminars and workshops.

Action 3.3: Establish partnerships with other research institutions in information exchange and networking to support wildlife conservation and management

Partnership is a collaborative relationship between entities to work towards shared goals and objectives through mutually agreed frameworks that stipulate joint activities or actions. This is expected to add value to each party's work and reduce on duplication of activities.

At the GMME, WRTI will enhance collaborations and partnerships with KWS, conservancies, Government institutions, development partners and other stakeholders to deliver practical solutions on the ground and at strategic level and to increase its resource mobilization capacity through innovative financing. Additionally, WRTI will establish partnerships and cooperate with other research organizations and institutions of higher learning in joint research and training. Mara research and information system will be established at the research station and through an established framework, all researchers will be able to engage, access and share data and scientific information. Other areas of collaboration include preparing threatened and endangered species recovery plans; strategic environmental assessments for policies, plans and programmes; and environmental impact assessments for projects within wildlife conservation areas, dispersal areas, and corridors. Scientific data sharing and information dissemination will be key outputs for WRTI from these partnerships. Further, WRTI will identify research needs and gaps in the ecosystem; identify strategic institutions to support long term research projects; and develop joint research funding proposals.

Action 3.4. Conduct collaborative cross-border wildlife censuses

As mentioned elsewhere in this document, the GMME is part of the larger Serengeti-Mara ecosystem that traverses the Kenya-Tanzania Border. Home ranges of many wildlife species on the Kenyan side of the ecosystem extend to Serengeti National Park and beyond in Tanzania. Given that the GMME shares many landscape species with Serengeti, there is a

need for cross-border collaboration in wildlife protection and management, and wildlife research and monitoring.

WRTI has been collaborating with Tanzania wildlife management and research institutions in conducting cross-border aerial wildlife census. This collaboration will be continued and strengthened to ensure that there are no gaps in wildlife population data. Towards this, WRTI Headquarters will establish strong collaborative linkages with its Tanzanian counterpart, TAWIRI, to ensure that wildlife census in the Kenyan and Tanzanian Parts of the Serengeti-Mara Ecosystem are synchronized. Already, wildlife census methodologies have been harmonised and several cross-border censuses have been conducted. In addition, the domestication of the Arusha declaration on cross-border wildlife species and habitats will be achieved.

Action 3.5: Initiate and support a Climate Information Hub (CIH) at the grassroot level

Many pastoralists depend on information on rainfall and water to move their animals and manage their livestock herds. Timely weather forecasts is therefore essential to make this information readily available. Therefore, there is a need to initiate and support a Climate Information Hub (CIH) at GMME that will provide information in a format that the local pastoralist or farmer can understand and use. Also, the hub will be used to plan for the projected climate and how it might affect grazing in GMME. It will be setup by a group of independent climate and policy researchers (local Universities, ICPAC, KMD, and KIPRA) and internet providers (Safaricom, Airtel and Telecom) and it will use information technology, especially phones to reach local people. The resources needed to build the Hub includes finance, training of local communities on climate science, recruitment of personnel to manage the hub and a communication person to disseminate information to people in both English and in Maa language.

Action 3.6: Undertake a climate risk and vulnerability assessment for the GMME, and set out priority adaptation actions

Humans are estimated to have caused global warming of approximately 1.0°C by 2017 relative to pre-industrial levels, with average temperatures over the past 30 years rising by 0.2°C per decade. The frequency and intensity of extreme weather events, and the fires, floods and droughts that they can bring, have increased in the past 50 years[66]. These changes have contributed to widespread impacts in many aspects of biodiversity, including species distribution, phenology, population dynamics, community structure and ecosystem function. However, in the region, few studies have analysed the potential impacts of projected changes in climate on these resources.

Therefore, under this management action, climate risk and vulnerability assessments for the GMME will be undertaken. The study will prepare GMME to target and plan for the adaptation and mitigation initiative in natural resource management (wildlife and forest conservation), tourism, agriculture, infrastructure, health and governance. The research will be led by MMWCA working with climate policy researchers, ecologists, environmental economists and development planners. This will be done in collaboration with local universities (e.g. Institute for Climate Change and Adaptation, University of Nairobi, IGAD Climate Prediction and Applications Centre (ICPAC), Kenya Meteorological Department (KMD), Kenya Institute for Public Policy Research and Analysis (KIPRA), and Consultative Group for International Agricultural Research (CGIAR) centres and UN agencies (UNEP and UNDP).

[66] IPBES (2019). Summary for policymakers of the global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

Action 3.7: Integrate indigenous and local knowledge into climate adaptation policies and practices

Traditional knowledge needs a role in global climate discourse. IPCC's Fourth Assessment report of 2007[67] noted that indigenous knowledge is "an invaluable basis for developing adaptation and natural resource management strategies in response to environmental and other forms of change. Therefore, there is a need to advance the understanding of climate change vulnerability, adaptation and mitigation related to indigenous people, and there is a need to provide this information to policymakers.

In the implementation of the proposed climate change actions in this plan there will be a need for integration of indigenous and local knowledge into climate adaptation policies and practices through documenting local knowledge of climate change and its social and economic impacts on the community, and identifying barriers to incorporating local knowledge into climate science. This exercise will be done by climate and social scientists in collaboration with local communities.

Objective 4: The MMRS's capacity to conduct and coordinate wildlife research strengthened

Masai Mara Research Station (MMRS) is located in Masai Mara National Reserve south-west of Sarova Mara Tented Camp and about 8 km from the Sekenani Gate. The Research Station was officially opened in 1975 by the then Minister for Tourism and Wildlife. The purpose of its establishment was to conduct wildlife research throughout the GMME and the adjacent areas. In the 1970s the Station primarily focused on conducting species research and habitat and wildlife population dynamics. This led to the publication of scientific papers in peer-reviewed journals, the establishment of a herbarium and the wildlife monitoring programme. However, government investment in wildlife research petered out in the late 1970s and 1980s due to inadequate research funds affecting research work at the station immensely.

The future desired state of the GMME is, therefore, where the MMRS is well resourced to effectively conduct and coordinate research on ecosystem values and drivers of changes to these values. To ensure that the MMRS is revamped, a set of management actions focusing on strengthening human and physical resources capacity will be implemented. These are set out in the following sections.

Action 4.1: Strengthen the MMRS's human resource capacity

The Mara Research Station suffers human capacity constraints due to a lack of adequate and well-trained scientific staff. For the station to perform optimally as a research station in line with the vision of this management plan, there is a need for qualified scientists to be deployed to the station in line with the station's organisational structure. However, before this is done, a staff needs assessment will be conducted to determine the optimal staff that the station requires. Thereafter, WRTI will deploy suitable staff at the research station. And to ensure that staff have the requisite skills to conduct and coordinate research in a rangeland ecosystem, staff will be trained in relevant skills, including the application of GIS and Remote sensing in land use/cover change analysis; and wildlife census methodologies.

[67] IPCC (2007). Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 976pp.

Action 4.2: Construct and rehabilitate buildings

Since the vision of the MMRS is becoming a centre of excellence in wildlife research in the country, there is a need to construct additional office and residential buildings to cater for office needs of researchers that will be deployed at the station.

The station has residential houses for staff and guest houses for external researchers, but these buildings' current status is wanting. The buildings require rehabilitation to make them comfortable for use by researchers; they also need furnishing.

Therefore, under this management action: an assessment of additional office space and residential requirements will be conducted based on the optimum staffing levels determined under Management Action 4.1 of this objective. Rehabilitation needs for buildings will also be determined and funds sought to construct and rehabilitate the offices, residential houses.

Action 4.3: Liaise with WRTI Headquarters in the procurement of field equipment

The MMRS is in dire need of research equipment to conduct serious wildlife research and monitoring. This, coupled with the lack of human resource capacity, impedes the effectiveness of the research station and makes it unattractive to external researchers and scholars. Therefore, under this management action, MMRS will review the station's research needs and capacity; identify the priority research equipment for the station; liaise with WRTI to procure priority equipment, and train staff on use and maintenance of the acquired equipment.

Action 4.4: Establish a well-equipped GIS and remote sensing lab

A GIS and Remote Sensing lab is an essential facility for a research station. It supports the analysis of spatial information and the generation of spatial scenarios to support research and planning. The MMRS lacks such a lab. Therefore, efforts will be made to establish a well-equipped GIS lab. Towards this, MMRS will benchmark with other research centers on the GIS and remote sensing laboratory; modern equipment for GIS and remote sensing will be identified and proposal for their procurement developed; the equipment will be procured; and a GIS and remote sensing scientist deployed to run the lab.

Action 4.5: Improve the management, operations and resources of the MMRS' veterinary unit

The veterinary unit is handicapped due to a lack of well-equipped facilities for handling and storing samples and other activities that aid successful wildlife management. There is a need to develop capacity within the ecosystem so that activities do not depend on WRTI headquarters or other labs and research stations outside the ecosystem. To address the shortcomings of the MMRS Vet Unit, an appraisal of vet lab requirements will be conducted and based on the outcome of this appraisal, a funding proposal on the required veterinary resources will be developed. MMRS will thereafter liaise with WRTI Headquarters to solicit for funds to support clinical interventions, disease surveillance and veterinary research. Moreover, there is a need to strengthen a mobile vet unit for rapid response to cases of wildlife in distress from injuries or diseases. Consequently, the requirements for a fully functional mobile vet unit will be assessed and required tools and equipment procured based on this assessment.

Action 4.6: Build a holding facility for injured or sick animals during treatment, and problem animals during pre-release confinement

Despite the ecosystem having many wildlife operations, there is no facility for the temporary sanctuary of animals that require special care. These include injured or sick animals, captured problem animals, or young ones of species of special concern that are abandoned by mothers through predation or other reasons. This calls for building a holding facility within the ecosystem and clear understanding among stakeholders on the need for such a facility. Therefore, under this management action, MMRS will discuss and seek consensus with all stakeholders on the need for a holding facility in the ecosystem; identify a suitable location for the facility within the land allocated to MMRS; raise funds for the facility; construct the facility; and deploy adequate qualified staff to man the facility.

Action 4.7: Construct better carnivore transport cage and traps

Carnivore capture is a critical component of wildlife management. The carnivores are captured for research or when they are involved in human-wildlife conflict activities outside the national reserve. The technology for capture and transport needs to be upgraded for efficiency and to ensure minimal harm on the animals. Therefore, high standard cages will be constructed for this purpose. However, for the construction of the cages, MMRS will benchmark with other stations and leading national parks on capture and handling techniques; and identify appropriate specifications for cages and facilities like traps for carnivores.

Action 4.8: Rehabilitate herbarium and animal species collections

A herbarium and a museum are important components of a research station. Successful research requires proper documentation and safe storage of specimens and samples. The herbarium and the insect collection room at the research station require upgrading. There are also old collections that have deteriorated over the years. These collections need to be prepared for fresh preservation and documentation so that the records are not lost and future research work compromised by lack of past data. Therefore, to address these issues, MMRS will conduct a situational analysis of the herbarium to identify gaps in its status; upgrade the storage facilities; rehabilitate all the collections for fresh preservation; and develop a program for herbarium collection and maintenance.

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PLAN IMPLEMENTATION, MONITORING AND EVALUATION

Plan Implementation and Financing Arrangements

Introduction

This chapter presents the implementation plan for the GMME management plan (Table 16). This plan takes the management actions elaborated in detail under the five management programmes and breaks them into activities that are prioritized according to those that need to be implemented in the short-term (1-3 years), medium-term (4-6 years), and long-term (7-10 years). The implementation plan also identifies the institutions that will take the lead role in the implementation of individual management activities and the key partners that will be involved.

To ensure that plan implementation is well-coordinated, a plan implementation structure bringing together all the stakeholders in the ecosystem is proposed (Figure 23). The roles and responsibilities of critical actors in the implementation of the plan are also provided (Table 15).

The implementation and financial arrangements are described in the following sections.

Implementation arrangements

This management plan acknowledges that there is no single institution that can effectively implement the ecosystem plan as the lead institutions have limited mandate over ecosystem resources. For instance, CGN has full jurisdiction over the MMNR but limited influence in the conservancies. Similarly, MMWCA, through the conservancies land owners, has jurisdiction on the management of conservancies but little influence on the MMNR. KWS has the responsibility of overseeing wildlife security and controlling human wildlife conflict but has no jurisdiction on how the wildlife habitats are used. On the other hand, WRTI is restricted to conducting and coordinating wildlife research. Given these institutional limitations, and considering that there are other key partners that are willing to support plan implementation, there is a need for a plan implementation structure that is endorsed by the plan implementers.

As discussed under Action 1.1 of the Institutional Collaboration and Governance Programme, the key mechanism for plan implementation will be the Plan Implementation Committee, which will be coordinating implementation of planned activities. This committee will comprise the plan implementers and key partners that are involved in programmes and projects on various aspects of ecosystem management.

The plan implementation structure is illustrated in Figure 23, while Table 15 provides the roles and responsibilities of stakeholders in different tiers of the implementation structure.

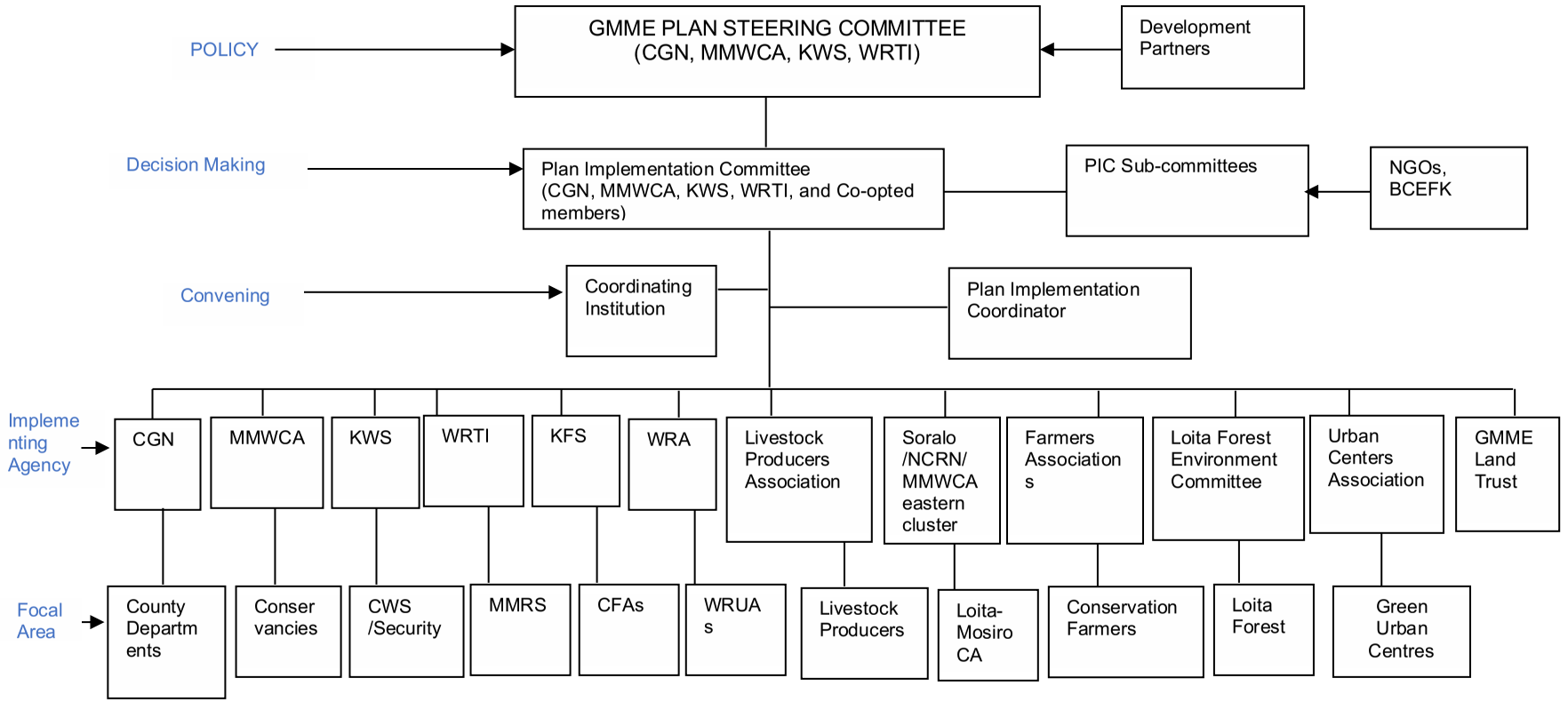

Figure 23. Proposed plan implementation governance structure

Table 15. Roles and responsibilities of different actors in the plan implementation governance structure

Organizational tier	Role and responsibilities
GMME Plan Steering Committee	• Policy direction • Approval of joint action plans drawn from the ecosystem plan • mobilize resources for to support plan implementation • Allocating funds to facilitate plan implementation and coordination
Plan Implementation Committee	• coordinate plan implementation; • monitor and evaluate plan implementation • identify constraints in plan implementation; • produce annual progress reports on plan implementation; and • recommend review of the ecosystem management plan
PIC Sub Committees	**Conservation and tourism committee** • natural resource management, • tourism, • education, • research and monitoring; **Development committee** • Green centres, • livestock, • climate smart agriculture, • settlement, • enterprise, and • human well-being aspect; **Resource mobilization, monitoring evaluation and learning committee** • budgets, • fundraising, • data systems and • monitoring and evaluation.
Plan Coordination Institution	• Convening PIC and Steering Committee meetings • Hosting the Plan Implementation Coordinator
Plan Implementation Coordinator	• Coordinating PIC activities • Plan monitoring and evaluation • Development of PIC annual work plans and budget
Implementing Agency	• Coordination of specific programmes and actions at the institutional level • Coordination of preparation of institutional progress reports • Coordination of annual work plans and budget for implementation of the ecosystem plan
Focal Area	• Implementation of specific management actions • Preparation of progress reports on plan implementation • Preparation of annual work plans and budgets

Financing arrangements

There are different categories of activities to be funded as part of the implementation of the plan. These are:

- **The salary and emoluments of the Plan Implementation Coordinator**. The Plan Implementers will recruit the Coordinator on a contractual basis. This position will be funded through one of the projects being implemented in the ecosystem.

- **Committees meetings and coordination activities**. The committees' activities will be funded by the institutions represented in the committees. Each institution will facilitate its representatives in the committees to participate in the committees' meetings and other coordination activities.

- **Implementation of activity plans**. This plan will be implemented through annual work plans that will be drawn by the PIC, in consultation with key implementing agencies, and approved by the Steering Committee. Stakeholders will implement assigned activities with their own funds and report progress periodically to the PIC.

Table 16. Implementation plan

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
1. NATURAL RESOURCE CONSERVATION & MANAGEMENT PROGRAMME					
Programme Goal: To sustainably manage the GMME's natural resources for provision of ecosystem services and other benefits of nature to the local community, the country, and the world in general					
Objective 1: Rangeland resources are sustainably managed to support healthy wildlife and livestock populations					
Action 1.1: Identify and map critical wildlife corridors and dispersal areas					
1.1.1 Map threats and land owners along identified wildlife corridors	**X**			MMWCA	WRTI, KWS, BCEFK
1.1.2 Develop a strategy for securing the wildlife corridors that considers a wide range of intervention measures, such as conservation easements, land leases, establishment of conservancies, and compensation for removal of fences	**X**			MMWCA	CGN, TPs, BCEFK
Action 1.2: Secure wildlife corridors and dispersal areas					
1.2.1 Solicit for funds to secure identified corridors and development of lease agreements	**X**	**X**	**X**	MMWCA	DPs, BCEFK
!.2.2 Support the registration of appropriate conservancy governance instruments	**X**	**X**	**X**	MMWCA	KWS, BCEFK
1.2.3 Support the implementation of a legal body to sign and register leases	**X**			MMWCA	CGN, TPs, BCEFK
1.2.4 Develop a functioning revenue model tailored to the available revenue sources of each conservancy	**X**			MMWCA	TPs, BCEFK
1.2.5 Partner with local wildlife organizations to monitor the effect of new conservancies on wildlife populations	**X**	**X**	**X**	MMWCA	NGOs, BCEFK
Action 1.3: Support removal of fences to increase space for wildlife and habitat connectivity					
1.3.1 Develop a proposal and program for compensating landowners who de-fence their land to allow wildlife movement	**X**			MMWCA	DPs, BCEFK
1.3.2 Draw lease or conservation easement agreements with landowners	**X**	**X**	**X**	MMWCA	TPs, BCEFK

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
on wildlife corridors					
1.3.3 Promote use of alternative non-wood fencing materials (e.g. plastic poles) to minimize impacts of fencing in areas practicing crop production.	X	X	X	MMWCA	NGOs, BCEFK
1.3.4 Update the fencing status map in the ecosystem continuously	X			MMWCA	NGOs, BCEFK
Action 1.4: Control overgrazing in the GMME					
1.4.1 Conduct participatory assessment of the conservancies and the areas outside conservancies to determine and recommend the appropriate livestock stocking rates.	X			MMWCA	NGOs, BCEFK
1.4.2 Manage livestock grazing based on the recommended stocking rates and the conservancy's grazing plan	X	X	X	MMWCA	Community, BCEFK
1.4.3 Restore degraded areas by excluding livestock and allowing the areas to recover naturally	X	X	X	MMWCA	Community, BCEFK
1.4.4 Restore severely degraded areas by grass reseeding and covering the reseeded bare areas with branches to minimize grazing pressure	X	X	X	MMWCA	Community, NGOs, BCEFK
1.4.5 Implement gulley healing measures such as filling the gulley with dead branches	X	X	X	MMWCA	Community, NGOS, BCEFK
Action 1.5: Control urban development					
1.5.1 Prepare land use development plans for urban centres in the GMME in accordance with the Physical Planning Act, 2019	X	X	X	CGN	MMWCA
1.5.2 Design and implement an environmentally friendly waste disposal system for each urban centre	X	X	X	CGN	MMWCA
Action 1.6: Control invasive species					
1.6.1 Identify and map the distribution of invasive species through research expeditions,	X	X	X	MMWCA	KWS, WRTI, BCEFK
1.6.2 Develop an ecosystem-wide standard operating procedure for controlling and managing invasive species	X			MMWCA	KWS. WRTI, BCEFK
1.6.3 Conduct continuous manual removal or biological control of invasive species.	X	X	X	MMWCA	KWS. WRTI, DPs, BCEFK
Action 1.7: Develop an ecosystem-wide fire management strategy					
1.7.1 Formulate and implement prescribed fire management plan	X			MMWCA	Community, BCEFK
1.7.2 Construct fire breaks in areas prone to wildfires		X		MMWCA	Community, BCEFK
1.7.3 Establish a rapid-fire response team	X			MMWCA	Community

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
1.7.4 Procure fire fighting tools and equipment	X			MMWCA	DPs, BCEFK
Action 1.8: Support Conservancies to widen income opportunities					
1.8.1 Conduct studies on the potential of GMME as a carbon sink	X			MMWCA	DPs, BCEFK
1.8.2 Develop a carbon credit project and bench mark it with the successful carbon credit schemes in Taita Taveta Conservation Area	X	X		MMWCA	DPs, BCEFK
1.8.3 Explore alternative income opportunities for conservancies other than tourism	X	X	X	MMWCA	DPs, BCEFK
1.8.4 Advocate for the gazettement of consumptive wildlife utilization guidelines so that conservancies can legally explore commercial opportunities in wildlife products	X	X	X	MMWCA	KWS, BCEFK
Action 1.9: Support establishment of wildlife conservancies					
1.9.1 Support land owners wishing to establish conservancies to conduct feasibility studies of the conservancies	X	X	X	MMWCA	Community, DPs, BCEFK
1.9.2 Support conservancies in the development of management plans and registration with KWS	X	X	X	MMWCA	Community, DPs, BCEFK
,1.9.3 Build the capacity of new conservancies in management and enterprise programmes	X	X	X	MMWCA	Community, DPs, BCEFK
1.9.4 Support community livelihood activities through a well-thought-out grazing and commercialization programme	X	X	X	MMWCA	Community, DPs, BCEFK
Action 1.10: Conduct strategic environmental assessment (SEA) on potential impacts of proposed infrastructure projects on wildlife and livestock keeping					
1.10.1 Solicit for funds to conduct a SEA in accordance with EMCA, 1999		X		MMWCA	DPs, BCEFK
1.10.2 Procure technical assistance to conduct the SEA		X		MMWCA	DPs, BCEFK
1.10.3 Implement the SEA recommendations		X		MMWCA	DPs, BCEFK
Action 1.11: Control charcoal production					
1.11.1 Promote alternative sources of energy in the urban centres within the ecosystem	X	X	X	MMWCA	Community, DPs, KFS, BCEFK
1.11.2 Implement sustainable charcoal production and energy projects in the charcoal production hotspots	X	X	X	MMWCA	Community, DPs, KFS, BCEFK
1.11.3 Work with the Kenya Forest Service and the local administration to enforce the Charcoal Rules	X	X	X	MMWCA	Community, DPs, KFS,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					BCEFK
1.11.4 Promote energy saving cooking Jikos in the urban and rural areas of the GMME	X	X	X	MMWCA	Community, DPs, KFS
Action 1.12: Control tourism impacts					
1.12.1 Work with relevant stakeholders to enforce rules on off-road driving and pollution of rivers	X	X	X	CGN	TPs
1.12.2 Conduct annual environmental audits of tourism facilities	X	X	X	CGN	TPs
1.12.3 Develop a responsible tourism charter for the ecosystem and share it with all ecosystem stakeholders	X			CGN	TPs
Action 1.13: Control sand harvesting					
1.13.1 Advocate for the development and enforcement of environmentally friendly sand harvesting County bylaws		X		MMWCA	CGN
1.13.2 Map and assess environmental and ecological risks posed by sand harvesting		X		MMWCA	CGN
Objective 2: Forest resources are conserved and managed in collaboration with stakeholders					
Action 2.1: Survey and mark forest boundaries					
2.1.1 Survey and mark Loita Forest boundaries to prevent further encroachment	X			CGN	MMWCA
2.1.2 Mark the boundary of Nyekweri Conservancy based on the land parcels joining the conservancy.	X			MMWCA	CGN, BCEFK
Action 2.2: Support establishment of wildlife conservancies at Loita and Nyekweri forests					
2.2.1 Mobilize the community to support the establishment of the conservancies	X	X	X	MMWCA	Community, BCEFK
2.2.2 Support conservancy registration processes	X	X	X	MMWCA	Community, BCEFK
2.2.3 Lease land parcels in Nyekweri Forest	X			MMWCA	Community, BCEFK
2.2.4 Partner with tourism investors to develop tourism facilities in Loita and Nyekweri forest conservancies	X	X		MMWCA	Community, TPs, BCEFK
Action 2.3: Support development of management plans to regulate forest use and access					
2.3.1 Conduct a Natural Resource Assessment to ascertain the	X			MMWCA	CGN, BCEFK

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
availability and extent of natural resources in the forests					
2.3.2 Conduct community planning meetings to develop forest management plans	X			MMWCA	Community, KFS, BCEFK
Action 2.4: Support the Oloibon traditional institution in the management of Loita Forest					
2.4.1 Enter into formal agreements with relevant stakeholders to enhance the delivery of various management components	X			MMWCA	KWS, KFS, Community, BCEFK
2.4.2 Train the elders and youth from the Oloibon institution in forest management practices	X	X	X	MMWCA	Community, KFS, BCEFK
2.4.3 Establish security outposts	X			MMWCA	KFS, KWS, DPs, BCEFK
2.4.4 Procure patrol tools and equipment	X			MMWCA	KFS, KWS, DPs, BCEFK
2.4.5 Recruit community rangers	X	X		MMWCA	KFS, KWS, DPs, BCEFK
2.4.6 Develop Payment of Environmental Services (PES) projects	X			MMWCA	KFS, KWS, DPs, BCEFK
Action 2.5: Conduct a study on forest resource supply and demand					
2.5.1 Conduct a study to determine the growth, yield and extraction levels of wood and non-wood products in Loita Forest	X			MMWCA	KFS, KWS, DPs
2.5.2 Conduct a study to determine the livestock carrying capacities of each forest management section	X			MMWCA	KFS, KWS, DPs, BCEFK
2.5.3 Develop guidelines for permitted forest uses including livestock grazing, honey harvesting, grass harvesting, and collection of medicinal herbs	X			MMWCA	KFS, KWS, DPs, BCEFK
Action 2.6: Support on-farm tree planting in forest-adjacent areas					
2.6.1 Establish on-farm tree planting demonstration plots and use them as focal points for technology dissemination at the farm level	X	X		MMWCA	KFS, DPs, BCEFK
2.6.2 Support communities to establish tree nurseries to produce, for sale, suitable community-preferred tree species adapted to Mau, Loita and Nyekweri forest areas	X	X	X	MMWCA	KFS, CFAs, DPs, BCEFK
Action 2.7: Rehabilitate water catchments areas					
2.7.1 Work with CFAs in planting trees in forest degraded areas	X	X	X	MMWCA	KFS, CFAs,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					DPs, BCEFK
2.7.2 Promote on-farm forestry	X	X	X	MMWCA	KFS, CFAs, DPs, BCEFK
2.7.3 Promote sustainable agriculture to minimise soil erosion and soil and water pollution	X	X	X	MMWCA	KFS, CFAs, DPs, BCEFK
2.7.4 Work with CFAs to secure the forests	X	X	X	MMWCA	KFS, CFAs, DPs, BCEFK
Objective 3: Sustainable water resource management is promoted yielding clean and adequate water for all water users and needs					
Action 3.1: Support development, implementation and revision of Sub-Catchment Management Plans (SCMPs)					
3.1.1 Support all WRUAs to develop or revise their SCMPs to incorporate effective climate change adaptation strategies for livelihood needs and climate risks	X	X	X	MMWCA	WRUAs, BCEFK
3.1.2 Provide WRUAs technical assistance to prepare funding proposals to enable them solicit for funding from partners to support the implementation of the SCMPs	X	X	X	MMWCA	WRUAs, BCEFK
Action 3.2: Work with Water Resource Users Associations (WRUAs) in protecting and rehabilitating riparian areas					
3.2.1 Mark the legally protected river reserve starting with areas that have been encroached	X			MMWCA	CGN, BCEFK
3.2.2 Assess and map the biodiversity status of the riparian land using current remote sensing data to determine riparian areas that have been encroached and those that have been degraded	X	X		MMWCA	CGN, BCEFK
3.2.3 Design and implement a WRUA-led riparian land rehabilitation programme	X	X	X	MMWCA	WRUAs, BCEFK
3.2.4 Work with WRA, NEMA and WRUAs to enforce relevant environmental laws (Water Act, 2016 and EMCA, 1999).	X	X	X	MMWCA	WRA, NEMA, WRUAs, BCEFK
3.2.5 Sensitize land owners abutting rivers on the values of the riparian land	X	X	X	MMWCA	Community, WRUAs, BCEFK
3.2.6 Support new WRUAs in the WRUA formation process.	X	X	X	MMWCA	WRA, NEMA, WRUAs, BCEFK
3.2.7 Build the capacity of WRUAs in the management of water resources	X	X	X	MMWCA	WRA, NEMA, WRUAs, BCEFK

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
Action 3.3: Promote rainwater harvesting for domestic use, livestock, and irrigation					
3.3.1 Work with other stakeholders to sensitize the local community on rain water harvesting technologies	**X**	**X**	**X**	MMWCA	WRUAs, Community, BCEFK
3.3.2 Support community members in construction of water reservoirs to store rainwater	**X**	**X**	**X**	MMWCA	WRUAs, Community, BCEFK
Action 3.4: Control pollution and siltation of rivers					
3.4.1 Work closely with the CGN Department of Agriculture to promote the adoption of soil erosion prevention practices	**X**	**X**	**X**	MMWCA	CGN, BCEFK
3.4.2 Encourage local communities to adopt Integrated Pest Management (IPM) techniques to minimise pesticide usage	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.3 Support the rehabilitation of riparian land and degraded catchment areas to increase vegetation cover	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.4 Support the construction of check dams to control siltation of rivers from road run-off	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.5 Monitor river water quality and quantity, identify pollution sources, and take appropriate management or legal action on polluters	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.6 Encourage livestock keepers to construct water troughs	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.7 Disseminate recommended water quality standards to stakeholders	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.8 Involve the local community in monitoring and reporting water pollution incidents	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK
3.4.9 Discourage car washing along rivers	**X**	**X**	**X**	MMWCA	CGN, Community, BCEFK

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
Objective 4: Wildlife conservation and management enhanced resulting in stable or increasing wildlife populations					
Action 4.1: Control wildlife poaching, minimize illegal wildlife trade, and HWC related wildlife killing					
4.1.1 Work with conservancies and other security partners in gathering wildlife intelligence and disseminating information to partners in a timely manner	**X**	**X**	**X**	MMWCA	NPS, KWS, BCEFK
4.1.2 Work with stakeholders in identifying poaching hotspots and conducting antipoaching patrols in these hotspots	**X**	**X**	**X**	MMWCA	KWS, BCEFK
4.1.3 Support the MIKE programme to ensure that data on elephant deaths is continuously collected	**X**	**X**	**X**	MMWCA	KWS, BCEFK
4.1.4 Collar elephants and monitor their movement	**X**	**X**	**X**	KWS	WRTI, MMWCA
4.1.5 Ear notch rhinos and instal tele-transmitters on them to facilitate rhino identification and monitoring	**X**	**X**	**X**	KWS	WRTI, MMWCA
Action 4.2: Control and manage wildlife diseases					
4.2.1 Work with the County Veterinary Department in conducting disease surveillance and controlling disease outbreaks	**X**	**X**	**X**	KWS	WRTI, CGN
4.2.2 Conduct clinical investigations on all observed sick and dead wildlife to determine the cause or sickness or death	**X**	**X**	**X**	KWS	WRTIKWS, CGN
4.2.3 Conduct a study on wildlife diseases in the ecosystem	**X**			KWS	WRTI, CGN
4.2.4 Implement a wildlife disease surveillance programme	**X**	**X**	**X**	KWS	WRTI, CGN
4.2.5 Establish protocols on wildlife disease control	**X**			KWS	WRTI, CGN
Action 4.3: Intensify monitoring of wildlife species whose populations are declining					
4.3.1 Develop a monitoring programme to provide a framework for monitoring species whose populations are declining	**X**			WRTI	KWS, MMWCA, CGN
4.3.2 Develop and implement species-specific conservation programmes	**X**	**X**	**X**	KWS	WRTI, MMWCA, CGN
Action 4.4: Establish well-coordinated wildlife population monitoring programmes					
4.4.1 Establish long term species monitoring programmes that will be generating information to support ecosystem planning and management	**X**	**X**	**X**	WRTI	KWS, MMWCA, CGN
Action 4.5: Support and strengthen collaboration in transboundary natural resource management					

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
4.5.1 Strengthen the existing cross-border collaboration in wildlife management	X	X	X	KWS	CGN, MMWCA
4.5.2 Conduct quarterly cross-border security meetings	X	X	X	KWS	CGN, MMWCA, TANAPA
4.5.3 Conduct joint or synchronized cross-border antipoaching patrols	X	X	X	KWS	CGN, MMWCA, TANAPA
4.5.4 Share security information as appropriate	X	X	X	KWS	CGN, MMWCA, TANAPA
2. TOURISM DEVELOPMENT AND MANAGEMENT PROGRAMME					
Programme Goal: To develop sustainable tourism that offers memorable experiences to visitors and is a pillar for biodiversity conservation in the ecosystem					
Objective 1: Tourism product diversified and the destination image is enhanced					
Action 1.1: Develop minimum tourism standards					
1.1.1 Benchmark with KWS on different approaches to enforce driver code of conduct and uplift tour guiding standards	X			CGN	MMWCA, TPs
1.1.2 Avail local guides and game drive vehicles to visitors who come in private cars	X	X	X	CGN	MMWCA, TPs
Action 1.2: Enhance and identify new and unique niche tourism products for tourist attraction				CGN	
1.2.1 Conduct a survey to identify potential scenery and landscape features that would support product diversification	X			CGN	MMWCA, TPs
1.2.2 Develop tourism-support infrastructure to support different activities like nature walks, hiking, and birding	X	X	X	CGN	MMWCA, TPs
1.2.3 Conduct benchmarking studies on the diversity of tourism products in competing destinations	X	X		CGN	MMWCA, TPs
1.2.4 Conduct regular sensitization programmes with stakeholders to determine permissible products in the ecosystem	X	X	X	CGN	MMWCA, TPs
Action 1.3: Develop product targeted to domestic tourists at the conservancies					
1.3.1 Develop incentive packages for local tourism	X	X	X	CGN	MMWCA, TPs
Action 1.4: Explore control of visitor numbers around migration					

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
crossing and peak season					
1.4.1 Conduct a study to determine the carrying capacity of visitors at migration crossing and during peak season	**X**			CGN	MMWCA, TPs
1.4.2 Establish measures to maintain visitors within the carrying capacity	**X**			CGN	MMWCA, TPs
1.4.3 Introduce advance booking and ticketing for migration to ensure the set limits are adhered to			**X**	CGN	MMWCA, TPs
1.4.4 Establish a central reservation system at the MMNR		**X**		CGN	MMWCA, TPs
Objective 2: Visitor facilities are diversified and standards improved					
Action 2.1: Streamline tourism business licenses and approval guidelines					
2.1.1 Develop and enforce facility approval procedures and standards for all facilities		**X**		CGN	MMWCA, TPs
2.1.2 Conduct regular facility Audits	**X**	**X**	**X**	CGN	MMWCA, TPs
Action 2.2: Develop minimum space prescription for tourism investments					
2.2.1 Sensitize tourism investors on the need of securing wildlife space in the GMME	**X**	**X**		CGN	MMWCA, TPs
2.2.1 Prescribe minimum space for each tourism facility in a participatory process		**X**		CGN	MMWCA, TPs
2.2.3 Enforce minimum land space prescriptions for tourism facilities		**X**	**X**	CGN	MMWCA, TPs
Action 2.3: Mobilize tourism stakeholders to support the land leasing and conservation easements to secure critical dispersal areas that sustain the Mara tourism brand					
2.3.1 Mobilize tourism selling chain of travel agents and destination marketing companies to support conservation measures gearing towards securing wildlife space	**X**	**X**	**X**	CGN	MMWCA, TPs
Action 2.4: Regulate commercial development through spatial planning compatible to conservation					
2.4.1 Collect baseline data on the current status of commercial development along the highways	**X**			CGN	MMWCA, TPs
2.4.2 Develop and implement spatial development plans for urban centres along the Narok-Sekenani highway	**X**	**X**	**X**	CGN	MMWCA, TPs
Action 2.5: Develop an investment prospectus					
2.5.1 Conduct a survey to identify investment sites and business	**X**			CGN	MMWCA, TPs

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
opportunities (e.g., camping, self-catering facilities, guest houses, hostels etc)					
2.5.2 Prepare a prospectus on investment opportunities in the ecosystem and disseminate it to potential investors	X	X	X	CGN	MMWCA, TPs
Action 2.6: Set up and maintain a facilities database					
2.6.1 Develop and maintain a comprehensive GIS database of tourist facilities in the ecosystem	X	X	X	CGN	MMWCA, TPs
Objective 3: Infrastructure network is well developed and maintained					
Action 3.1: Institute a maintenance programme for roads and airstrips					
3.1.1 Designate all viewing tracks and access roads and close illegal tracks	X	X	X	CGN	MMWCA, TPs
3.1.2 Enforce rules against off road driving in the MMNR	X	X	X	CGN	MMWCA, TPs
3.1.3 Develop a signage format and standard and install signage as appropriate	X	X	X	CGN	MMWCA, TPs
3.1.4 Lobby for development of a road network that connects the Mara ecosystem with Amboseli through Magadi/Loita areas	X	X	X	CGN	MMWCA, TPs
3.1.5 Develop and implement road development and storm water management plans for the reserve and conservancies	X	X	X	CGN	MMWCA, TPs
Action 3.2: Upgrade existing and increase visitor amenities					
3.2.1 Set minimum standards for visitor amenities aligned to international standards for all the visitor amenities	X	X	X	CGN	MMWCA, TPs
3.2.2 Develop visitor amenities (e.g. viewing platforms, bird hides, and mobile restaurants) at migration crossing view points and other observation areas	X	X	X	CGN	MMWCA, TPs
3.2.3 Work with investors to introduce modern recreation facilities such as food and beverage shops	X	X	X	CGN	MMWCA, TPs
3.2.4 Work with investors in the provision of essential services (e.g. basic banking, vehicle hiring services, and vehicle workshops) next to the main entrances like Sekenani and Talek	X	X	X	CGN	MMWCA, TPs
Action 3.3: Identify suitable location/s for tourist information and education centres					
3.3.1 Assess the current information centres and their capacity and decide whether these should be upgraded instead of starting new ones	X			CGN	MMWCA, TPs

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
3.3.2 Assess whether the education and information centres can be combined with the upcoming college of wildlife in Pardamat Conservation Area	X	X	X	CGN	MMWCA, TPs
Action 3.4: Monitor the effects of the upgraded Narok - Sekenani Road					
3.4.1 Monitor development activities along Sekenani road	X	X	X	CGN	MMWCA, TPs
3.4.2 Conduct visitor surveys to gauge visitor perception of the product and services	X	X	X	CGN	MMWCA, TPs
3.4.3 Enforce laws against littering	X	X	X	CGN	MMWCA, TPs
3.4.4 Provide receptacles for litter disposal at strategic locations	X	X	X	CGN	MMWCA, TPs
Objective 4: Marketing strategies are modernised and intensified					
Action 4.1: Develop a distinct brand image for the Mara destination					
4.1.1 Develop a signature brand for the Mara ecosystem and popularize it through campaigns to ensure it acquires public recognition and respect	X	X	X	CGN	MMWCA, TPs
4.1.2 Pursue the designation of Mara as a UNESCO World Heritage Site for added brand value and recognition	X	X		CGN	MMWCA, KWS, NMK
Action 4.2: Establish a common destination marketing platform					
4.2.1 Create a joint marketing secretariat hosted by one of the implementing partners	X	X		CGN	MMWCA, TPs
4.2.2 Establish a joint marketing committee from the major players in the ecosystem		X		CGN	MMWCA, TPs
Develop a Mara ecosystem website primarily for marketing the destination	X	X	X	CGN	MMWCA, TPs
Action 4.3: Conduct regular market research and knowledge management					
4.3.1 Conduct annual visitor satisfaction surveys	X	X	X	CGN	MMWCA, TPs
4.3.2 Designate a specific office to oversee collection and analysis of visitor data					
4.3.3 Share visitor information with relevant tourism stakeholders	X	X	X	CGN	MMWCA, TPs
Action 4.4: Modernize marketing tools and techniques and adopt innovative strategies to capture more market					
4.4.1 Develop an electronic marketing strategy in consultation with the private sector	X	X	X	CGN	MMWCA, TPs
4.4.2 Create and maintain social media accounts (Twitter, Instagram, and Facebook)	X	X	X	CGN	MMWCA, TPs

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
4.4.3 Benchmark with successful marketing campaigns in the private sector tourism entities and seek cooperation and marketing partnerships	X	X	X	CGN	MMWCA, TPs
Action 4.5: Initiate an image management programme					
4.5.1 Develop an ecosystem-wide code of conduct for tourism operators	X			CGN	MMWCA, TPs
4.5.2 Review existing protected are by-laws to ensure they reflect the desired standards	X			CGN	MMWCA, TPs
4.5.3 Enforce of rules and regulations	X	X	X	CGN	MMWCA, TPs
4.5.4 Conduct regular training for the enforcement officers, reserve and conservancy managers to appreciate the importance of enforcing regulations	X	X	X	CGN	MMWCA, TPs
4.5.5 Create awareness on the reserve by-laws through proper and visible signage in all strategic locations	X	X	X	CGN	MMWCA, TPs
4.5.6 Establish a whistle blowing mechanism where visitors can report malpractices anonymously	X	X	X	CGN	MMWCA, TPs
3. COMMUNITY LIVELIHOODS PROGRAMME					
Programme Goal: To enhance community participation in sustainable natural resources management to improve community livelihoods					
Objective 1: Community benefits from conservation enhanced					
Action 1.1: Establish new conservancies and strengthen existing ones					
1.1.1 Mobilise the GMME community in wildlife-rich areas to establish new conservancies.	X	X	X	MMWCA	KWS, CGN, NGOs
1.1.2 Support new conservancies in their official registration processes	X	X	X	MMWCA	KWS, CGN, NGOs
1.1.3 Train conservancy staff in governance, leadership, and communication	X	X	X	MMWCA	KWS, CGN, NGOs
1.1.4 Support conservancies to develop and implement legal structures and policies to ensure transparency and accountability	X	X	X	MMWCA	KWS, CGN, NGOs
1.1.5 Establish a conflict resolution mechanism for mediation of conflicts in conservancies	X	X	X	MMWCA	KWS, CGN, NGOs
1.1.6 Advocate for continued support of the ongoing community scout stimulus package	X	X	X	MMWCA	KWS, CGN, NGOs
1.1.7 Establish a funding mechanism that will support conservancy	X	X	X	MMWCA	KWS, CGN,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
projects through grants and micro-loans.					NGOs
1.1.8 Support conservancies in developing and gazetting their management plans	X	X	X	MMWCA	KWS, CGN, NGOs
Action 1.2: Support community social development projects					
1.2.1 Identify community development needs of different conservancies	X			MMWCA	KWS, CGN, NGOs
1.2.2 Mobilize funds to support social development projects	X	X	X	MMWCA	KWS, CGN, NGOs
1.2.3 Evaluate community projects to discern their effectiveness in improving community support for conservation	X	X	X	MMWCA	KWS, CGN, NGOs
Action 1.3: Promote non-tourism-based income generating activities					
1.3.1 Support the community in identifying and developing natural resource-based enterprises	X	X	X	MMWCA	KWS, CGN, NGOs
1.3.2 Develop viable business and action plans for priority enterprises	X	X	X	MMWCA	KWS, CGN, NGOs
1.3.3 Establish an enterprise-related cooperative society		X		MMWCA	KWS, CGN, NGOs
1.3.4 Provide seed funding to cooperative society members to start their projects		X	X	MMWCA	KWS, CGN, NGOs
1.3.5 Support the community access small grants and micro-loans from partners and micro-finance institutions	X	X	X	MMWCA	KWS, CGN, NGOs
1.3.6 Train community enterprise groups in financial management skills	X	X	X	MMWCA	KWS, CGN, NGOs
Action 1.4: Negotiate long-term leases to cushion conservancies from unpredictable downturns in the tourism industry					
1.4.1 Establish the status of leases in all the conservancies	X			MMWCA	KWS, CGN, NGOs
1.4.2 Support conservancies to sign long-term lease agreements	X			MMWCA	KWS, CGN, NGOs
Action 1.5: Develop carbon credit projects in the GMME					
1.5.1 Work with partners in developing a carbon credit project concept	X	X	X	MMWCA	KWS, CGN, NGOs
1.5.2 Conduct carbon stock assessments at Loita and Nyekweri forests	X	X		MMWCA	KWS, CGN, NGOs

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
1.5.3 Conduct community sensitization meetings to gain community support for the carbon credit projects	X	X		MMWCA	KWS, CGN, NGOs
1.5.4 Conduct community study tours to some of the carbon credit success stories	X	X		MMWCA	KWS, CGN, NGOs
1.5.5 Solicit for carbon credit markets	X	X	X	MMWCA	KWS, CGN, NGOs
Action 1.6: Promote creation of wildlife conservation easements					
1.6.1 Identify and map all migratory routes and corridors and associated resources	X			MMWCA	KWS, CGN, NGOs
1.6.2 Assess land use in unprotected areas and categorise it according to its compatibility with conservation	X			MMWCA	KWS, CGN, NGOs
1.6.3 Sensitize landowners along the identified wildlife corridors on conservation easements	X	X	X	MMWCA	KWS, CGN, NGOs
Action 1.7: Sensitize the community on the Maasai Mara Community Support Fund					
1.7.1 Work with stakeholders to sensitize the community on the purpose of the MMCSF Fund	X	X	X	MMWCA	KWS, CGN, NGOs
1.7.2 Support the community to participate in the identification and implementation of projects at the Ward level	X	X	X	MMWCA	KWS, CGN, NGOs
Objective 2: Conservation education and awareness enhanced					
Action 2.1: Support training of community members in tertiary institutions					
2.1.1 Identify and profile bright and needy students for enlisting in sponsorship programmes	X	X	X	MMWCA	KWS, CGN, NGOs
2.1.2 Enlist corporate support for students from communities adjacent to conservation areas within the GMME	X	X	X	MMWCA	KWS, CGN, NGOs
2.1.3 Create a framework for support partners to periodically meet and share data on student support	X				
2.1.4 Solicit funding from development partners to support needy children	X	X	X	MMWCA	KWS, CGN, NGOs
Action 2.2: Train community members in environmental conservation and tourism through workshops, seminars and short courses					
2.2.1 Organise community workshops and seminars	X	X	X	MMWCA	KWS, CGN,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					NGOs
2.2.2 Organise sponsored education trips to areas undertaking wildlife management with similar conservancy models	X	X	X	MMWCA	KWS, CGN, NGOs
2.2.3 Work with partners in training community scouts	X	X	X	MMWCA	KWS, CGN, NGOs
2.2.4 Develop and implement HWC training programmes	X	X	X	MMWCA	KWS, CGN, NGOs
2.2.5 Integrate conservancy game scouts in the detection and reporting of problem animal incidents to manage HWC	X	X	X	MMWCA	KWS, CGN, NGOs
2.2.6 Conduct participatory conservation planning	X	X	X	MMWCA	KWS, CGN, NGOs
Action 2.3: Create awareness on conservation activities in the GMME among the local community and the general public					
2.3.1 Work with partners in organizing conservation-related activities and events, such as the Mara Day, World Wildlife Day, World Environment Day, World Wetlands Day, among others	X	X	X	MMWCA	KWS, CGN, NGOs
2.3.2 Share conservancies' annual reports and the status of conservation reports with stakeholders	X	X	X	MMWCA	KWS, CGN, NGOs
Objective 3: Human-Wildlife Conflict reduced					
Action 3.1: Build the capacity of KWS staff, community scouts, and community members in conflict mitigation					
3.1.1 Train staff from different institutions in HWC mitigation measures and technologies	X	X	X	KWS	MMWCA. NGOs, CGN
3.1.2 Equip the HWC response teams with suitable HWC tools and equipment	X	X	X	KWS	MMWCA. NGOs, CGN
3.1.3 Facilitate CWCC members selected by the community to attend CWCC meetings and in verifying the accuracy of compensation claims	X	X	X	KWS	MMWCA. NGOs, CGN
3.1.4 Prepare periodic reports on HWC	X	X	X	KWS	MMWCA. NGOs, CGN
3.1.5 Support preparation of national HWC hotspot mapping and organizing the national status of HWC biennially as required by WCMA, 2013	X	X	X	KWS	MMWCA. NGOs, CGN
3.1.6 Develop a HWC Information Management reporting system	X			KWS	MMWCA. NGOs, CGN

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
3.1.7 Work with the local administration to conduct HWC mitigation barazas in identified hotspot areas	X	X	X	KWS	MMWCA. NGOs, CGN
3.1.8 Establish HWC outposts	X	X	X	KWS	MMWCA. NGOs, CGN
Action 3.2: Promote predator-proof Bomas					
3.2.1 Support community members in the installation of predator-proof Bomas and deterrent lights	X	X	X	KWS	MMWCA. NGOs, CGN
Action 3.3: Establish wildlife barriers as appropriate					MMWCA. NGOs, CGN
3.3.1 Develop a detailed fence installation plan for the entire ecosystem	X			KWS	MMWCA. NGOs, CGN
3.3.2 Identify crop-raiding hotspots	X			KWS	MMWCA. NGOs, CGN
3.3.3 Identify the most effective interventions needed to reduce conflict at each hotspot	X	X		KWS	MMWCA. NGOs, CGN
3.3.4 Install wildlife-proof fences	X	X	X	KWS	MMWCA. NGOs, CGN
3.3.5 Establish a fencing technical committee to advise on fence installation and maintenance	X			KWS	MMWCA. NGOs, CGN
3.3.6 Assess the effectiveness of existing fences (e.g. at Munyas)	X			KWS	MMWCA. NGOs, CGN
Action 3.4: Establish and maintain effective outposts in HWC hotspots and provide them with relevant resources					
3.4.1 Develop and equip three (3) additional outposts at Mosiro, Entasekera, and Olokurto	X	X		KWS	MMWCA. NGOs, CGN
3.4.2 Establish and equip scout outposts at Munyas and Olonkoliin to mitigate conflict	X	X		KWS	MMWCA. NGOs, CGN
Action 3.5: Improve effectiveness of the wildlife compensation and consolation schemes					
3.5.1 Organise wildlife compensation meetings as scheduled	X	X	X	KWS	MMWCA. NGOs, CGN
3.5.2 Disburse the consolation funds to the deceased next of kin promptly	X	X	X	KWS	MMWCA. NGOs, CGN
3.5.3 Establish and maintain wildlife consolation schemes	X	X	X	KWS	MMWCA. NGOs, CGN

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
Action 3.6: Work with partners in maintaining a comprehensive HWC database at KWS Narok Station					
3.6.1 Develop standard HWC protocols that will be implemented by all stakeholders	**X**			KWS	MMWCA. NGOs
3.6.2 Collect HWC information through Citizen Science	**X**	**X**	**X**	KWS	MMWCA. NGOs
Action 3.7: Explore different problem animal mitigation tools					
3.7.1 Collar and monitor problem animals to detect when they are close to HWC hotspots	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.7.2 Identify, capture and translocate problem animals	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.7.3 Apply innovative technologies to control potential problem animals	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.7.4 Train the community in the application of HWC mitigation technologies	**X**	**X**	**X**	KWS	MMWCA. NGOs
Action 3.8: Work with partners to develop and implement SAFE system approach					
3.8.1 Empower the community to effectively participate in wildlife conservation and management	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.8.2 Protect wildlife and ensure that it is not causing conflicts	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.8.3 Promote farming systems that are compatible with wildlife conservation	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.8.4 Protect wildlife habitats through a legally anchored spatial plan	**X**	**X**	**X**	KWS	MMWCA. NGOs
3.8.5 Map HWC hotspots, monitor community attitudes, and measure the performance of interventions	**X**	**X**	**X**	KWS	MMWCA. NGOs
Objective 4: Holistic livestock and grasslands management promoted					
Action 4.1: Promote climate resilient livestock feeding strategies					
4.1.1 Support conservancies to develop community-agreed grazing plans	**X**	**X**	**X**	MMWCA	CGN
4.1.2 Establish strong grazing governance structures in new conservancies, and strengthen existing ones	**X**	**X**	**X**	MMWCA	CGN
4.1.3 Promote forage production and livestock feed conservation	**X**	**X**	**X**	MMWCA	CGN
4.1.4 Develop water sources for livestock	**X**	**X**	**X**	MMWCA	CGN
4.1.5 Maintain livestock at the determined carrying capacity of the conservancy	**X**	**X**	**X**	MMWCA	CGN
4.1.6 Promote traditional grazing systems governed by customary norms	**X**	**X**	**X**	MMWCA	CGN
4.1.7 Establish a forage monitoring system	**X**			MMWCA	CGN

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
4.1.8 Disseminate forage availability information to livestock keepers in a timely fashion	X	X	X	MMWCA	CGN
Action 4.2: Promote adoption of improved and adapted livestock breeds					
4.2.1 Identify livestock breeds suitable for different areas	X			MMWCA	CGN
4.2.2 Provide quality climate-resilient bulls and rams to community members	X	X	X	MMWCA	CGN
4.2.3 Provide Artificial Insemination (AI) services to the community	X	X	X	MMWCA	CGN
4.2.4 Work with the CGN Department of Livestock in training local Para-vets in animal health care	X	X	X	MMWCA	CGN
4.2.5 Support Para-vets with vet equipment	X	X	X	MMWCA	CGN
Action 4.3: Control and manage livestock pests and diseases					
4.3.1 Prepare livestock husbandry protocols	X			MMWCA	CGN
4.3.2 Seek endorsement of livestock husbandry protocols from the community	X			MMWCA	CGN
4.3.3 Conduct disease surveillance	X	X	X	MMWCA	CGN
4.3.4 Support vaccination campaigns	X	X	X	MMWCA	CGN
4.3.5 Provide critical veterinary supplies when needed	X	X	X	MMWCA	CGN
Action 4.4: Support livestock trade and value addition				MMWCA	CGN
4.4.1 Support livestock marketing projects	X	X	X	MMWCA	CGN
4.4.2 Construct and maintain sale yards	X	X	X	MMWCA	CGN
4.4.3 Facilitate value addition services	X	X	X	MMWCA	CGN
4.4.4 Facilitate federation of organized producer organizations	X	X	X	MMWCA	CGN
4.4.5 Establish livestock enterprises and associated businesses through professionally developed business plans	X	X	X	MMWCA	CGN
Objective 5: Climate smart agriculture in agropastoralism areas is promoted					
Action 5.1: Support the adoption of Climate Smart Agriculture (CSA)					
5.1.1 Work with the National Drought Management Authority (NDMA) and the Kenya Meteorological Department (KMD) in ensuring timely dissemination of information on early warning weather predictions to farmers	X	X	X	CGN	Farming community
5.1.2 Procure climate smart agriculture tools and equipment and train farmers on their use.	X	X	X	CGN	Farming community

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
5.1.3 Train farmers on climate smart agriculture	X	X	X	CGN	Farming community
Action 5.2: Support production of high nutrient food types					
5.2.1 Conduct demonstrations on production and use of different nutritious food crops that are adapted and suitable to semi-arid areas	X	X	X	CGN	Farming community
5.2.2 Promote fish farming, beekeeping, and poultry production to diversify livelihoods and improve nutrition	X	X	X	CGN	Farming community
Action 5.3: Promote implementation of good agricultural and sustainable land management practices					
5.3.1 Promote rainwater harvesting	X	X	X	CGN	Farming community
5.3.2 Promote Conservation Agriculture principles as a tool for controlling soil erosion, retaining soil moisture and increasing crop production	X	X	X	CGN	Farming community
5.3.3 Conduct extension services on Conservation Agriculture to increase its uptake among farmers	X	X	X	CGN	Farming community
5.3.4 Provide farmers with technical and financial support in sourcing soil and water conservation tools and equipment, and in installing soil and water conservation structures	X	X	X	CGN	Farming community
5.3.5 Conduct agricultural demonstrations on Conservation Agriculture models to educate farmers	X	X	X	CGN	Farming community
5.3.6 Procure and distribute rain water harvesting and water storage facilities to farmers to enhance rain water harvesting	X	X	X	CGN	Farming community
Action 5.4: Promote conservation, processing and value addition of food commodities					
5.4.1 Support farmers with critical post-harvest and value addition technologies	X	X	X	CGN	Farming community
5.4.2 Conduct business to business fora to improve off take	X	X	X	CGN	Farming community
5.4.3 Train farmers in post-harvest storage of different crops as well as value addition	X	X	X	CGN	Farming community
Action 5.5: Support access to appropriate and high-quality farm inputs					
5.5.1 Conduct market research	X	X	X	CGN	Farming community

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
5.5.2 Procure and distribute high-quality farm inputs for high value crop varieties	X	X	X	CGN	Farming community
5.5.3 Conduct demonstrations on the application of the farm inputs	X	X	X	CGN	Farming community
Action 5.6: Promote adoption of Integrated Pest Management (IPM) regimes					
5.6.1 Promote IPM among farmers through Farmer Field Schools, workshops, and radio and TV talks	X	X	X	CGN	Farming community
4. INSTITUTIONAL COLLABORATIONS AND GOVERNANCE PROGRAMME					
Programme Goal: To strengthen capacity, representativeness and collaboration among locally-led institutions to deliver targeted conservation and development actions in the GMME					
Objective 1: Institutional capacity for ecosystem management strengthened					
Action 1.1: Establish and gazette a Plan Implementation Committee (PIC)					
1.1.1 Establish and gazette a PIC	X			MMWCA	KWS, CGN, WRTI
1.1.2 Develop clear terms of reference and a charter to guide PIC operations.	X			MMWCA	KWS, CGN, WRTI
1.1.3 Hold quarterly PIC meetings to review progress in plan implementation	X	X	X	MMWCA	KWS, CGN, WRTI
Action 1.2: Establish a wildlife security coordination hub					
1.2.1 Integrate telecommunication systems of conservation stakeholders to facilitate effective information sharing	X			KWS	MMWCA, CGN
1.2.2 Provide telecommunication equipment to wildlife security partners and train them on their use	X	X	X	KWS	MMWCA, CGN
1.2.3 Develop wildlife security protocols on incident reporting and response	X			KWS	MMWCA, CGN
1.2.4 Organise joint wildlife security operations	X	X	X	KWS	MMWCA, CGN
1.2.5 Establish a joint operations committee comprising wildlife security partners in the GMME	X			KWS	MMWCA, CGN

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
Action 1.3: Establish a GMME Land Trust as a mechanism to keep land within the community					
1.3.1 Sensitize the community on the GMME Land Trust	**X**			MMWCA	CGN
1.3.2 Prepare a deed trust outlining the objectives and constitution of the Trust	**X**			MMWCA	CGN
1.3.3 Develop a concept proposal for funding of the Land Trust	**X**			MMWCA	CGN
1.3.4 Mobilize resources for the Land Trust to enable it to buy land	**X**	**X**	**X**	MMWCA	CGN
Action 1.4: Advocate for national and county government support to wildlife conservancies					
1.4.1 Make a case for the extension of the current National Government's support to existing conservancies	**X**			MMWCA	CGN, KWS
Action 1.5: Promote actions to reduce costs of living with wildlife through a guaranteed minimum return					
1.5.1 Conduct a land valuation study	**X**			MMWCA	WRTI, KWS, CGN
1.5.2 Conduct a cost-benefit analysis of wildlife conservation and other alternative land uses	**X**			MMWCA	WRTI, KWS, CGN
1.5.3 Prescribe the Guaranteed Minimum Return for wildlife and share with the government for validation	**X**			MMWCA	WRTI, KWS, CGN
Action 1.6: Improve forest and water conservation through targeted support to forest conservation, Community Forest Association, and Water Resource Users Associations in the GMME					
1.6.1 Build organizational capacity for CFAs and WRUAs in the ecosystem	**X**	**X**	**X**	MMWCA	CFAs, WRUAs, CGN, KFS, WRA
1.6.2 Support development and implementation of forest and water resource management plans	**X**	**X**	**X**	MMWCA	CFAs, WRUAs, CGN, KFS, WRA
1.6.3 Work with NEMA to conduct periodic inspections on waste disposal by hotels and lodges	**X**	**X**	**X**	MMWCA	NEMA, CGN, TPS
1.6.4 Enforce guidelines against water pollution in the entire Mara river basin				MMWCA	NEMA, CGN, TPS
1.6.5 Liaise with KFS and CGN in raising awareness on the importance of the Mau Forest to the Mara Ecosystem	**X**	**X**	**X**	MMWCA	KFS, CGN

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
1.6.6 Establish incentive projects to conserve Mau Forest	X	X	X	MMWCA	KFS, CGN
Action 1.7: Support the Conservancy Managers' and public consultative forums					
1.7.1 Facilitate quarterly learning and information sharing meetings for Conservancy Managers and Community Liaison Officers	X	X	X	MMWCA	CGN, TPs
1.7.2 Hold quarterly public forums	X	X	X	MMWCA	CGN, TPs
Action 1.8: Accord the GMME international recognition by listing it as a World Heritage Site and as a Man and Biosphere Reserve					
1.8.1 Develop a World Heritage Site nomination dossier for GMME	X			CGN	NMK, KWS, MMWCA
1.8.2 Collaborate with the Kenya National Commission for UNESCO to prepare and submit the relevant nomination documents to UNESCO	X			CGN	NMK, KWS, MMWCA
Objective 2: Sustainable Governance arrangements established and strengthened in the GMME's nonprotected areas					
Action 2.1: Establish a network of community conserved areas on the Loita-Mosiro Ecoregion					
2.1.1 Form community conserved areas along wildlife corridors	X	X	X	MMWCA	KWS, CGN
2.1.2 Establish governance and management structures for community conserved areas	X	X	X	MMWCA	KWS, CGN
2.1.3 Support development and implementation of community conserved areas' management plans	X	X	X	MMWCA	KWS, CGN
Action 2.2: Facilitate establishment of a conservation landscape level body to coordinate conservation action on the Loita-Mosiro area					
2.2.1 Establish an umbrella coordinating body for community conserved areas	X			MMWCA	KWS, CGN
2.2.2 Create community-conserved areas between Olderkesi and Loita forest	X	X	X	MMWCA	KWS, CGN
Action 2.3: Establish an ecosystem level agricultural coordination association					
2.3.1 Assess the representativeness of the existing farmers cooperatives or associations	X			CGN	Farming community
2.3.2 Establish an overall body to represent all farming groups	X			CGN	Farming community

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
2.3.3 Prepare a guide on mainstreaming conservation in farming systems	X			CGN	Farming community
Action 2.4: Identify a partnership to formalize adoption of green centers within the network of community centres					
2.4.1 Form partnerships that promote the development of green centres in the GMME	X	X	X	CGN	MMWCA
2.4.2 Develop land use plans for urban centres	X	X	X	CGN	MMWCA
Action 2.5: Strengthen women and youth inclusion in ecosystem decision making, programs, activities and benefit-sharing					
2.5.1 Develop gender mainstreaming guidelines	X			MMWCA	CGN
2.5.2 Conduct a detailed analysis of gender mainstreaming needs	X			MMWCA	CGN
2.5.3 Conduct a sensitization campaign among the stakeholders on gender mainstreaming	X	X	X	MMWCA	CGN
2.5.3 Train women and youth on all aspects of conservancy management	X	X	X	MMWCA	CGN
5. RESEARCH AND KNOWLEDGE MANAGEMENT PROGRAMME					
Programme Goal: To conduct and coordinate research in the GMME to enable the provision of accurate data and information to support management decision making					
Objective 1: Coordination and compliance with wildlife research protocols enhanced					
Action 1.1: Develop an integrated wildlife data and information system for the GMME					
1.1.1 Develop a digital library	X			WRTI	KWS, OMRH
1.1.2 Develop a biodiversity database	X			WRTI	KWS, OMRH
1.1.3 Develop a digital herbarium	X			WRTI	KWS, OMRH
1.1.4 Design and implement an information management system	X	X	X	WRTI	OMRH
Action 1.2: Coordinate wildlife research conducted by local and international researchers					
1.2.1 Organise research seminars for researchers	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
1.2.2 Prepare and disseminate research newsletters and publications	X	X	X	WRTI	CGN, KWS, MMWCA,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					OMRH
Action 1.3: Organize annual GMME research conferences					
1.3.1 Work with stakeholders to organise an annual research conference for the GMME	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Objective 2: Scientific data and information generated to support planning and decision making					
Action 2.1: Design and implement a long-term ecological monitoring programme					
2.1.1 Design an ecological monitoring programme	**X**			WRTI	CGN, KWS, MMWCA, OMRH
2.1.2 Implement the ecological monitoring programme	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Action 2.2: Conduct research on impacts of key threats to ecosystem sustainability and resilience					
2.2.1 Conduct research on habitat dynamics in the ecosystem	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
2.2.2 Conduct community conservancy governance studies	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Action 2.3: Conduct studies on Human-wildlife Conflicts					
2.3.1 Conduct experimental research on conflict prevention methods	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
2.3.2 Establish systematic monitoring of the effectiveness of HWC interventions	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Action 2.4: Conduct and coordinate bio-prospecting on wildlife resources to enhance resource utilization and help in galvanizing support for conservation					
2.4.1 Conduct continuous bioprospecting missions in the GMME	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					OMRH
Action 2.5: Conduct ecosystem valuation to inform conservation policy decisions					
2.5.1 Conduct an economic valuation of the ecosystem	**X**			WRTI	CGN, KWS, MMWCA, OMRH
2.5.2 Update the economic valuation regularly based on the prevailing socio-economic conditions of the area	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Action 2.6: Provide planning and advisory services					
2.6.1 Support development of protected area and ecosystem plans	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
2.6.2 Support development of species recovery plans	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
2.6.3 Provide technical assistance on Environmental Impact Assessments (EIAs) and Environmental Audits (EAs) of development projects	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Objective 3: Collaborations and partnerships in wildlife research enhanced					
Action 3.1: Establish linkages and collaborations with researchers in the GMME					
3.1.1 Identify the institutions involved in long term research activities in the ecosystem	**X**			WRTI	CGN, KWS, MMWCA, OMRH
3.1.2 Develop an electronic platform to register research activities conducted by different institutions	**X**			WRTI	CGN, KWS, MMWCA, OMRH
3.1.3 Draw collaborative MoUs with the research projects	**X**	**X**	**X**	WRTI	CGN, KWS, MMWCA, OMRH
Action 3.2: Work with "One Mara Research Hub" to improve research coordination and information sharing					
3.2.1 Share research information with OMRH	**X**	**X**	**X**	WRTI	CGN, KWS,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					MMWCA, OMRH
3.2.2 Encourage researchers to share research outputs with the OMRH	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
3.2.3 Involve the OMRH network of researchers in organising the GMME annual research conference, seminars and workshops	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 3.3: Establish partnerships with other research institutions in information exchange and networking to support wildlife conservation and management					
3.3.1 Establish partnerships and cooperate with other research organizations and institutions	X	X	X	WRTI	Research Institutions
3.3.2 Establish Mara research and information system at the research station	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
3.3.3 Identify research needs and gaps in the ecosystem	X			WRTI	CGN, KWS, MMWCA, OMRH
3.3.4 Identify strategic institutions to support long term research projects	X			WRTI	CGN, KWS, MMWCA, OMRH
3.3.5 Develop joint research funding proposals	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 3.4. Conduct collaborative cross-border wildlife censuses				WRTI	
3.4.1 Establish strong collaborative linkages with TAWIRI	X	X	X	WRTI	TAWIRI
3.4.2 Domesticate the Arusha declaration on cross-border wildlife species and habitats management	X	X	X	WRTI	KWS
Action 3.5: Initiate and support a Climate Information Hub (CIH) at the grassroot level					
3.5.1 Train local communities on climate science	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
3.5.2 Recruit staff to manage the hub	X	X	X	WRTI	CGN, KWS,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					MMWCA, OMRH
3.5.3 Disseminate climate information to the local community	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 3.6: Undertake a climate risk and vulnerability assessment for the GMME, and set out priority adaptation actions					
3.6.1 Work with climate researchers to conduct climate risk and vulnerability assessment for the GMME	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 3.7: Integrate indigenous and local knowledge into climate adaptation policies and practices					
3.7.1 Document local knowledge on climate change and its social and economic impacts	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
3.7.2 Identify barriers to incorporating local knowledge into climate science	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Objective 4: The MMRS's capacity to conduct and coordinate wildlife research strengthened					
Action 4.1: Strengthen the MMRS's human resource capacity					
4.1.1 Conduct staff needs assessment	X			WRTI	CGN, KWS, MMWCA, OMRH
4.1.2 Deploy suitable staff at the research station	X			WRTI	CGN, KWS, MMWCA, OMRH
4.1.3 Train staff in relevant skills	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 4.2: Construct and rehabilitate buildings					
4.2.1 Assess requirements for additional office space and residential houses	X			WRTI	CGN, KWS, MMWCA, OMRH
4.2.2 Assess buildings rehabilitation needs	X			WRTI	CGN, KWS,

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
					MMWCA, OMRH
4.2.3 Seek funds to construct and rehabilitate the offices and residential houses	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 4.3: Liaise with WRTI Headquarters in the procurement of field equipment					
4.3.1 Assess the research station's research needs and capacity	X			WRTI	CGN, KWS, MMWCA, OMRH
4.3.2 Identify the priority research equipment for the station	X			WRTI	CGN, KWS, MMWCA, OMRH
4.3.3 Liaise with WRTI headquarters to procure priority equipment	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
4.3.4 Train staff on use and maintenance of the acquired research equipment	X	X	X	WRTI	CGN, KWS, MMWCA, OMRH
Action 4.4: Establish a well-equipped GIS and remote sensing lab					
4.4.1 Benchmark with other research centers on the GIS and remote sensing lab	X			WRTI	OMRH
4.4.2 Identify and procure modern GIS and remote sensing equipment	X	X	X	WRTI	OMRH
4.4.3 Deploy a GIS and remote sensing scientist to run the lab	X			WRTI	OMRH
Action 4.5: Improve the management, operations and resources of the MMRS' veterinary unit					
4.5.1 Conduct an appraisal of vet lab requirements	X			KWS	WRTI, CGN
4.5.2 Develop a funding proposal on the required veterinary resources	X			KWS	WRTI, CGN
4.5.3 Liaise with WRTI Headquarters to solicit for funds to support clinical interventions, disease surveillance and veterinary research	X	X	X	KWS	WRTI, CGN
4.5.4 Assess requirements for a fully functional mobile vet unit	X			KWS	WRTI, CGN
4.5.5 Procure required mobile vet unit equipment	X	X	X	KWS	WRTI, CGN
Action 4.6: Build a holding facility for injured or sick animals during treatment, and problem animals during pre-release confinement					

Goals, Objectives, Actions and activities	Time Frame			Responsibility	
	Short-term (1-3 years)	Medium-term (4-6 years)	Long-term (7-10 years)	Lead Institution	Key partners
4.6.1 Hold consultative meetings to discuss the need for a holding facility in the ecosystem	X			KWS	WRTI, CGN
4.6.2 Identify a suitable location for the facility within the land allocated to MMRS	X			KWS	WRTI, CGN
4.6.3 Raise funds to develop holding facility	X	X	X	KWS	WRTI, CGN
4.6.4 Construct the holding facility		X		KWS	WRTI, CGN
4.6.5 Deploy adequate qualified staff to operate the holding facility	X	X	X	KWS	WRTI, CGN
Action 4.7: Construct better carnivore transport cage and traps					
4.7.1 Benchmark with other leading research stations and national parks on wildlife capture and handling techniques	X			KWS	WRTI, CGN
4.7.2 Identify appropriate specifications for wildlife cages	X			KWS	WRTI
4.7.3 Construct high standard cages	X			KWS	WRTI
Action 4.8: Rehabilitate herbarium and animal species collections					
4.8.1 Conduct a situational analysis of the herbarium to identify gaps in its status	X			WRTI	CGN
4.8.2 Upgrade the herbarium storage facilities	X			WRTI	CGN
4.8.3 Rehabilitate all the herbarium collections for fresh preservation	X			WRTI	CGN
4.8.4 Develop a program for herbarium collection and maintenance	X			WRTI	CGN

Monitoring and Evaluation

It is essential to undertake monitoring and evaluation in order to measure and assess progress in plan implementation, learn from findings and experiences, and decide on what actions to take to achieve better outcomes. Monitoring and Evaluation (M&E) will be a useful mechanism to assist plan implementers track and determine the progress they are collectively making through their individual efforts, and for the GMME Plan Steering Committee to provide oversight on plan implementation in a structured manner. The overall responsibilities for M&E are defined under Table 15 which outlines the roles and responsibilities for various aspects of plan implementation.

The primary responsibility for plan monitoring lies with the implementing organizations, with the Plan Implementation Committee (PIC) coordinating plan monitoring and providing technical oversight to ensure that all implementing agencies have requisite capacity to report on progress in the provided format. The Plan Implementation Coordinator, working under the guidance of the PIC, will be responsible for developing a detailed monitoring plan in collaboration with the implementing agencies.

On the other hand, the primary responsibility for plan evaluation lies with PIC. The PIC will procure services of M&E experts to conduct a mid-term evaluation after five years and final evaluation at the end of the 10-year plan duration. The plan evaluation reports will be shared with the Narok County Assembly for approval of any proposed amendments.

PLAN ANNEXES

Annex 1. Planning Meetings Held

Meeting Type	Dates
1. Plan Scoping Workshop	13-14 October, 2020
2. Planning Launch Event	19 February 2021
3. Information Collation Workshop	19-23 April 2021
4. Core Planning Team Meeting	27 April, 2021
5. CSP-EMP Integration Workshop	22-27 June 2021
6. Stakeholder Planning Workshop	13-14 July 2021
7. Community Livelihood Working Group Workshop	9-13 August 2021
8. Plan drafting workshop #1	13-16 September 2021
9. Plan drafting Workshop #2	30 Sept-3 Oct
10. Experts Plan Review Workshop	4-7 October 2021
11. Presentation of the draft plan to the CEC Member, Department of Tourism and Wildlife	16 November, 2021
12. MMWCA Plan Endorsement meeting	26 January, 2022
13. CGN Cabinet Plan endorsement meeting	11 May, 2022
14. KWS & WRTI Plan Endorsement Meeting	24 May, 2022
15. Narok County Assembly Plan Sensitization Meeting	7 February, 2023
16. Stakeholder Consultative Workshop	17th February, 2023
17. Public Participation Meetings	18th February, 2023

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Annex 2. Stakeholder participation in plan development

Name	Organisation/ Position	Planning Meetings and Events										
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Aggrey Maumo	KWS Hqs	X				X							
Agnes Irungu	MMWCA				X		X						
Agnes Oudo	KWS					X							
Ajuoga Augustine	KWS Warden	X											
Alesandra Macull	Wilderness Governors, COO												X
Alex Nchoko	Spirit of the Mara, Director												X
Alex Nyamasyu	NCA											X	
Alfred Bett	NCG, Tourism Warden												X
Allan Meingati	Meingati & Co., Advocate												X
Amelia Letura	MMWCA, Intern									X			
Amos Kechenye	CGN, Tourism Officer									X			
Amos Mayianen	Journalist	X											
Anastacia Mwaura	KWS, SS	X	X	X	X	X	X	X			X		
Andrew Wamalwa	National Police Service	X											
Angela Sanau	MMWCA, SN Program Officer- Gender							X		X			
Anne Kahihia	KWS	X											
Antony Ketikai	Ilmuran Lentim EcoCamp, Owner												X
Apollo Kariuki	Planning Consultant		X	X	X	X	X	X	X	X	X	X	
Arami Leprie	Member	X											
Auma Hezekiah	NCA											X	
Ben Amollo	MoLPP, PPP									X			
Ben Ololoso	Maasai Moran Conservancy	X											

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCASM	SCW
Benard Leperes	CWCC	X											
Benjamin Koke	Mara Lemek Conservancy, Warden	X				X							
Benson Pion	Mara Hyena Project, Research Assistant												X
Benta Musimya	KWS, Ag. HLS										X		
Bernard Kimeto	CGN							X					
Bernard Ngeno	CGN, Director URBR									X			
Betty Maitoyo	Ag. Chair, KWS BOT	X											
Betty Mugo	USAID							X					
Billy Koronkoso	KWT, Researcher												X
Boniface Chebii	MOTW, LC					X		X		X		X	
Brg.(Rtd) John Waweru	DG, KWS	X											
Brian Kaelo	MPCP					X							
Brian Nyagon	Crocodile Camp, Manager												X
Brian Schuh	MPCP					X							
Calvin Cottars	Cottar Wildlife Trust					X		X					
Camilla Holgersen	MPCP					X							
Caroline Jepchumba	WWI, ASS Planner									X			
Chaka Wana	Naibor Camps, Manager												X
Charles Amenya	MMWCA, M.E.O											X	
Charles Kipess	OCWCT					X							
Charles Lemuso	OMC, Manager	X											
Charles Nampasu	Lemek,LOC	X											
Chief Taki	Area Chief	X											
Cindy Obath	Data Analyst, One Mara Research Hub				X								
Collins Saruni	NCA, PCA											X	X
Daniel Kiari	4x4 Safaris, Owner												X
Daniel Kipeen	Lemek	X				X							

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCASM	SCW
Daniel Muli	MMWCA, SPO												X
Daniel Nampaso	Enonkishu Conservancy					X							
Daniel Njaga	Consultant						X	X					
Daniel Ole Muli	MMWCA							X					
Daniel Ole Sopia	MMWCA	X	X	X		X		X	X	X	X	X	X
Daniel Sururu	Olarro					X							
David K. Ngetick	National Police,CPL	X											
David Keshine	Maasai Moran	X											
David Kinanta	Oloisukut					X							
David Yamo	Senior M&E Officer – MMWCA				X								
Debra Seenei	Cray Mara Journeys, CEO												X
Dennis Kului	Olchoro Oiruowa, Director	X											
Dennis Sonkoi	KWT					X							
Dickson Kerwua	NCG, Senior Warden												X
Dickson Leshan	MMWCA					X							
Dickson Lesimirdana	KWS, Director										X		
Dickson Ole Kaelo	KWCA, CEO	X	X					X	X		X		
Dickson Ritan	KWS, H-WPD		X	X	X		X	X			X		
Dickson Soie	PCA CPL	X											
Dickson Taek	Olerai					X							
Dominic Gannatocas	Wilderness Governors, MD												X
Dominic Kiguyan	Talek youth					X							
Dominic Koya	Naboisho					X							
Dominic Sakat	MPCP					X							
Dominic Yiankere	Base Camp, Guide	X											
Dorcas Gachigi	MMWCA, Executive Assistant									X	X	X	
Doreen Odeck	OMC					X							
Doris Nabaala	OlChoro O.C, Manager	X				X							
Dr. David Mpilei	CGN							X					

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Dr. Elena Chelysteva	MMCP Cheetah Project, Director					X							X
Dr. Fahd M.O Al Guthny	MoTW, PM					X	X	X					
Dr. Gilbert Ouma	UoN							X					
Dr. Mohammed Said	UoN/OMRH				X	X	X	X					
Dr. Patrick Omondi	Director, WRTI	X		X							X	X	
Edward Keringot	Unbounded Paradise, Manager												X
Emily Kariankei	Member	X											
Emmanuel Kinayia	MMNR					X							
Erastus Mutuku	CGN, ADPP					X				X			
Eric Reson	MMWCA, Programme Officer		X	X	X			X	X	X	X	X	
Esther Mbaire	NCA, CA											X	
Eunice Salau	CGN, CO Lands									X			
Evan Lempaka	NGG					X							
Evans Kamethe	Media Cameraman	X											
Evans Muriithi	WRTI					X							
Evans Nchoe	Olarro LOC					X							
Evans Ongere	CGN, PA									X			
Evans Sitati	Mara Siana					X							
Everlyne Koryan	CGN					X							
Ezekiel Ronoh	CGN, CECM									X			
Faho M.O. Al-Guthmy	MOTW												
Faith Kereto	Member	X											
Felister Nailantei	CGN					X							
Fowin Saware	T.Y.A.					X							
Francis Nkoitoi	MMWCA/ KWCA					X		X					
Francis Pengo	Mara Triangle Watch, S/W												X
Francis Rarin	OOC, K												X

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Francis Sopia	CPM					X							
Francis Tinka	Lemek LOC	X											
Fred Koriata	Mara Isinya					X							
Garry Holmes	Balloon Safaris, Chief Pilot												X
George Supayo	CGN, CECM-Trade					X				X			
Gideon Kimai	Mara Rafiki, Guide												X
Gideon Pesi	PCA CLO	X											
Gladys Kosgei	KWS, H-WPD										X		
Grace Osoi	Sekenani Camp, Manager												X
Gregory Wabuge	Mara Explorer, GM												X
Hassan Bashir	KWS, PADG										X		
Hellen Sairowua		X											
Hon. Alice Nanana	NCA, MCA												X
Hon. Angela Tompo	NCA, MCA												X
Hon. Cariline Mayianoi	NCA, MCA												X
Hon. Chepkwony Kipng'eno	NCA, MCA											X	X
Hon. Lemiso Kimiti	NCA, MCA											X	X
Hon. Lewa Marintat	NCA, MCA												X
Hon. Lewiso Kimiti	NCA, MCA											X	
Hon. Lynda Ntutu	NCA, MCA											X	
Hon. Margaret Nenkai	NCA, MCA											X	
Hon. Maria Kiserian	NCA, MCA											X	
Hon. Maria Meriki	NCA, MCA											X	X
Hon. Mercy Keiwua	NCA, MCA												X
Hon. Michael Sere	NCA, MCA											X	
Hon. Moses Sikona	NCA, MCA											X	X
Hon. Najib Balala	CS, MoTW	X											
Hon. Narana Alice	NCA, MCA											X	
Hon. Nenkai Mag	NCA, MCA											X	

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Hon. Salaoh Kisutu	NCA, MCA												X
Hon. Sangau	NCA, MCA											X	X
Hon. Seme	NCA, MCA												X
Hon. Solian Dikkir	NCA, Speaker											X	
Hon. Sonkoi Lemein	NCA, MCA												X
Hon. Soroko Henry	NCA, MCA											X	
Hon. Stephen Koech	NCA, MCA												X
Hon. Syntei Nchoe	NCA, MCA												X
Hon. Timothy Mako	NCA, MCA												X
Hope Nyangubo	KWS, CCO										X	X	
Ibrahim Logielan	NCA											X	
Irene Amoke	KWT		X	X				X					
Isaac Kukunge	Member	X											
Ishmael Nkukuu	Mt. Suswa Conservancy					X							
Ismael Kiprop	KWS					X		X					
Ismail Keremoglu	Balloon Safaris, Pilot												X
J Koilekei	Mara Simba, GM												X
Jack Marubu	TNC, Program Coordinator		X										
Jackson Mpario	MMWCA, Chair Conservancies								X	X	X	X	X
Jackson Ntaiya	SAA											X	
Jackson Sasine	Pardamat Conservancy					X							
Jacob	Siligi Camp, K Director												X
Jake Wall	Mara Elephant Project, Director Research Conservation							X					X
James	Camp, Manager												X
James Kilel	KWS		X	X									
James Kisurkat	Governor's Camp Staff	X											
James Maaisin Sadera	MMWCA	X											
James Mpusia	Ole Motorogi Conservancy	X				X							

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
James Ngeri	NCA, SAA											X	
James Sindiyo	CGN, Chief Warden		X	X	X								
Jane Sainko	Member	X											
Jane Wamboi	KWS								X				
Jason													X
Jennifer Kipees	Olderkesi Conservancy					X							
Job Kijiapi	CGN, CEC- Water					X				X			
Joel Muia	Sweet Acacia Lodge, Manager												X
Joseph Maloyo	M. Enkajang, Owner												X
Johana Cheruiyot	CGN, CECM- Roads									X			
John Miyoni	PST	X											
John Saiyalel	OOC, Liaison Officer	X											
John Sangare	CGN, GIS Officer									X			
John Segeng	MMWCA					X							
John Sopia	Member	X											
Johnson Pesa	MMWCA					X							
Johnson Sipitiek	CGN, CEC Tourism and Wildlife											X	X
Johnson Sopia	Member	X											
Jonathan Kasaine	Member Manager	X											
Jonathan Munka	Sentinel, Ass. Manager												X
Jonathan Sopia	GMM					X							
Josepg Lengeny	NCA, Clerk											X	
Joseph Boinnet	CAS, MoTW	X											
Joseph Kialo	CGN, CECM- Tourism and Wildlife									X			
Joseph Kisila	CGN					X							
Joseph Lengeng	NCA, Clerk											X	X
Joseph Silantoi	Ewangan CBO, Member												X
Joshua Wanyama	LGT							X					

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Julius Sengeny		X											
Jully Senteu	KWT		X	X	X								
Justus Tiale	NCA											X	
Karsis Naimade	MMWCA Staff	X											
Keith Vincent	Wilderness Governors, CEO												X
Kerono Labiti	Fig Tree Camp, Manager												X
Kiamet	Maasai Moran	X											
Kilesi Sayiaton	Lenkuada, Owner												X
Kimemia Migwe	CGN, Legal Counsel									X			
Kioko Osono	MMWCA, Security	X											
Koiyan Everlyne	CGN, CECM									X			
Lawrence Mbelati	MMWCA, LA	X	X	X	X	X		X	X				
Leah Njeri	SNV							X					
Lemejoyio	Member	X											
Lepada Kandori	Maasai Moran	X											
Lepekes Kitipa	MWC, CLO	X											
Leperes Joseph	Mara North					X							
Lillian Ajuoga	KWS, AD										X		
Linus Ngirimo	CGN, CO- Tourism									X			
Lucas Kudate	NCA, MCA												X
Lukapari Cicilia	CGN, CECM									X			
Lynda Ntutu	NCA, MCA												X
Madam Kipeen	Women's forum Chairlady	X											
Maitai Daniel	Talek Youth					X							
Maiwa	Member	X											
Mandela Salim	Olerai					X							
Marampei Kupai	Member Land owner	X											
Marion Muraa	CGN, Legal Counsel									X			

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Mark Karbolo	Odorkesi Conservancy					X							
Martin Twala	KEPA					X							
Maureen Keiwua	Finance and Operations Assistant – MMWCA				X								
Maureen Willson Holmes	Balloon Safaris, Office												X
Mchesousu Meruin	Hot Air Balloons, Sales and Office												X
Melirio Noosaron		X											
Melva Sadesa	Member	X											
Miko Korio	MMWCA Staff	X											
Mohammed Said	Independent Consultant				X	X		X					
Mohanjeet Brar	Porini Camps							X					
Morris Nabaala	KGS	X						X					
Moses Karia	Emotoroki Chairman	X				X							
Moses Kawa Motong													X
Moses Ketuiyo	NCA, CO											X	
Moses Lemaiyan	MMWCA, S.C.O.											X	
Mpaegenay Sawamwala	Nashulai Conservancy					X							
Munkasio Jenko	Isaaten Conservancy					X							
Mustapa Ntutu	Olchoro Oirouwa Director	X											
Muyeyia Sammy	Ministry of Land and Urban Planning				X								
Nagut Reuben	MMC					X							
Nalotoesha Mukenye	Member	X											
Naraswa Tago	Member	X											
Nariku Nkera Nchoe	Member	X											
Naropil Sadera	MNC	X											
Nasieku Sairowua	Member	X											

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Nelson Ole Reiyia	Ololarpote Nashulai, CEO												X
Newton Mbama	CGN					X							
Nicholas Murero	NCMRN, Chairman												X
Nickson Mutai	NCA											X	
Nickson Mutoi	NCA											X	
Niels Mogensen	KWT/MPCP					X							
Nkumuna Joseph*	OlKinyei Conservancy, Director												X
Noonkuta Morjoi	Member	X											
Noorkisaruni Sengeni	Member	X											
Ntiwal Kirio	Member Committee Mara North	X											
Ole Mujio	Rikero	X											
Ole Parmuat	Member	X											
Ole Sikona	Member	X											
Ole Taki	Member	X											
Osewe Vincent	CGN, SADPP									X			
Patita Nabaala	Lemek , Member	X											
Patrick Koya	Talek					X							
Patrick Ololoinirio	Mara North, Loc Member	X											
Patrick Warimu	MMWCA COO		X										
Peter Lenkume	PCA Cpr	X											
Peter Lokitela	GIZ, C&BDA							X		X			
Peter Maina	WRTI, GIS		X	X			X	X			X		
Peter Nausori	Sweet Acacia Camp, Shareholder												X
Peter Sankai	Isaaten Conservancy					X							
Peter Thyson	Sentinel Mara Camp, Director												X
Philip Ngeny	KWS					X	X						
Philip Tinka	Lemek, Member	X											

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCA SM	SCW
Phoebe Nadupoi	MMWCA, Chief Comms & Fundraising Officer				X	X				X	X		
Raphael Kereto	MNC Community Officer	X											
Rebekah Karimi	Enonkisho					X							
Richard Chepkwony	Senior Warden, Narok				X	X	X	X				X	
Richard Markham	*Safaris, CEO												X
Robert Mukenye	Maasai Moran	X											
Robert Nabaala	Lemek Secretary	X											
Robert Saitoti	MMWCA, Intern									X			
Robert Sankale	MMWCA, Programme Assistant									X			
Rosebell Abwonji	MMWCA Operating officer	X	X	X									
Saidimu Rabalo	CGN, Tourism									X			
Saitoti Silantoi	MPCP					X							
Sakayo Naeiku	MEP Assistant Warden	X											
Salome Gachago	KWS							X					
Sammy Mpusia	Ol Kinyei Conservancy					X							
Samson Kasikua	CGN					X							
Samson Lenjirr	WWF-Kenya							X				X	
Samson Silantoi	Loita/ CWCC					X							
Samuel Kararei	Mara Siane*, Finance & Admin												X
Samuel Leposo	CGN, Chief Officer	X	X	X	X	X	X	X		X		X	X
Samuel Malaba	NCA											X	
Samuel Tinka	Lemek, LOC	X											
Samwel Naikada	CWCC					X							
Sankei Fintan	MEP					X							
Sarah Omusula	Gamewatchers Porini, Camp					X							

Name	Organisation/ Position	Planning Meetings and Events											
		PL	PSM	CPTM	IW	SPW	PD	EWG	PEM #1	PEM #2	PEM #3	NCASM	SCW
Saul Ogingo	Kenya Police	X											
Segeton Taek	Talek youth					X							
Seleva Ronko	Member Land owner	X											
Seleyian Partoip	Administration assistant – KWT				X								
Shadrack Ngene	WRTI, PRS										X		
Sharon Mpario	MMWCA, Program Officer Gender									X		X	
Sianto Sikawa	CGN,Tourism Promotion Coordinator		X	X									
Sikona Janet	MMWCA					X							
Simon Nkoitoi	OlKinyei Conservancy	X				X							
Simore Karkar	PCA, CPR	X											
Siro Abdalla	GIS Analyst, WWF-Kenya				X								
Solomon Kyalo	KWS, HCSP										X		
Solomon Mpatiany	Olderkesi Conservancy					X							
Sophie Kisemei	Base Camp, Guide	X											
Stanley Konata	CGN, MM									X			
Stephen Mwiu Ndambuki	WRTI		X	X	X		X	X			X	X	
Thomas Muema	Nashulai Conservancy					X							
Tiama Kipeen	Member	X											
Timony Mako	NCA, MCA											X	
Titus Musungu	Ministry of Transport, Infrastructure, Housing, Urban development and Public Works				X								
Titus Ndolo	MoTW, Admin									X			
Tom Kanwaro	Ashnil, Chairman OlKeju Rongai												X
Tonkoino Ole Nkoiiti	Member	X											
Valery Super	Emboo, Owner												X

Name	Organisation/ Position	Planning Meetings and Events											
		PL	*PSM*	*CPTM*	*IW*	*SPW*	*PD*	*EWG*	*PEM #1*	*PEM #2*	*PEM #3*	*NCASM*	*SCW*
Victor Tuya	NCA											X	
Virginia Nyauma	MMWCA				X	X							
Vivian Sereti	CGN, CECM-Lands					X	X	X		X			
Wanjiru Mwangi	SNV							X					
Warden Ngotiek	NCG, Game Warden I												X
William Carr-Harltey	Sangalai Ltd., MD												X
William Kipetu	Mara North, Manager	X											
William Muli	MMWCA, SFA		X	X	X								
William Musekenya	NCA, Clerk Assistant											X	X
William Naurori	Member, Area Chief	X											
William Sankau	MMWCA, SFA									X	X	X	
Willy Loiser	NCG, CCO												X
Wilson Pubei	Suswa Conservation Area, Chairman	X											
Wilson Sairowua	MEP		X			X	X	X					
Wycliffe Nyanducha	MOTW					X							
Zachary Maritim	WWF, Spatial Planner									X		X	

Key

PL-Planning Launch; **PSM**-Plan Scoping meeting; **CPTM**-Core Planning Team Meeting; **IW**- CSP-EMP Integration Workshop; **SPW**-Stakeholder Planning Workshop; **PD**-Plan drafting Meeting; **EWG**-Expert Working Group Meeting; **PEM**-Plan Endorsement Meeting; **NCASM**-Narok County Assembly Sensitization Meeting; **SCM**-Stakeholder Consultative Workshop

Annex 3. Notice to the Public and other Stakeholders to Submit their Views on the GMME Management Plan

The Standard, 10th February 2023

NAROK COUNTY ASSEMBLY

THIRD ASSEMBLY –SECOND SESSION

NOTICE TO MEMBERS OF THE PUBLIC AND OTHER STAKEHOLDERS TO SUBMIT VIEWS AND MEMORANDA ON THE MAASAI MARA MANAGEMENT PLAN 2023-2033, THE GREATER MARA ECOSYSTEM MANAGEMENT PLAN, AND THE NAROK COUNTY PHYSICAL AND LAND USE DEVELOPMENT PLAN 2022-2032

Pursuant to Article 196(1) (b) of the Constitution of Kenya, the Narok County Assembly Standing Orders and the County Government Act 2012, the Narok County Assembly Joint Committees of Tourism, Culture, and Wildlife Committee together with the Physical Planning, Lands, Trade and Cooperatives Development Committee invites Members of the public and other stakeholders on **Saturday the 18th Day of February, 2023** from 10:00 A.M to give their views on **the Maasai Mara Management Plan 2023-2033, The Greater Mara Ecosystem Management Plan, and the Narok County Physical and Land Use Development Plan 2022-2032**.

The meetings will be held at the venues indicated below:

NO	Sub-County	Ward	Venue
1.	Narok North	Narok Town Ward	Youth Empowerment Centre
2.	Narok West	Siana Ward	Sekenani Trading Centre
3.	Emurua Dikirr	Ilkerin Ward	Dikirr Catholic Church
4.	Kilgoris	Shankoe Ward	Kilgoris Town Hall
5.	Narok South	Ololulung'a Ward	Ololulung'a Trading Centre
6.	Narok East	Nairaig'ie Enkare Ward	Nairaig'ie Enkare Trading Centre

N/B; the General public is however notified of a consultative meeting with Stakeholders and Partners on 17th of February 2023, at Keekokok Lodges from 10:00 am.

Members of the public and other stakeholders can send their views or memorandum on or before **21st of February, 2023** by email to **info@narokassembly.or.ke** or by hand delivery to:

The Clerk,
Narok County Assembly,
P.O BOX 19-20500
Narok

Joseph K. Lengeny
Ag. Clerk,
Narok County Assembly

Annex 4. CGN Plan Approval Certificate

CERTIFICATION

Certificate: I certify that the Greater Maasai Ecosystem Management Plan 2023 - 2032 has been prepared as per the Wildlife Conservation and Management Act, 2013 and County Government Act, 2012

Approved by

Order paper No .....034..... Date .....21/2/2023.....

Sign ..... Date 21/2/2023.....

Hon. Davis Solfa Dikir

Speaker, Narok County Assembly

Endorsed by

Sign ..... Date 21/2/2023

H. E. Patrick Keturet Ole Ntutu

Governor, Narok County Government

The Governor
County Government of Narok
P.O. Box 898-20500
NAROK
Tel: +254 (020) 268 8929/03
Email: info@narok.go.ke

The Chief Executive Officer
Maasai Mara Wildlife
Conservancies Association
P.O. Box 984-20500
NAROK
Tel: +254 (0)715047047
Email: contact@maraconservancies.org

The Director General
Kenya Wildlife Service
P.O. Box 40241-00200
NAIROBI
Tel: +254 (020) 6000800/6002345
Email: kws@kws.go.ke

The Director
Wildlife Research and Training Institute
P.O. Box 842-20117
NAIVASHA
Tel: (+254) 0700 000 321
/0731 919 465
Email: wrti@wrti.go.ke