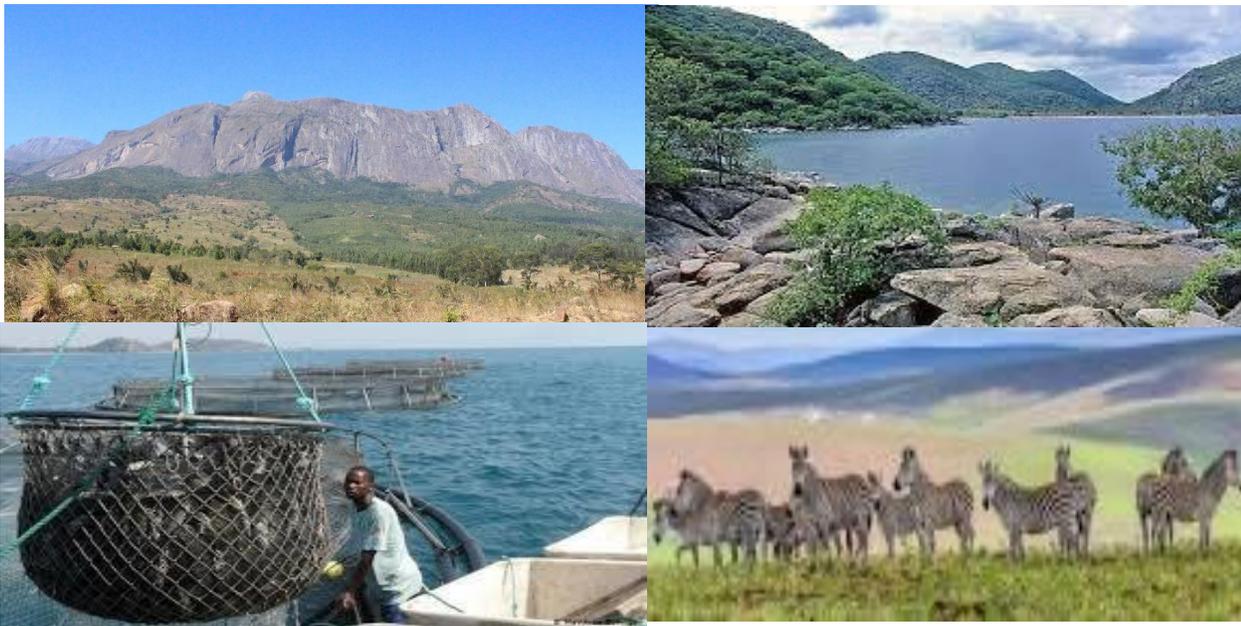


MALAWI NATIONAL ECOSYSTEM ASSESSMENT

SCOPING REPORT



Disclaimer

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ABBREVIATIONS AND ACRONYMS

BAU	Business as Usual
BES-Net	Biodiversity and Ecosystem Services Network
BIOFIN	Biodiversity Finance Initiative
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species.
FDG	Focus Group Discussion
FPIC	Free, Prior, Informed Consent
GDP	Gross Domestic Product
GESI	Gender Equality and Social Inclusion
GIS	Geographic Information System
ILK	Indigenous and Local Knowledge
INDC	Intended Nationally Determined Contribution
IPBES	Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Assessment Services
IPPC	International Plant Protection Convention
LUANAR	Lilongwe University of Agriculture and Natural Resources
MEAs	Multilateral Environmental Agreements
NAP	National Adaptation Plan
NBSAP	National Biodiversity Strategy and Action Plan
NEA	National Ecosystem Assessment
NFLRS	National Forest Landscape Restoration Strategy
NGOs	Non-governmental Organizations
PA	Protected Area
SEM	Sustainable Ecosystem Management
TORs	Terms of Reference
TWG	Technical Working Group

UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Programme
UNEP-WCMC	United Nations Environment Programme World Conservation Monitoring Centre
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change

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EXECUTIVE SUMMARY

Many sectors in Malawi rely on biodiversity and ecosystem services and these include but not limited to agriculture, forest resources, fisheries, water transport, tourism, and energy – all of which significantly contribute to poverty reduction and sustainable development. Millions of rural Malawians who constitute about 85% of the population also rely on biodiversity and ecosystems for their livelihoods. Continued loss of biodiversity and ecosystems consequently results in the loss of irreplaceable functions with cascading impacts on the national economy, food security, household incomes, and social cohesion. In order to prevent this, government officials and other decision-makers need to have access to information about biodiversity that helps them to understand the potential impacts of the decisions that they are taking.

National conservation goals are yet at the bottom of government priorities, and this is despite their significance, particularly to the livelihoods of the most vulnerable and poor segment of society. Women, youths, and people with disabilities shoulder the unintended consequences of the deteriorating condition of ecosystems and landscapes. A report by the World Bank established that 90% of women above the age of 15 years are reliant on natural resources (i.e., biodiversity and ecosystem services) for domestic activities (e.g., collecting firewood, fetching water, and wild fruits for home consumption) in comparison to 24% of men. The report further established that about 24% of households in the country are headed by women such that when these resources are scarce, households are disproportionately affected and more likely to fall into the poverty trap. The information on the dependency of households and the benefits they generate from different types of ecosystems is often missing for proper programming and careful consideration for gender equality and social inclusion.

Malawi is signatory to many international environmental conventions and treaties which have reporting requirements. These include but not limited to the Convention on Biological Diversity; the Framework Convention on Climate Change (UNFCCC); UN Convention to Combat Desertification (UNCCD); International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA); The Ramsar Convention on Wetlands of International Importance; UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage; Convention on the Conservation of Migratory Species of Wild Animals; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and the African Convention on Conservation of Nature and Natural Resources. This wide range of conventions and treaties require periodical reporting which is enormously huge calling for continuous and systematic assessments and monitoring.

Malawi decided to embark on the process of national ecosystem assessment at scale realizing the vital role the assessment will play in the country's obligation to fulfill the reporting obligations and further contribute to influencing decision-making in various development instruments such as national policies and plans and sector-specific policies, i.e., agriculture, fisheries, forestry and national parks and wildlife. The National Ecosystem Assessment (NEA) is an expert evaluation of knowledge on drivers, impacts and responses

to changes in biodiversity and ecosystem services focused on addressing key policy questions by synthesizing available information, identifying knowledge gaps integrating a range of knowledge types to ensure its uptake, ensuring it is credible, legitimate and relevant to national conservation aspirations. The Malawi NEA prioritized three different ecosystem types namely; Aquatic, Terrestrial and Wetlands. Besides other important roles, the NEA is strengthening in-country science-policy-practitioner networks and building capacities of the assessment team and stakeholders during the scoping stage of the process.

This Scoping report was developed taking as a basis of information and data through a stakeholders' and knowledge holders' engagement process that has generated important policy questions for the evaluation stage of the assessment to address. The Scoping stage adopted and followed IPBES's guidelines-based framework and the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC)'s guidance. Based on the framework, the assessment team undertook several activities including (i) launch of the NEA process (ii) establishment of Technical Working Groups (TWGs) and the National Biodiversity Platform (iii) collaborative identification and prioritization of ecosystem types for assessment at national level (iii) development of Terms of Reference (ToRs) to guide the TWGs (iv) community consultations through regional framing workshops and dialogues with Indigenous and local knowledge (ILK) holders and (iv) national scoping report validation workshop through a triologue methodology involving policymakers, scientists and ILK holders.

During the expert evaluation stage, the assessment team will still adopt the Intergovernmental Science-Policy Platform for Biodiversity and Ecosystem Services (IPBES) conceptual framework to capture an integrated view of the biodiversity knowledge policy interface to stimulate new thinking, accommodate diverse human perceptions of biodiversity, for effective and useful engagement of a wide range of stakeholders. The main aim of the expert evaluation stage is to synthesize, analyze, and review scientific and other knowledge, including indigenous and local knowledge. It will also help to understand the trends, conservation and sustainable use of biodiversity and ecosystem services, human well-being, and the linkages with sustainable development. The expert evaluation will examine six interlinked elements constituting a social-ecological system that operates at various scales in time and space: (i) nature; (ii) nature's contributions to people; (iii) anthropogenic assets; (iv) institutions and governance systems and other indirect drivers of change; (iv) direct drivers of change; and (vi) good quality of life.

Specifically, the expert evaluation will seek to address the following broader policy questions:

- (i) How do the biodiversity and ecosystem services provided by wetlands, lakes and rivers, forests, woodlands, national parks, and wildlife reserves across the country contribute to the country's economy, local livelihoods, food security, and good quality of life, and what are their interdependences with each other?

- (ii) How do biodiversity and ecosystem governance including the use of scientific, Indigenous, and local knowledge interact to influence policy and decision-making processes?
- (iii) What are the status, trends, and potential future dynamics of aquatic, terrestrial, and wetland biodiversity and ecosystem services, and what are the pressures that affect their contributions to the country's economy, livelihoods, and well-being in the various regions in the country?
- (iv) What are the actual and potential impacts of various policies and interventions on the contribution of biodiversity and ecosystem functions and services to the sustainability of the national economy, local livelihoods, food security, and good quality of life in the country?
- (v) What knowledge gaps exist to better understand and assess drivers, impacts, and responses to wetland, aquatic and terrestrial biodiversity, and ecosystem services at the national level?

The expert evaluation methods have been informed by the outcome of the scoping stage which echoed the call for interdisciplinary and transdisciplinary subsection of the evaluation process. The scoping process has laid imperatives for solutions to challenges facing biodiversity and ecosystem services with shared responsibility and cooperation with local people, the private sector, non-governmental organizations (NGOs) and civil society organizations for knowledge co-production. Conventional approaches that pay limited attention to stakeholders' varied interests have registered unsatisfactory results. Men and women, children, and the elderly are differently affected by the ongoing forms of biodiversity loss and ecosystem degradation. The information and knowledge about the degree of impact across segments of society are often masked.

To address these policy questions, the expert evaluation stage of the assessment has planned to employ a comprehensive synthesis of available information through deskwork and continued technical stakeholders and knowledge holders' engagements. Stakeholder and knowledge holders consultations and workshops will involve experts from various fields including but not limited to natural science, economist, social scientists, geographic information system (GIS) experts, but will engage Indigenous and local knowledge holders. The inclusion of experts from natural resources-based sectors such as agriculture, forestry, fisheries, and water in the technical working groups will be done purposefully to enhance access to available publications and reports from their sectors. Available national websites relevant to biodiversity such as the Biodiversity Information Facility, Clearing House Mechanism (under development), and the country page on Biodiversity Financing Initiative (BIOFIN) will also provide the required data and knowledge on biodiversity.

Data and knowledge gaps will be identified with reference to the prioritized key policy questions for each of the ecosystem types under the assessment. Where the available data is deemed insufficient or absent to address the key policy questions – this will serve as an indicator for data or knowledge gap. All data and knowledge gaps will be reported as such and recommendations for future research will be made appropriately.

Besides understanding the current state of biodiversity and ecosystem services, projection of future trends based on scenarios and models will be integral to the expert evaluation stage. The period from the past to the present will be assessed for trends or single scenario, while the period from today to the future will be assessed in two different scenarios i.e., Business as Usual (BAU) and Sustainable Ecosystem Management (SEM) scenarios. The length of the past period will vary depending on the availability of information. The next period will be forecast for all ecosystem types until 2050. Scenario development will proceed in the NEA process as a useful approach to creating awareness, articulating and searching for feasible solutions to the challenges of governing ecosystem services addressed earlier in each thematic areas of the assessment. The approach to building scenarios will originate from both models and stakeholder participation, to assess outcomes from alternative future trajectories, through model analysis and planning with stakeholders, to inform decision making. The degree of stakeholder involvement in scenario planning will range from roles with information input (consulting) to mutual process design (co-development).

Indigenous Peoples and local communities have in-depth knowledge of their environments. They are key actors in biodiversity conservation and are being directly impacted by the degradation of ecosystems. Environmental-related policies can have a direct impact on communities and their livelihoods. However, these set of communities and their in-depth knowledge of conservation are often excluded from decision-making processes. The NEA process is working towards amplifying the unique voices, perspectives, and contributions of Indigenous peoples and local communities to make better decisions for the conservation of biodiversity and ecosystem services. The NEA scoping exercise has immensely benefitted from community stakeholder consultations to gather ILK information. A technical working group on ILK has been formulated which will be working across all three thematic chapters (aquatic, terrestrial, and wetlands ecosystems). Gender mainstreaming and women's empowerment are critical to achieving biodiversity and ecosystem services conservation objectives. Gender-responsive environmental policies and planning can deliver multiple benefits for women and biodiversity.

Women and girls have a high potential to lead knowledge production and implementation of the solutions on the ground. For instance, the scoping exercise has revealed that women and girls from indigenous local communities have a high potential to lead and hold a distinctive set of capacities and practices due to their special relationship with nature. This makes them unique knowledge holders mostly needed in the assessment. NEA recognizes the contribution of all gender groups especially women and girls at all levels of the assessment. The expert evaluation report will then recognize and include acknowledged forms and contributions from all genders.

Malawi recognizes that undertaking the NEA process demands requisite and multifaceted skills and knowledge. The NEA country team has identified several areas for capacity building. In collaboration with both local and international partners including the UNEP-WCMC, the United Nations Development Program (UNDP), and the United Nations Educational, Scientific and Cultural Organization (UNESCO), technical working group of

the assessment will be trained to enhance their skills in preparation for the expert evaluation process. Some of the capacity needs include (i) technical report writing (ii) scenario-building methods (iii) ILK methods and integration (iv) systematic literature review – methods and approaches.

CHAPTER 1 – INTRODUCTION

1.1. Rationale for the Assessment

Malawi's economy is partly contingent upon biodiversity and ecosystem services although they are quickly succumbing to complex social, economic, and ecological pressures across all landscapes. Many sectors that contribute to the country's gross domestic product (GDP) rely on biodiversity and ecosystem services and these include but not limited to agriculture, fisheries, forest resources, tourism, and energy. Millions of rural Malawians who constitute about 85% of the population rely on biodiversity and ecosystems for their livelihoods. Continued loss of biodiversity and ecosystem services means the loss of irreplaceable functions with cascading impacts on food security, household incomes and social cohesion. Unfortunately, as the country's population stands at 18 million, conservation goals are given less priority, yet women, children and the most vulnerable groups in the society shoulder the consequences.

Majority of women in Malawi are informally employed in ecosystem related sectors, and their livelihoods and food security at household level are more likely to be adversely affected. A report by the World Bank established that 90% of women above the age of 15 are reliant on natural resources (i.e., biodiversity and ecosystem services) for domestic activities (e.g., collecting firewood, fetching water, and wild fruits for home consumption) in comparison to 24% of men. The report further established that, about 24% of households in the country are headed by women such that when these resources are scarce, households are disproportionately affected and more likely to fall into the poverty trap¹. Conservation schemes that overlook the harsh realities facing women and children are therefore unlikely to achieve greater outcomes. The information on dependency of households and the benefits they generate from different types of ecosystems is often missing for proper programming and careful consideration for gender equality and social inclusion (GESI).

Malawi decided to join other countries of the world embarking on the process of national ecosystem assessment at scale realizing the vital role the assessment will play in influencing decision-making pursuance of better management of the country's biodiversity and ecosystems. By design, the national ecosystem assessment (NEA) takes an inclusive approach and incorporates various kinds of knowledge systems including scientific, Indigenous and local knowledge. The country needs credible and robust information from knowledge of these sources especially when competing demands for land use continue growing. For example, biodiversity conservation vs oil drilling on Lake Malawi, mineral mining vs wildlife conservation in national parks. The NEA is a social process that will highlight trade-offs between decision options in these down-to-earth dilemmas. The NEA report will equip decision-makers with the continually improved evidence they need to choose the right course of action and secure

¹ World Bank. 2015. The Cost of the Gender Gap in Agricultural Productivity in Malawi, Tanzania, and Uganda.

investments pinpointing the need for actions to work in harmony with national development strategies and the Sustainable Development Goals.

Malawi is vulnerable to the impacts of climate change and extreme weather events such as floods and droughts, and the urgency for climate action resonates in many national documents with imperatives for data and information needs. The designing of ecosystem-based adaptation to climate change as propagated in the Updated Nationally Intended Contributions (GoM, 2021)², and the formulation of the National Adaptation Plan (NAP) cannot materialize in the absence of relevant pieces of information about status, trends, and distribution of ecosystem types and their drivers of change. Currently, such kind of information is scattered in sectoral ministries and departments making it more difficult to discern the overall country picture and changes over time and space. Nature-based solutions to climate change, include allowing natural forests to regrow, restoring wetlands, and restocking. There are ongoing projects and programs at various scales on restoration, but the degree of success remains hardly detected. Moreover, the success of these calls for continuous monitoring also needs baseline information with clear indicators.

By undertaking the NEA process, the prospects for the country to avoid unforeseen, long-term consequences of decisions made can be avoided. The country is undertaking the NEA process to support the critical judgement of options and uncertainty enabling decisions to choose policies that sustain the appropriate mix of services i.e., between attaining food security and the ongoing maintenance of biodiversity conservation. This is critical when the country is confronted with the urgency to diversify its economic base to rescue the shrinking economy. The NEA process is proportionately necessary to support the requirement for international and regional reporting on biodiversity besides providing baseline conditions for national planning and monitoring. Currently, these obligations face information hiccups and insufficient understanding are formidable barriers to sound strategic actions.

Without proper ecosystem assessment, Malawi stands to face the extreme challenge of justifying the benefits of ecosystem services, thereby perpetuating decision-makers' misunderstanding of how their actions might change these services. Misconceptions are loaded when short-term political and monetary benefits take precedence over ideals of sustainability. NEA holds promise to expel these misconceptions by providing evidence based. In the long term, the NEA process will support decisions on biodiversity and ecosystems to take full account of their values to the country's economy and human well-being. The scoping stage of Malawi's NEA process has already begun bridging between development and environmental communities by increasing awareness of the links between ecosystem management and the attainment of economic and social goals. Political support is growing given the country's unique position to reverse ongoing challenges of land degradation, deforestation, waterbody pollution, and climate change.

² The updated NDC describes a sectoral framework of measures to enhance Malawi's climate adaptation and resilience, along with a set of indicators to monitor and evaluate their progress, aiming at increasing the resilience of its people, ecosystems and economy. NEA stands to provide the baseline indicators for monitoring progress.

The NEA process is in a juxtaposition within this myriad of wicked problems to aid sound and informed decisions.

To meet both local and global conservation goals, Malawi's management of biodiversity especially those occurring in PAs is regulated under both Multilateral Environmental Agreements (MEAs) and domestic legal frameworks both of which provide guiding principles and standards upon which conservation endeavor affiliates. On a global scene, Malawi is party to several MEAs including the Convention on Biological Diversity (CBD), the African Convention on the Conservation of Biological Diversity and Nature and Natural Resources, the Ramsar Convention on Wetlands of International Importance, UNESCO Convention for the Protection of the World Cultural and Natural Heritage, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and many more. Some of the MEAs are pertinently necessary instruments to ensure effective protection of biodiversity and ecosystems as well as ensuring their sustainable utilization. For example, the CBD upholds the notion of sustainable wildlife management which entails the sound management of the wildlife species to sustain their populations and habitats over time, considering socioeconomic needs of the human populations (Decision 14/7). CITES on the other hand, aims to ensure that international trade in wild animals and plants does not threaten the survival of the species. The CBD relates to the fact that, governments are committed to completing ecologically-representative systems of protected areas (PAs), and this process usually starts by identifying gaps in the current system – typically through an ecological gap analysis which involves identifying biodiversity (i.e., species, ecosystems and ecological processes) not adequately conserved within a PA system or through other effective and long-term conservation measures. The NEA process has a role to play in this context although stakeholders must attend first to immediate priorities before these long-term exigencies.

Although the MEAs are legally binding on the country Parties – they do not substitute national laws – rather they provide frameworks to be respected by each Party, which has to adopt its own domestic legislation to ensure that they are implemented at the national level. For example, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is particularly relevant to the planning for PAs since they harbor, among others, African elephant populations which with the exception of the populations of Botswana, Namibia, South Africa, and Zimbabwe are included in CITES Appendix I. Malawi is also a country Party to the United Nations Framework Convention on Climate Change (UNFCCC). The country seeks to contribute to the ambitious goal of limiting temperature rise to 2°C with efforts to reach 1.5°C agreed under the Paris Agreement. Malawi ratified the UNFCCC in 1994, and in line with the Paris Agreement submitted its Intended Nationally Determined Contribution (INDC) in 2016 which became its first NDC in 2020. The Malawi NEA should take cognizance of the UNFCCC since biodiversity and ecosystems have implications for both mitigation and adaptation. This is coupled with the fact that the biodiversity sub-sector is vulnerable to the impacts of climate change, the NEA is better placed to provide synergistic roles with existing endeavors.

Malawi recognizes that, biodiversity and ecosystem conservation cannot be governed by a single framework of legislation, as such the National Biodiversity Strategy and Action Plan II (NBSAP II) was developed to provide the country's strategies and action plans for a period of 2015-2025 prioritizing biodiversity management programs among other socio-economic and environmental issues. The strategy demonstrates Malawi's commitment to the implementation of Decision X/2 of the Tenth Conference of the Parties (CoP10) of the Convention on Biological Diversity (CBD), which requested country Parties to revise their strategies in line with the Global Strategic Plan for Biodiversity. While the NEA aims to inform the National Planning for Biodiversity, the process will also generate evidence to support international reporting requirements without compromising local perspectives.

The NEA process not only aligns with many legal instruments which broadly recognize the value of biodiversity and ecosystems services and the principles of benefit sharing, public engagement in decision making, GESI, and the sustainability for future generations, but it is also a process for operationalization of these instruments. These instruments include, the Republic of Malawi (Constitution) Act of 2020; the National Environmental Policy (NEP) of 2004; and the Environment Management Act (EMA) of 2017. Sector-specific policies/legislation relevant to the implementation of biodiversity programs in Malawi include: the National Forestry Policy of 2016; the National Forestry Act of 2019; the National Fisheries and Aquaculture Policy of 2016; the Fisheries Conservation and Management Act of 2014; the Wildlife Policy of 2018; the National Parks and Wildlife Amendment Act of 2017; the National Land Resources Management Policy and Strategy of 2002; The National Herbarium and Botanic Gardens Act of 2014; the Water Resources Act of 2013; the Irrigation Policy of 2016; the Energy Policy of 2018; the Biosafety Act of 2014; the Biosafety (Genetically Modified Organisms) Regulations of 2019; the National Biosafety and Biotechnology policy of 2008; the Patents Act of 2008; the National Monuments and Relics Act of 2014; the Plant Protection Act of 2018; the Local Government Act of 2017.

The Malawi NEA process is cognizant of the fact that biodiversity and ecosystems have for centuries co-existed with indigenous people and local communities either within or adjacent areas. due to land use pressure, ecosystems in the country do not exist with buffer zones to absorb the negative interactions between biodiversity and adjacent agroecosystems. Thus, the people's voices must be heard in the NEA process. An important outcome of the preceding observation, coupled with the large scope of the legal and policy frameworks pinpoint to awaken to the call for interdisciplinary and transdisciplinary approaches to the NEA process. Identification and implementation of solutions to challenges facing the biodiversity and ecosystem services further calls for a shared responsibility and cooperation with Indigenous People and local communities' perspectives, the private sector, NGOs and civil society. This is the rationale behind our scoping processes described later in this report.

1.2. Ecosystem Types Under the Assessment

As agreed during the scoping process, the NEA will cover three main ecosystem types: terrestrial, aquatic, and wetlands ecosystems. The choice of these ecosystems was based on a set of criteria that included the following parameters: ecological significance, socio-economic significance, and likelihood of successful intervention.

1.3. About the Scoping Report

This scoping report is a product of wide stakeholders engagement, including governmental, non-governmental organizations and practitioners which ran through a period of one year (Annex 1). This process complemented with deskwork has provided the opportunity to generate the policy questions and proposed methodology (section2) for the expert evaluation stage. Active engagement and participation of stakeholders through framing workshops, focus group discussions, key informant interviews and observations in potential sites for cas studies, contributed altogether to this report.

1.4. Potential uses of the Assessment

Throughout the scoping process, it has been clear that, a cross- section of the society, including government ministries and departments, the private sector, higher education institutions and conservation NGOs will make the use of NEA report in many different ways.

- **Reporting Obligations:** Malawi has reporting obligations under the National obligations Environmental outlook. However, information is often scattered. The NEA report will synthesize available information on biodiversity trends, distribution and status to contribute to fulfilling this obligation. In addition, the world bank produces a country Environmental Analysis which compiles and reviews existing analyses on Malawi's environmental and natural resources (ENR) and explores what the evidence means for poverty and economic development. The World Bank will find useful the NEA report for this purpose, although it goes beyond to influence policy and decision making.
- **Strategic Planning and Action:** The country produces an NBSAP document every five years. The NBSAP cycle will soon be overdue. The NEA report will generate data and information on biodiversity and ecosystem services status and trends useful for updating the NBSAP which at the same time will respond to the global biodiversity framework (domesticating global strategy at national level). In addition, the country has an obligation on updating NAP as well as the NDC will need information on biodiversity and ecosystem services for scheming nature-based adaptation solutions to climate change.
- **Policy and Decision Making: Evidence for policy.** Management of wetlands in Malawi lack clear policy direction as they fall under no jurisdiction. They are open to abuse at the expense of habitat conservation. The current status of wetlands and their values to various groups of people in the Malawi society remain unknown. The NEA report will guide the policy direction highlighting subtle balances among competing demands.
- **Large scale Ecosystem Benching Marking and Monitoring:** Reliable indicators of structure and function will be agreed upon to provide the scientific basis for assessing the status of an ecosystem, including how commercial fisheries interact with the rest of the ecosystem. Such assessments are important for the fisheries, parks, wildlife and forestry because they would help managers gauge the sustainability of different utilization of policies, detect when an ecosystem is on an undesirable path, and evaluate options to avoid those paths. For example, the Department of Forestry has been implementing a National Forest Landscape Restoration Strategy (NFLRS) across the country. The NEA report will provide information on the current distribution of activities to show gaps in implementation

and inform the department about their implications. Some species promoted are invasive with the potential to disrupt the functions of natural ecosystems. The NEA report will guide the new direction of these activities based on evidence and knowledge.

1.5. Organization of this Report

The rest of the report is structured into three additional sections. Chapter 2 will cover the methodological approach to both the scoping process and the upcoming expert evaluation stage. Chapter 3 describes the conceptual framework as an outcome of the scoping process including the policy question for each ecosystem type. The conceptual framework also informs the structure of the expert evaluation stage.

CHAPTER 2 – METHODOLOGY

2.1. Overview

The scoping report is a product of wide stakeholder and knowledge holders' consultations combined with desk research and expert judgment. This approach facilitated dialogue among all relevant actors within different groups of stakeholders and knowledge holders and reviewed and validated the scoping findings which have been summarized in this scoping report. The overall methodology for the scoping exercise is summarized below (Figure 1). The subsequent stage of the assessment will involve the expert evaluation of existing knowledge and information to produce the assessment report. This is further described in the subsequent sections.

2.2. The General Approach

The production of the scoping report has seven subsequent steps culminating with a trialogue involving all relevant stakeholders and knowledge holders and our international collaborators (Figure 2). These steps include the launch of the NEA process to country-wide stakeholders, framing workshops, validation of the scoping report while at the same time the dissemination of the scoping findings.

2.2.1. The Scoping Process

Table 1: The NEA Scoping Process and Related Activities

LAUNCH OF THE NEA PROCESS THROUGH STAKEHOLDER WORKSHOP	<ul style="list-style-type: none"> • Mapping of stakeholders of interest • Identification of IPBES National Focal Point • Introduction of the NEA process to stakeholders • Formation of Ecosystem Technical Working Groups
NATIONAL STAKEHOLDER ENGAGEMENTS	<ul style="list-style-type: none"> • Identification of Authors of the Technical Working Groups • Identification of thematic assessment areas • Prioritization of ecosystems of interest • Definition of the scope of work by the project team • Development of terms of reference for the TWGs
SCOPING PROCESS	<ul style="list-style-type: none"> • Country-wide stakeholder and knowledge holder engagement • Research and literature review undertaken by the assessment team and research fellows • ILK framing workshop • Dialogues with ILK holders • Drafting of policy questions • Validation of policy questions through trialogue workshop
SCOPING REPORT PREPARATION	<ul style="list-style-type: none"> • Drafting of the report undertaken by the project team with findings from the scoping activities. • Incorporation of stakeholders' inputs
VALIDATION AND FINALISATION OF THE SCOPING REPORT	<ul style="list-style-type: none"> • Trialogue workshop <ul style="list-style-type: none"> ○ Discussions, further refinement, and adoption of the policy questions ○ Drafting of action plans • Incorporating stakeholders' and knowledge holders' comments in the scoping report •
SCOPING REPORT REVIEW AND APPROVAL	<ul style="list-style-type: none"> • External review of the scoping report • Incorporation of comments from external reviewers • Approval of the scoping report by the National Biodiversity, Steering Committee
DISSEMINATION	<ul style="list-style-type: none"> • Editing and printing of the scoping report • Development of policy briefs • Dissemination through regional meetings, research conferences

2.2.2. *The Launching of the NEA Process*

The launch involved two levels of engagements. First, a national workshop was organized to introduce the objectives of the NEA process. Second, the team organized regional framing workshops through which the assessment team conducted meetings with district officials to solicit their commitment to active participate in the project and the framing workshops in particular. During the regional meetings potential knowledge holders who would attend the framing workshops were identified. The district officials informed them about the workshops. The framing workshops were conducted in three regions of the country namely, Northern, Central and Southern regions. The selection of districts in each region to participate in the workshop was guided by the need to represent the three types of ecosystems of the assessment - terrestrial, aquatic and wetlands.

- ***Northern Region:*** In the Northern Region Workshop, three main ethnic groups were engaged, selected purposefully from the three districts namely, Mzimba, Rumphu and Nkhata Bay (Fig 1). Nkhata Bay is a lakeshore district with scattered wetlands in the transition between inland and Lake Malawi. Forests in this district largely occur in the upland areas. On the other hand, Rumphu and Mzimba were selected in consideration of their proximity to the Nyika National Park and related forest reserves.
- ***Central Region:*** The Central Region was represented by two districts – Salima and Lilongwe with a focus on aquatic and terrestrial ecosystems, respectively. The dominant ethnic group in this region is Chewa and the main language of communication is Chichewa. Participants from Salima came from villages adjacent to Thuma Forest Reserve and Lake Malawi. While those from Lilongwe District came from areas near Dzalanyama Forest Reserve.
- ***Southern Region:*** The participants for the Southern Region workshop were drawn from three districts including Nsanje, Mulanje and Zomba. Nsanje harbors the Elephant Marsh (Wetland), Lake Chilwa occupies part of Zomba, and Mulanje Mountain is in Mulanje. Thus, these districts have wetlands and terrestrial mountain ecosystems.

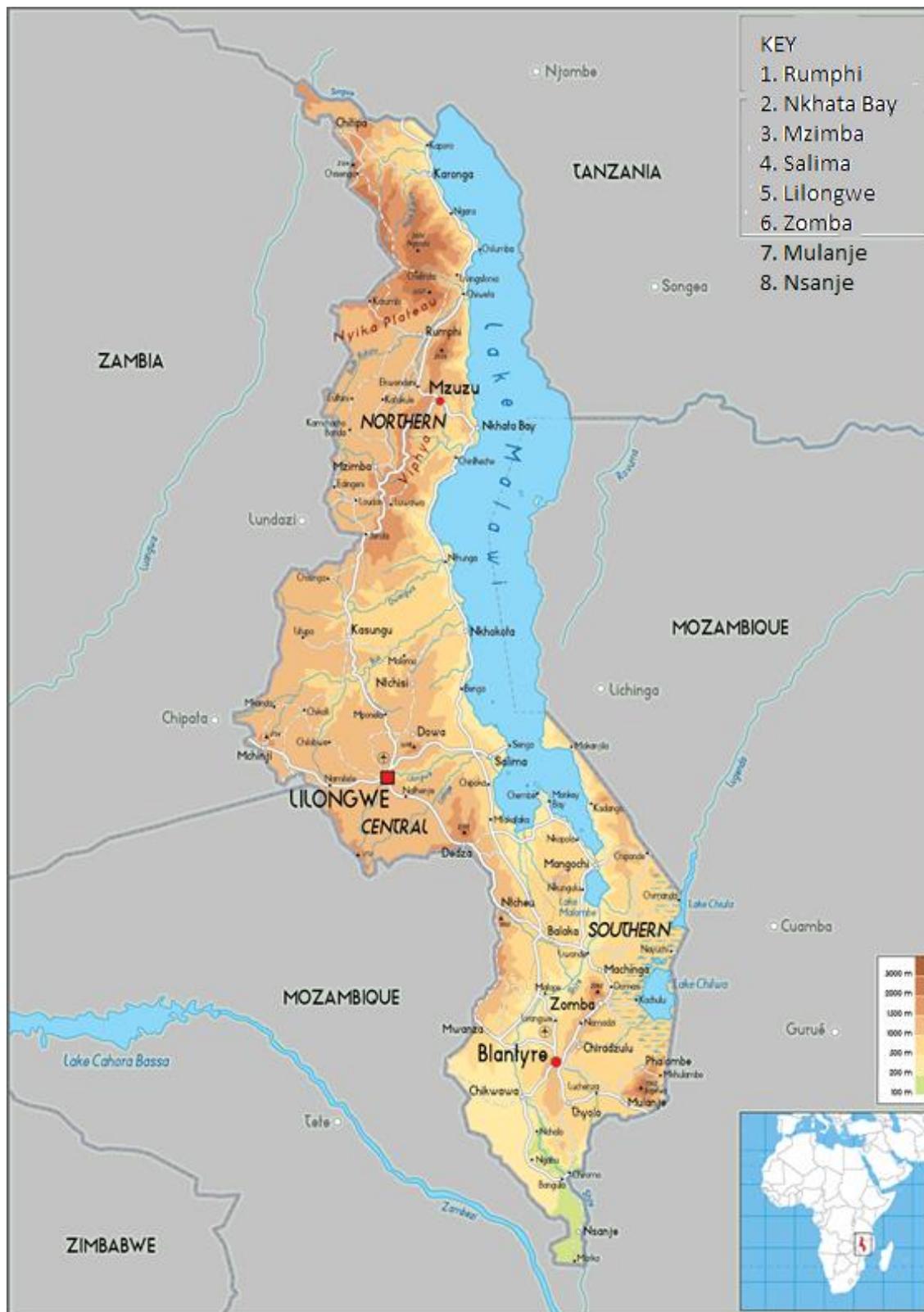


Figure 1: Map of Malawi showing districts involved in framing workshops.

Indigenous and local knowledge holders from these districts were selected during a one-day awareness meeting conducted in each district from 1-8 December 2021. Forty local knowledge holders were selected with support from the district technical staff, five

from each of the eight districts. Each district had a traditional leader who was identified based on their long-accumulated knowledge and experiences in their local areas.

2.2.3. Approach to the Framing Workshops

Free, Prior, Informed Consent (FPIC): As a requirement in research ethics, participants were asked if they were willing to share local knowledge and experiences in conservation and management of nature and accept if their knowledge can be used in the NEA report. In all the regions, participants willingly accepted and signed free, prior informed consent forms (FPIC) leading to the onset of the discussions.

NEA Project Presentation: A presentation was made to explain the assessment rationale, its methodological approach and how it addresses challenges such as the complex nature and intrinsic uncertainties of nature-people relations in the country. The presentation comprised the background to the NEA project including its objectives and benefits to human wellbeing, biodiversity and ecosystem services.

Focus Group Discussions (FDGs): Each district brought at least a traditional leader who was identified by the district officials based on their long-accumulated knowledge and experience in their local areas. The chiefs were in one group to allow their subjects in separate groups to freely express themselves while at the same time allowing themselves to discuss the same questions allocated to all the groups. Except for the group comprising all chiefs the rest of the groups were organized according to the district of origin. Participants from one district were placed in one group as they shared common knowledge and practices which would create a common ground of discussion. Except for the group comprising all chiefs, the rest of the groups were organized according to the district of their origin. Participants from one district were placed in one group on the assumption that they share common knowledge and practices which would create a common ground of discussion.



Figure 2:Framing workshop in progress in Mzuzu (Northern Region)



Figure 3: Framing workshop in progress Salima (Central region)

Checklist: Deliberations were guided by checklist of a set of questions translated into the most commonly spoken language – Chichewa. Deliberations in each group were led by a member of the NEA team who, prior to the workshop, was oriented on how to conduct the discussions based on the correct understanding of the questions. Each group was further guided by an overall facilitator who moved between the four groups to ensure that the questions are correctly understood and that the discussions within the demands of the issues are discussed within the demands of the questions. All discussions were scripted either on a flip chart or PowerPoint ready for presentations in a plenary session. Each group selected its representative from the local participants to present although the group of chiefs was an exception.

Group Work Plenary Sessions: Each FGD appointed a representative to make a presentation of their proceedings to share with the rest of the groups. Members from other groups were given the chance to ask questions for further elaboration where necessary.



Figure 4: Framing workshop in progress Blantyre (Southern Region)

2.2.4. *Follow up Meetings*

Reflection on the outcomes of the ILK framing workshop report revealed gaps that necessitated the need for follow-up field activities to meet the elderly knowledge holders who could not make it to the framing workshop. The same districts targeted during the framing workshops were targeted during the follow-up field visits. Through dialogues and storytelling, elders shared their experiences, worldviews, practices and knowledge in the conservation of biodiversity and ecosystems in their areas. The follow up meetings were organized with the objectives to: (i) further refine ILK research questions, (ii) assess the suitability of M'bona Khulubvi sacred shrines, (iii) Mbenje Island and Mtsinja shrine as potential ILK study sites, (iv) conduct a preliminary data collection to feed into the scoping report (v) and create trust with ILK holders for further engagement during the evaluation phase, (vi) refine ILK themes and research questions identified during the framing workshops, (vii) validate ILK content provided during the framing workshops and provide new perspectives and insight, (viii) identify local communities' issues of concerns and priorities that could be addressed by the national ecosystem assessment, explore suitable methods of mobilizing and synthesizing ILK in the evaluation phase.

The follow up meeting concluded the following;

- Malawian local communities apply ILK to observe biodiversity (e.g. animal, insect and plant behavior and variability), along with atmospheric observations (e.g. temperature, wind, and precipitation patterns). These observations allow local communities to identify biotic and abiotic indicators on which they rely for weather and climate prediction over different spatial and time scales. The communities were able to predict early warning systems when the rainy season is approaching.

- ILK provides an integrated model of how different ecosystems, including terrestrial, aquatic and wetlands interact with one another and indicate ecosystem changes, trends, and patterns relevant for coping with climate change, identifying and managing risks, and guiding adaptation on a daily, seasonal, annual, and intergenerational scale.
- Bringing ILK and science into dialogue and mutual understanding can generate best existing knowledge that is useful for both knowledge systems, and society, and can provide an important foundation for national adaptation planning and policy development.
- Engaging transdisciplinary dialogues and conducting activities in which ILK and science engage to address common problems creates opportunities of improving the existing knowledge for a wide range of areas of biodiversity and ecosystems. However, there is a challenge for knowledge systems to work synergistically due to differences between their systems which brings challenges in terms of developing capacity of the bearers of the knowledge systems. It therefore requires the engagement of scientific experts from different disciplines, enabling scientists' understanding of the holistic knowledge held by elderly ILK holders.
- Recognizing the respective value of each knowledge system is a key to an effective transdisciplinary process. A successful transdisciplinary engagement requires attention to existing power inequities between knowledge systems and adopting the human right based approach which considers biodiversity and ecosystems and social vulnerabilities to local communities and their ILK systems. There is power imbalance whereby science occupies a dominant role. This challenge undermines transdisciplinary dialogues.
- Gender dynamics consideration is mostly important in working with and understanding ILK. The discussions showed different gender aspects with regards to knowledge production, transmission, analysis, and decision-making. Local communities revealed that changes in climate have contributed to changes in gender patterns, hence the need to take gender dynamics into consideration.

2.2.5. Delineating and Prioritizing Ecosystems for Assessment

Although Malawi is relatively a small country in area, biodiversity and ecosystems services expansively occur with varying degree of spatial extents such that, any meaningful attempts to undertake assessments at national scale might prove futile, and hence the need for spatial scoping and prioritization. Malawi is entirely located in the tropics – between 9°30S at its northernmost point and 17°S at the southernmost tip bordering three countries including Zambia to the northwest, Mozambique to the southwest, and southeast, and Tanzania to the northeast. The country occupies an area of 118,480 km² of which 24,400 km² consists of water, mostly Lake Malawi (**Figure 3**).



Figure 5: Map of Malawi Indicating Neighboring Countries As Potential International Pathways Through Which IAS Can Move In And Outside The Country (Source: <https://www.mapsofworld.com/malawi/>).

The country's topography moderately varies but creates climatically suitable environments for the many different plant and animal species occurring in different landscapes. Mountainous landscapes are surrounded by the Rift Valley, plateaus rise generally 800m to 1,200m above sea level, although some rise as much as 3,000m in the north. To the south of Lake Malawi lies the Shire Highlands, approximately 900m above sea level. The sub-tropical climate conditions and annual changes between wet and dry seasons provide heterogeneous habitats for a diversity of species. The wet season generally occurs between November and April and the dry season between May and October. Average temperatures range between 18° and 27°C, and the wet season can bring average monthly rainfall in the order of 150mm to 300mm. The timing, variation and intensity of rainfall are interlinked with the movements and inter-annual changeability of the Inter-Tropical Convergence Zone (ITCZ). Local rainfall-conditions within Malawi also fluctuate across the varied landscapes of the country - from high altitude and steep escarpments (which can experience higher rainfall).

While the general climate is tropical, the influence of its high elevation means that temperatures are relatively cool. The warm-wet season stretches from November to April, during which 95% of the annual precipitation takes place. Due to diverse broad scale landscapes, Malawi experiences large heterogeneity in rainfall regime, and there are big differences between the North, Central and South regions. Annual average

rainfall varies from 725mm to 2,500mm with Lilongwe having an average of 900mm, Blantyre 1,127mm, Mzuzu 1,289mm and Zomba 1,433mm. A cool, dry winter season runs from May to August with mean daytime temperatures varying between 17 and 27°C, and temperatures falling between 4 and 10°C at night. A hot, dry season lasts from September to October with daytime temperatures between 25 and 37°C.

2.3. Priority Ecosystems

Malawi is a land of remarkable biodiversity inclusive of large and small mammals, birds, fish, butterflies, and a variety of plant species of significant socio-economic and ecological values. Protected areas (PAs), comprising five national parks, four wildlife reserves, three nature sanctuaries and 87 forest reserves – cover almost 21% of the country's total area (Figure 6).

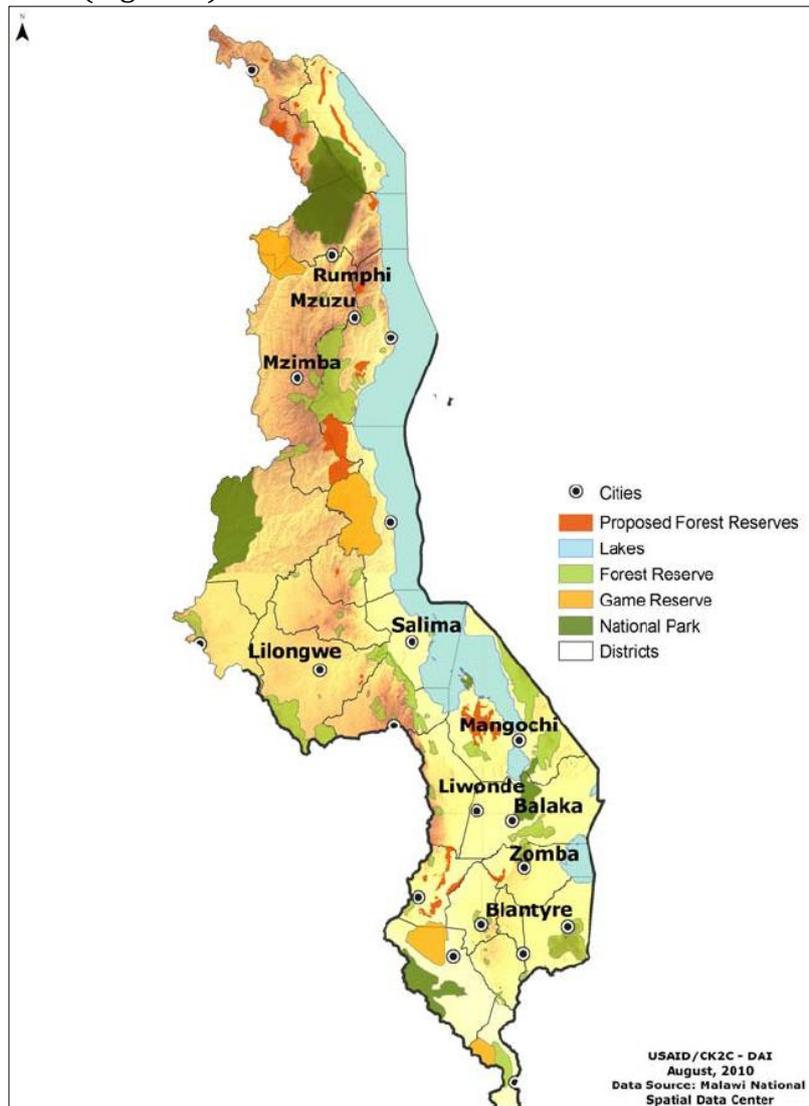


Figure 6: The spatial distribution of different types of ecosystems and associated biodiversity in Malawi including lakes, forest reserves, national parks and wildlife reserves.

These PAs represent fine examples of the broad range of biodiversity and ecosystems that have occurred for centuries. Different types of ecosystems including terrestrial, aquatic and wetlands are fairly spread across ecoregions of the country (Figure 3). However, the highest diversity and endemism of aquatic life is observed in Lake Malawi,

with over 1,000 species of fish. By and large, PAs are surviving as “islands of biodiversity” since outside PAs biodiversity and associated ecosystems are increasingly being decimated due to many complex factors.

2.4. Description of Priority Ecosystems for the Assessment

Malawi’s terrestrial ecosystems include forests and woodlands, mountains, national parks and wildlife reserves, grasslands, and riparian areas. The management of the ecosystems is different based on whether management is under community, government or a private organization. Different policies of the Malawi Government guide management of the ecosystems in the different areas. Protected ecosystems such as national parks and wildlife reserves have the richest biodiversity while public and community areas are characterized by general degradation of resources largely due to habitat loss and over exploitation. Several ecosystems have been selected for more rigorous assessment and the criteria that has been used in selecting such terrestrial ecosystem. This section provides elements to be assessed including data and information on terrestrial ecosystems. Based on existing data and knowledge needs, the expert evaluation will establish the status of the different terrestrial ecosystems, size, and the socioeconomic contribution of each of the ecosystems to the national gross domestic product (GDP), livelihood and other services.

Common classifications of ecosystems in Malawi broadly refer to two major categories including terrestrial and aquatic ecosystems. However, for the purposes of the NEA, the aquatic ecosystem category is split into a separate category of wetlands. The reason being to give adequate attention to the wetland which the country biodiversity and ecosystem polices have neglected for some time now.

- (a) Terrestrial ecosystems:** The terrestrial ecosystems are fairly well distributed across the country, and they include forests, mountains and grasslands. The country supports 87 forest reserves, five national parks, four wildlife reserves and three nature sanctuaries. The goal of establishing national parks, wildlife reserves and nature sanctuaries is to preserve Malawi’s natural heritage and to promote their use for scientific and recreational purposes. National parks protect important wildlife populations, major water catchment areas, and landscapes of high aesthetic value. The Nyika National Park occupies part of the Northern Region. Mulanje Mountain is in Mulanje District.
- (b) Aquatic ecosystems:** Aquatic ecosystems cover about 20% of the total surface area of Malawi and are habitats to a diversity of fish and other aquatic fauna and flora. Major aquatic ecosystems in Malawi include lakes (Malawi, Malombe, Chilwa, Kazuni and Chiuta), rivers (Songwe, South Rukuru, North Rukuru, Dwangwa, Linthipe, Shire, Bua River), and Lake Malawi crosses Karonga, Nkhata Bay, Nkhotakota, Salima and Mangochi.
- (c) Wetlands:** Wetlands are small water bodies including floodplains which are found in all regions of the country but occupying large areas down south. The small water bodies include lagoons and manmade reservoirs. The largest lagoon is Chia which harbors more than 24 fish species located in Nkhotakota. Other wetlands such as Elephant Marsh and Lake Chilwa are big and play an important ecological function as bird sanctuaries and destinations for migratory birds.

Elephant Marsh is located down lower Shire in Nsanje District while Lake Chilwa is in Zomba District.

- (d) **Species Diversity:** Terrestrial, aquatic as well as wetland ecosystems are rich in both plant and animal species diversity. Some species are threatened, others are rare, and others are endangered while some are endemic to specific regions of the country. A detailed discussion regarding the species richness and diversity across the country may not be necessary for the purpose of this report.

It was technically problematic to distinguish between a wetland and an aquatic ecosystem given the existing international conceptualization of these types of ecosystems. The Ramsar Convention (1971) defines wetlands as: “areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six meters”. This definition is so encompassing that every waterbody can be regarded as wetland. Notwithstanding, the United States Fish and Wildlife Service definition considers wetlands as: “lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water”. For prioritizing ecosystems for the NEA, we adopt the later definition and refine it to refer wetlands to include floodplain, swamps and marshes locally known as *dambos*. (Figure 7).



Figure 7: An example of wetland the NEA process proposes to include during the expert evaluation stage.

Wetland ecosystems in this assessment have been given priority given the fact, there is lack of policy attention and they are increasingly declining despite their recognized values in terms of biodiversity and agricultural production. In the assessment the team will focus on the following areas under wetlands ecosystems:

2.5. Validation of Scoping Findings Through Trialogue Workshop

The Malawi NEA team organized a national trialogue workshop to realize effective co-production of multidisciplinary knowledge and bring together and enhance collaboration between multiple knowledge systems. Particularly, the team engaged stakeholders with different kinds of knowledge from different sources, including policymakers, researchers and practitioners, for a dialogue. The trialogue workshop aimed to jointly:

- Generate input to the scoping report and validate the proposal in the said report.
- Raise awareness and agree on how to access the existing information from various sectors based on the agreed policy questions.
- Review, refine and validate the adequacy and relevancy of the policy questions based on the existing information and knowledge gaps.

2.5.1. Approach to the Trialogue Workshop

Preparatory meetings: The trialogue was facilitated in collaboration with the international facilitators from UNDP, UNEP-WCMC, and UNESCO and national facilitators (Malawi NEA project team members). Preparatory meetings prior to the Trialogue were conducted to brainstorm on the approach and finalize the program for the Trialogue workshop. The Trialogue was designed to have workshop meetings and a field visit. To enhance the successful field visit, the team further met with all ILK holders invited to plan for the field meeting and proceeded to Nzarule Village in Salima district which was the identified site for the field visit to finalize the planning with the hosts participants. During this meeting confirmations about the venue, planned activities, the approach of the trialogue and other logistical issues were discussed and agreed upon.



Figure 8: Trialogue preparatory meetings in Salima (Central region of Malawi)

Group work: The trialogue was organized in a participatory manner to make sure it instills a spirit of ownership of the assessment process. Participants were put in groups based on the thematic ecosystem types (aquatic, terrestrial and wetland). Each group was given a task to determine the observed trends in the state of the ecosystem, determining the most important drivers of change for the mentioned ecosystem types and then ranking the ecosystem types according to their ecological, social, and economic

significance, determining actual risks and determining whether they are affected by climate change. They were ranked with respect to low, medium and high where 1 represented low, 2 represented medium and 3 represented high. At the end participants were made to give totals for the ranking. The groups then determined by going through the specific policy questions to check whether the policy questions captured the issues that the groups were discussing for each respective ecosystem type.



Figure 9: Trialogue interactive sessions in progress

Field visits interactive session: Indigenous and local knowledge holders from seven districts (Mulanje, Nsanje, Lilongwe, Salima, Mzimba, Rumphi and Nkhatabay), of the three regions of the country, were selected to participate in the trialogue. During the interactive session right at the field, stakeholders from all groups shared their experiences, lessons learned and challenges. The discussion focused on community - nature nexus looking at the multiple values of nature and ILK and good practices. The discussion went ahead to look at the experienced challenges and unforeseen opportunities of drivers of change whether negative or positive. The other thematic discussion was on community-government collaboration, its challenges and how this can be improved. Lastly, policy issues were identified from the interactive session. After the field visit the policy issues were discussed during the plenary where stakeholders were asked on priorities the value of the ILK in their groups.



Figure 10: Briefing on prioritization of ILK issues in progress

The working group were followed by presentation where each group presented the outcome of their discussions and then plenary followed to reach consensus where recommendations on how the policy issues to be included in this scoping report were made. These policy issues were compiled into policy questions as presented in this scoping report.

CHAPTER 3 – CONCEPTUAL FRAMEWORK

3.1. Overview

This chapter describes the conceptual framework which guides the methodological approach to the expert evaluation stage. The scoping stage has so far engaged various sources of information including the Scientific, Indigenous and local knowledge (ILK) systems across three regions of the country. In the subsequent stage, which is the expert evaluation stage, the conceptual framework will remain instrumental in translating usable knowledge into policy making across spatial scales, alongside a normative function to engage diverse knowledge systems, promoting inclusivity and enhancing the legitimacy of the process.

Considering the diversity of perspectives on nature and different epistemologies the assessment envisages balancing power inequalities and meeting the wider normative objectives of the national conservation goals. The framework subscribes to the notion of bridging different knowledge systems which require more than merely co-creating but also addressing the normative issues of how, where, and why knowledge is used to support action (Wyborn 2015)³. To develop this more critical and reflexive approach, the framework is recognizance of the gap between science, policy, and practice as a space for continuous communication and negotiation throughout the process (Wyborn 2015).

3.2. Purpose and Objectives of the Framework

To guide the Malawi NEA team to assess biodiversity and ecosystems based on consistent concepts, resulting in knowledge and information that is useful to policymakers and practitioners in biodiversity and ecosystem conservation. Specifically, the conceptual framework has the objectives to:

- (a) Elucidate concepts that help the Malawi NEA team to consider in making judgements when application of the concepts does not lead to a single meaning.
- (b) Determine the appropriate boundary of the national assessment by considering the information needs of the users of the assessment report that is relevant and that faithfully represents what it purports to achieve.

3.3. General Description of the Framework

The assessment team adopted the IPBES conceptual framework which provides an integrated view of the biodiversity knowledge–policy interface to stimulate new thinking, and accommodate diverse human perceptions of biodiversity, for effective and useful engagement of a wide range of stakeholders and knowledge holders (Fig. 1). By adopting this framework, the assessment process will comprehensively capture varied stakeholder interests and where conflicts of interests emerge the engagement of all stakeholders will provide a platform for reconciliation.

³ Wyborn, C. (2015). Connectivity conservation: Boundary objects, science narratives and the co-production of science and practice. *Environmental Science & Policy*. <https://doi.org/10.1016/j.envsci.2015.04.019>

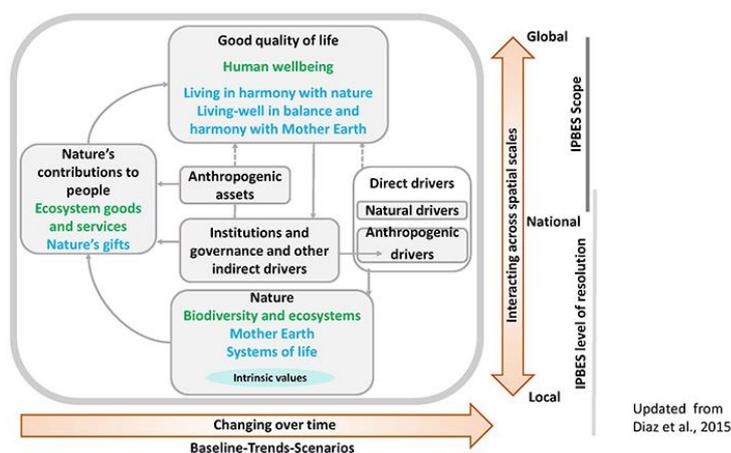


Figure 11: Conceptual Framework (Adopted from IPBES as Cited from Diaz et al., 2015)

This conceptual framework is a highly simplified model of the complex interactions between the natural world and human societies and how they constantly influence the state of each other. The conceptual framework includes six interlinked elements constituting a social-ecological system that operates at various scales in time and space and these include: (i) nature (ii) nature’s contributions to people (iii) anthropogenic assets (iv) institutions and governance systems and other indirect drivers of change (v) direct drivers of change; and (vi) good quality of life. These elements are treated as the most relevant to the assessment’s goal in generation of knowledge to inform policy and the required capacity-building.

3.3.1. Conceptual Grounds of Understanding

To reduce divergent interpretation of the concepts used in the assessment, this section provides context-based meanings.

Nature: The concept of nature carries both broad and specific meanings depending of the context. "Nature" can refer to the phenomena of the physical world, and also to life in general. The study of nature is a large, if not the only, part of science. Although humans are part of nature, human activity is often understood as a separate category from other natural phenomena. Specifically, this assessment refers nature to the natural world including categories such as biodiversity, ecosystems and its functions, the biosphere, humankind’s shared evolutionary heritage, and biocultural diversity. The assessment may not be comprehensive enough to capture nature’s intrinsic values, that is, the value inherent to it, independent of human experience and somewhat beyond the scope of anthropocentric valuation approaches.

Anthropogenic assets: Refers to built-up infrastructure, knowledge including ILK systems and technical or scientific knowledge, as well as formal and non-formal education, technology (both physical objects and procedures), and financial assets, among others. The relevance of this concept to the assessment is that a good life is achieved by a co-production of benefits between nature and societies.

Nature's benefits to people: Refers to all the advantages humans derive from the natural world. This category includes ecosystem products and services, whether they are viewed individually, or as a whole. Nature's gifts and related terms in different knowledge systems refer to the advantages of nature from which people draw a high standard of living. This broad category also includes elements of nature that may be harmful to humans, such as pests, infections, or predators. All of nature's benefits have anthropocentric value, including relational values that promote desirable relationships, such as those between people and nature, and instrumental values that contribute to a good quality of life, which can be conceptualized in terms of preference satisfaction.

Institutions and governance systems and other indirect drivers. They refer to the ways in which societies organize themselves, and the resulting influences on other components. They are the underlying causes of environmental change that are exogenous to the ecosystem in question. Because of their central role, influencing all aspects of human relationships with nature, these are key levers for decision-making. Institutions encompass all formal and informal interactions among stakeholders and social structures that determine how decisions are taken and implemented, how power is exercised, and how responsibilities are distributed. Institutions determine, to various degrees, access to, and the control, allocation and distribution of components of nature and anthropogenic assets and their benefits to people. Examples of institutions are systems of property and access rights to land (e.g., public, common-pool, private), legislative arrangements, treaties, informal social norms and rules, including those emerging from ILK systems, and international regimes such as agreements against stratospheric ozone depletion or the protection of endangered species of wild fauna and flora. Economic policies, including macroeconomic, fiscal, monetary or agricultural policies, play a significant role in influencing people's decisions and behavior and the way in which they relate to nature in the pursuit of benefits. Many drivers of human behavior and preferences, however, which reflect different perspectives on a good quality of life, work largely outside the market system.

Drivers of change refers to all those external factors that affect nature, anthropogenic assets, nature's benefits to people and a good quality of life. They include institutions and governance systems and other indirect drivers and direct drivers (both natural and anthropogenic).

Direct drivers, both natural and anthropogenic, affect nature directly. "Natural drivers" are those that are not the result of human activities and are beyond human control. These include earthquakes, volcanic eruptions and tsunamis, extreme weather or ocean-related events such as prolonged drought or cold periods, tropical cyclones and floods, the El Niño/La Niña Southern Oscillation and extreme tidal events. The direct anthropogenic drivers are those that are the result of human decisions, namely, of institutions and governance systems and other indirect drivers. Anthropogenic drivers include habitat conversion, e.g., degradation of land and aquatic habitats, deforestation and afforestation, exploitation of wild populations, climate change, pollution of soil, water and air and species introductions. Some of these drivers, such as pollution, can have

negative impacts on nature; others, as in the case of habitat restoration, or the introduction of a natural enemy to combat invasive species, can have positive effects.

Good quality of life is the achievement of a fulfilled human life, a notion which varies strongly across different societies and groups within societies. It is a context-dependent state of individuals and human groups, comprising access to food, water, energy and livelihood security, and also health, good social relationships and equity, security, cultural identity, and freedom of choice and action. From virtually all standpoints, a good quality of life is multidimensional, having material as well as immaterial and spiritual components. What a good quality of life entails, however, is highly dependent on place, time and culture, with different societies espousing different views of their relationships with nature and placing different levels of importance on collective versus individual rights, the material versus the spiritual domain, intrinsic versus instrumental values, and the present time versus the past or the future.

3.3.2. Interlinkages Between the Elements

The attainment of a high standard of living within a society and the perception of what this involves have a direct impact on institutions, governance structures, and other indirect factors, which in turn have an impact on all other elements. For instance, to the extent that a good life refers to a person's immediate material needs and rights, or to the collective needs and rights of the present and future generations, it affects institutions that operate on a range of scales, from the subnational level, such as land and water use rights, pollution control, and customary hunting and extraction arrangements, to the global level, such as ratification of international treaties. Through institutions, a high quality of life and its views also indirectly influence how people and groups view nature. Perceptions of nature range from nature being considered as a separate entity to be exploited for the benefit of human societies to nature being seen as a sacred living entity of which humans are only one part.

Institutions, governance structures, and other indirect drivers also have an impact on all elements and are the main causes of the anthropogenic factors that have an adverse impact on nature. For instance, the amount of land that is converted and allocated to food crops, plantations, or energy crops is influenced by lifestyle decisions, economic and demographic growth, and lifestyle choices (indirect drivers). Synthetic fertilizer subsidy policies have also significantly contributed to the detrimental nutrient loading of freshwater and coastal ecosystems, to name a few. All of these have significant impacts on ecosystem health, biodiversity, and the benefits they provide, which in turn affect the many social structures designed to address these issues. For example, the convention on the United Nations Framework Convention on Climate Change, which operate on a worldwide scale the Convention on Biological Diversity, the Convention on the Conservation of Migratory Species of Wild Animals or, at the national and subnational levels, arrangements in ministries or laws that have effectively contributed to the protection, restoration, and sustainable management of biodiversity.

Additionally, institutions and governance systems and other indirect drivers also affect the interactions and balance between nature and human assets in the co-production of nature's benefits to people, for example by regulating urban sprawl over agricultural or

recreational areas. This element also modulates the link between nature's benefits to people and the achievement of a good quality of life, for example, by different regimes of property and access to land and goods and services; transport and circulation policies; and such economic incentives as taxation or subsidies. For each of nature's benefits that contribute to a good quality of life, the contribution of institutions can be understood in terms of instrumental value, such as access to land that enables the achievement of high human well-being, or in terms of relational values, such as regimes of property that both represent and allow human lives deemed to be in harmony with nature.

3.4. Contextualizing the Framework

This framework shall guide in understanding relationships between social and environmental drivers of the county's ecosystem changes over space and time. The assessment shall identify drivers that generate stress and cause both positive and negative pressures on the terrestrial, aquatic and wetlands ecosystems, considering their geographic distribution as agreed during stakeholder engagement processes in the scoping stage.

The resulting feedback of ecosystem changes are assumed to alter the physical, chemical, and biological state of the ecosystems to cause impacts on ecosystems and livelihoods. Humans may react to pressures by taking mitigating measures to manage the various priority ecosystems in this assessment. In the interest of this assessment, focus shall be directed towards identifying various knowledge systems that have informed different programs and have proven working. That will include indigenous and scientific knowledge systems with related practices.

Policy consideration in the assessment is one of the most important elements as depicted in the conceptual framework. However, policies can be supportive of biodiversity and ecosystems, although they can also be in conflict of their conservation. Similarly, practices may be informed by policies and vice versa. In Malawi, there are several policies that have been formulated but understanding how they promote biodiversity and ecosystem conservation remains unclear. Most importantly the role of indigenous and local knowledge in this regard has received limited attention. For instance, contemporaneous ecosystem challenges have exacerbated given major drifts in socio-political, cultural and economic transitions that have occurred in the past decades since the advent of democracy in the country rendering ILK less relevant. The assessment team shall focus on examining the impacts of the existing policies and identify knowledge gaps.

3.5. Emerging Policy Related Questions

Against the preceding framework supported by the scoping findings, the NEA team will address five policy related questions. These policy questions can be revisited and revised throughout the assessment process to ensure the assessment remains relevant to decision-making processes and emerging needs.

3.5.1. Broad Policy Questions

The following are the broader policy questions highlighted in the scoping process:

- (i) How do the biodiversity and ecosystem services provided by wetlands, lakes and rivers, forests, woodlands, national parks, and wildlife reserves across the

- country contribute to the country's economy, local livelihoods, food security, and good quality of life, and what are their interdependences with each other?
- (ii) How do biodiversity and ecosystem governance including the use of scientific, Indigenous, and local knowledge interact to influence policy and decision-making processes?
 - (iii) What are the status, trends, and potential future dynamics of aquatic, terrestrial, and wetland biodiversity and ecosystem services, and what are the pressures that affect their contribution to the country's economy, livelihoods, and well-being in the various regions in the country?
 - (iv) What are the actual and potential impacts of various policies and interventions on the contribution of biodiversity and ecosystem functions and services to the sustainability of the national economy, local livelihoods, food security, and good quality of life in the country?
 - (v) What knowledge gaps need to be addressed to better understand and assess drivers, impacts, and responses to wetland, aquatic and terrestrial biodiversity, and ecosystem services at the national level?

3.5.2. Specific Policy Questions within Thematic Chapters

A. Policy questions under wetlands ecosystem

- (i) How do the biodiversity and ecosystem services provided by wetlands, across the country contribute to the country's economy, local livelihoods, food security, and good quality of life, and what are their interdependences with each other?
- (ii) How do biodiversity and ecosystem services governance include the use of scientific, Indigenous, and local knowledge influence policy and decision-making processes in wetland management?
- (iii) What is the nature of wetland governance and knowledge management systems required for the integration of local and scientific knowledge for a more comprehensive knowledge base for policy and decision-making?
- (iv) What are the status, trends, and potential future dynamics of wetlands biodiversity and ecosystem services, and pressures that affect their contribution to the country's economy, livelihoods, and well-being in the various regions of the country?
- (v) What are the most important pressures and factors undermining the contributions of wetland ecosystems to human well-being and livelihoods of present and future generations of local communities?
- (vi) What are the key drivers of wetland ecosystems which undermine sustainability for the benefit of both current and future generations?
- (vii) What are the actual and potential impacts of various policies and interventions on wetland biodiversity and ecosystem services to the sustainability of the national economy and local livelihoods.
- (viii) What policy responses, measures, and processes exist for the strengthening and improving the governance of wetlands and delivery of ecosystem services, with regard to local communities and their knowledge and practices.
- (ix) What are the contributions of local communities in terms of their knowledge, practices, and views on wetland management and species conservation, including the delivery of ecosystem services for human wellbeing, and livelihoods at the local and national level?

B. Policy questions under Aquatic ecosystems

- (i) How do the aquatic biodiversity and ecosystem services provided across the country contribute to the country's economy, local livelihoods, food security, and good quality of life, and what are their interdependencies with each other?
- (ii) How do aquatic biodiversity and ecosystem governance including the use of scientific, Indigenous, and local knowledge interact to influence policy and decision-making processes?
- (iii) How has the transition from one party to multiparty dispensation in Malawi affected the traditional values and ILK that influence the management and conservation of aquatic ecosystems?
- (iv) What are the status, trends, and potential future dynamics of aquatic, biodiversity and ecosystem services, and what are the pressures that affect their contribution to the country's economy, livelihoods, and well-being in the various regions of the country?
- (v) How have local, national level institutions contributed to the conservation of aquatic resources for the last fifty years?
- (vi) What are the actual and potential impacts of various policies and interventions on the contribution of aquatic biodiversity and ecosystem functions and services to the sustainability of the national economy, local livelihoods.
- (vii) How can we strengthen the knowledge and practices of Indigenous Peoples and local communities in managing aquatic ecosystems and ensuring their sustainability?
- (viii) What are the possibilities of using ILK in improving policy instruments and institutional arrangements for aquatic biodiversity conservation and the cost of not doing so?
- (ix) How are recognizing and implementing indigenous peoples' rights at the national level affecting aquatic resources in areas managed by Indigenous Peoples and local communities?
- (x) Have national interventions been effective in protecting ILK in the aquatic ecosystem?

C. Policy questions under Terrestrial ecosystems

- (i) How do the biodiversity and ecosystem services provided by forests, woodlands, national parks, and wildlife reserves across the country contribute to the country's economy, local livelihoods, food security, and good quality of life, and what are their interdependences with each other?
- (ii) How do biodiversity and ecosystem governance for terrestrial ecosystems including the use of scientific and local knowledge interact to influence policy and decision-making processes?
- (iii) Do current community-level bylaws (CNRM, beach village committees) incorporate cultural and traditional beliefs and practices?
- (iv) What are the status, trends, and potential future dynamics of terrestrial biodiversity and ecosystem services, and what are the pressures that affect their contribution to the country's economy, livelihoods, and well-being in the various regions of the country?

- (v) How do natural resource management policies address human population issues against resource increase demand?
- (vi) What are the actual and potential impacts of various policies and interventions on the contribution of biodiversity and ecosystem functions and services in terrestrial ecosystems?
- (vii) Have all environmental multilateral agreements in which Malawi is a member country, been domesticated through local instruments or legal permits?
- (viii) How have local, national and international level institutions and policy tools, and strategies involving IPLCs contributed to the conservation of nature and sustainable provision of nature's contributions to people over the last fifty years?
- (ix) What knowledge gaps need to be addressed to better understand and assess drivers, impacts, and responses to wetland, aquatic and terrestrial biodiversity, and ecosystem services at the national level?

TEMPORAL SCALE CONSIDERATION

It is widely recognized that ecosystem services operate at different spatial and temporal scales. It is noted that functions are directly linked to larger and longer-term scales of ecological processes, and that services are more related to current short-term socio-cultural and economic processes. The NEA is driven by policy needs but policies have different time scales of their implementation.

The NEA report will draw from different sources of knowledge – scientific and Indigenous and local knowledge with secondary sources for dating ten years back. The choice of this time scale is driven by the need to set baseline enough for exploring potential future scenarios. Addressing the policy questions presented earlier suggests the need for sufficient time scale to discern trends. The country began undergoing significant environmental change since 1994 and soon the country transitioned into a democratic dispensation. Since then, state control over renewable natural resources has remained a toll order. Ten years down the line, observation was clear that the country was undergoing an environmental transformation, but documentation has remained challenging until recently when international and national reporting requirements have intensified. Hence, the choice of ten years.

Again, inclusive biodiversity policies have been developed in the past twenty years. Thus, data availability and reliability may vary through time in the country's context within the past ten years based of lessons drawn so far. In the same vein, twenty years in the future will be a suitable time scale for the assessment to be relevant. This suggests that the assessment will take a multiple scale approach to cater for different policies, national planning requirements and international reporting needs.

3.6. Approach to the Expert Evaluation

The scoping stage marks the first step of the national ecosystem assessment process. During the scoping stage, the framework and direction of the assessment are identified in collaboration with stakeholders and knowledge holders. This stage dwells much on stakeholder engagements and multiple evidence base approach. The scoping stage facilitates the development of the rationale and methodologies of the assessment, it also informs the potential uses of the assessment, ensuring that all components of the assessment are relevant to decisionmakers and practitioners.

The scoping stage supports the creation of a shared understanding around the national ecosystem assessment process and is collectively owned by relevant stakeholders. Engagement of key stakeholders at the onset of the scoping stage helps to instill ownership of the assessment process and its outputs.

3.6.1. Stakeholder Engagement Process

Stakeholder engagement is the most important process in the national ecosystem assessments. Engagement of stakeholders seeks to identify what people value about an ecosystem and to what extent. Early engagement of stakeholders ensures that relevant ecosystem services are included in the assessment.

3.6.2. Desk Research

Literature review of existing knowledge on terrestrial, aquatic, and wetlands in Malawi was conducted by authors, fellows, and co-chairs. This includes both published and grey literature including research, national reports, strategies, and policies on biological diversity and ecosystems of Malawi. Information from all these documents including the NBSAP II was compiled and summarized and provided background information and context, highlighting the main ecosystems in Malawi, and offering preliminary data on the state, trends, and drivers of change. The information collected coupled with stakeholders' views guided the formulation of policy questions and the rationale for the proposed NEA.

This scoping report was developed through consultation with a range of stakeholders, including both governmental and non-governmental organizations, and desk research using academic journals, project reports, and national plans and policies including the National Biodiversity Strategy and Action Plan (NBSAP II) and the sixth national report to the Convention on Biological Diversity. Strong participation was a major component of the methodology utilized in the scoping exercise. In order to achieve sustainability, economic equity, and social justice, participatory techniques allow communities and their institutions to manage and control resources, mobilize and authenticate popular knowledge, and uphold cultural integrity. As a result, significant care was taken in the design of the scoping process, as described below, to include as many stakeholder viewpoints and local expertise as feasible.

3.6.3. Approval Process

In Malawi, the National Biodiversity Steering committee (NBSC) performs a role of providing a forum for effective policy dialogue on frameworks, priority setting, and means of facilitating investment and transfer of technology on biodiversity initiatives in the country. It also enhances collaborative project development and implementation, with a view to optimizing the contribution of biodiversity management programmes to sustainable development. Specifically, the committee is responsible for reviewing and approving all key outputs of the national ecosystem assessment process. In June 2023 the NBSC approved this scoping report which will hence forth be used as a guiding tool for the evaluation stage.

3.6.4. Assumptions

The proposed NEA will be based on existing scientific literature, grey literature and Indigenous and local knowledge and will draw on the work of existing institutions and networks and other relevant stakeholders. The assessment team will be able to draw

upon a list of references of published and grey literature, along with comments assembled during the meetings held during scoping process. The success of the NEA is based on the following assumptions;

- The assessment expert group will be diverse in terms of skills, gender and national coverage and demonstrate total commitment throughout the process.
- The expert group will consist of more than 20 authors and 10 review editors, who will be selected in accordance with the procedures adapted from IPBES following a call for nominations after the approval of the scoping report by the National Platform on Biodiversity.
- The assessment expert group will be supported by the national implementing agency and the Biodiversity and Ecosystem Services Network (UNDP, UNESCO, and UNEP-WCMC and its NEA initiatives) to support their capacities to develop the NEA.

3.6.5. Identification of Issues

The Constitution of the Republic of Malawi recognizes the importance of biodiversity to the economy and as source of livelihood for the majority of Malawians. Section 4d of the Constitution calls for the need to conserve biological diversity for the present and future generations. The National Biodiversity Strategy and Action plan (NBSAP) of 2015-2025 has identified several drivers of biodiversity loss which include deforestation, habitat loss, invasive alien species, climate change and unsustainable farming practices. Stakeholders' consultations meetings including the launch of the NEA project revealed more issues leading to biodiversity loss and ecosystem degradation. Sectors that shared issues identified in their sectors include forestry, fisheries, water and wildlife. Furthermore, indigenous and local knowledge holders consulted during the framing workshop and field visits shared main issues that has led to biodiversity loss in different ecosystems in their areas.

3.7. Data Management Plan

Data and knowledge for the NEA will be identified through stakeholder engagement which will involve a series of meetings with experts from various fields including but not limited to natural science, economist, social scientists, GIS experts, and indigenous and local knowledge holders. The inclusion of experts from natural resources-based sectors such as agriculture, forestry, fisheries, and water in the technical working groups will be done purposefully to enhance access to available publications and reports from their sectors. Available national websites relevant to biodiversity such as the Biodiversity Information Facility, Clearing House Mechanism (under development), and the Nation page of Biodiversity Financing Initiative (BIOFIN) will also provide the required data and knowledge on biodiversity.

The website mentioned above will be key in storing the data and knowledge to be collected in this assessment. Knowledge products which will among others include the technical report of the assessment, summary for policymakers, policy brief, posters, and leaflets will be uploaded on the websites and hard copies will be shared with all relevant institutional libraries including universities where they can act as reference materials.

Data and knowledge gaps will be identified with reference to prioritized policy questions for each of the ecosystem types being assessed, where the available data is

insufficient or absent to address the policy questions will serve as an indicator for data or knowledge gap. All data and knowledge gaps will be reported as such and recommendations for future research will be made where appropriate.

3.6. Integration of Scenarios for the Future

The current state of ecosystems in all ecosystem types as prioritized, past status and future change trends will be assessed in the form of various scenarios and models that will be developed. The period from the past to the present will be assessed in the form of a trend or one scenario, while the period from today to the future will be assessed in the form of two scenarios. These scenarios will mainly focus on Business as usual (BAU) and Sustainable Ecosystem Management (SEM) scenarios. The length of the past period will vary depending on the availability of information. The next period will be forecast for all ecosystem types until 2050. For example, for aquatic ecosystems, the past will cover 1973-2018 and the future will be forecast until 2050.

Scenarios will be developed based on both raw data (e.g., forest area) and indicators (e.g., forest cover and species index), and the choice of which indicator will depend on the availability of information. Below is the suggested tentative scenario during the NEA.

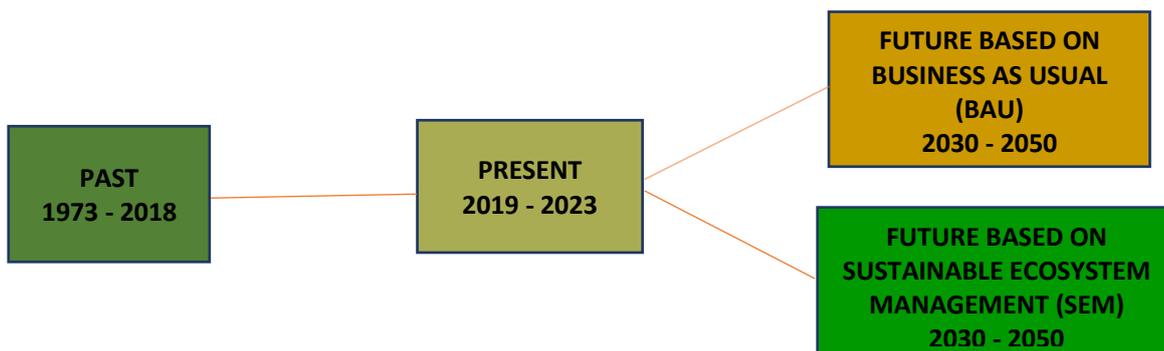


Figure 12: Suggested Scenarios of NEA Process

Scenario development will proceed in the NEA process as a useful approach to creating awareness, articulating and searching for feasible solutions to the challenges of governing ecosystem services articulated earlier in each thematic areas of the assessment. The approach to building scenarios will originate from both models and stakeholder participation, to assess outcomes from alternative future trajectories, through model analysis and planning with stakeholders, to inform decision making.

The degree of stakeholder involvement in scenario planning will range from roles with information input (consulting) to mutual process design (co-development). We propose five steps of scenario development and analysis to guide the integration of stakeholders for discussion:

Step 1: Identification and prioritization of relevant system’s components. For each ecosystem type, components of interest will be identified.

Step 2: Characterization of past and current conditions and trends. For each ecosystem type, baseline conditions will be characterized to provide a reference point for understanding the patterns and processes driving change.

Step 3: Development of a set of scenarios (explorative). A set of scenarios will be developed for each ecosystem type and a set of assumptions will guide the various scenarios of interest. Climate change, population growth and land use changes are some of the major driving factors to consider.

Step 4: Choice of response variables and targets to assess scenarios according to services provided by the specific ecosystem (normative step), and

Step 5: Proposal of potential management strategies to achieve a desirable future through a back casting process.

To progress from the baseline scenario to the development of policy/management scenarios, the following procedures will be undertaken:

Step 1: Choosing a relevant baseline (agreed with stakeholders) as a reference for policy scenario assessments.

Step 2: Identifying problems, challenges, barriers (formulation of an objective) and specifying targets (as a result from the baseline assessment).

Step 3: Screen measures and instruments (partly suggested by stakeholders) suitable to be analyzed with scenarios and models.

Step 4: Designing and constructing alternative pathways, or indicator trajectories, i.e., response actions derived from strategies, through models and/or narratives.

Step 5: Build relevant policy scenarios and analyze outputs.

3.6. Gender, Indigenous and Local Knowledge Inclusion

Indigenous Peoples and local communities have in-depth knowledge of their environments. They are key actors in biodiversity conservation while also being directly impacted by the degradation of ecosystems. Environmental related policies can have a direct impact on communities and their livelihoods. However, these and their in-depth knowledge on conservation of these ecosystems are often excluded from decision - making processes. Therefore, the NEA is working towards amplifying the unique voices, perspectives, and contributions of Indigenous Peoples and local communities to make better decisions for the conservation of biodiversity and ecosystems services. The NEA scoping exercise has already benefitted a lot from community stakeholder consultations ton members to gather ILK information. A technical working group on ILK has been formulated which will be working across all three thematic chapters (aquatic, terrestrial, and wetlands ecosystems). All the themes will have ILK sub-chapters to incorporate all issues under ILK in the expert evaluation report.

On the other hand, gender equality and women's empowerment are critical to achieving biodiversity and ecosystem services objectives. Gender responsive environmental policies and planning can deliver multiple benefits for women and biodiversity. Women and girls have a high potential to lead knowledge production and implementation of the solutions on the ground. For instance the scoping exercise has revealed that women and girls from indigenous and local communities have a high potential to hold a distinctive set of capacities and practices due to their special relationship with nature. This makes them unique knowledge holders mostly needed in the assessment. The NEA recognize the contribution all gender groups especially women and girls at all levels of the assessment. The expert evaluation report has recognized, and included and will acknowledge all contributions from all genders.

3.6. Project Communication, Stakeholder Engagement and Capacity Building

The NEA project has developed a communication strategy which involved compiling a plan to effectively disseminate information about the NEA's findings, goals and importance to various stakeholders. The communication strategy has been developed to meet the following objectives:

1. Strengthened collaboration with different stakeholders in information sharing for decision making, strategic planning and action for biodiversity.
2. Enhanced engagement with policymakers, academia, and local communities, in the assessment of biodiversity and ecosystem services for knowledge coproduction and utilization.
3. Strengthened evidence-based decision-making and awareness for sustained biodiversity and ecosystem services, and sustainable livelihoods.
4. Increased gender consideration and women's participation in the national ecosystem assessment for inclusive decision-making.

TARGET AUDIENCES

The target audiences for this communication strategy include the following:-

- Project team and partners institutions within and outside Malawi
- Local communities
- Government Departments
- Traditional leaders
- Decentralized local government structures.
- Policymakers
- The academia
- Civil societies/non-governmental organization
- The media

Communication activities will be disseminated using the broadest possible means. The organization and participation of various events, the regular flow of information about the NEA in different media houses, dissemination of different publications including flyers and policy briefs, the dissemination of information about the NEA on social networks are the main means of communication. In addition, NEA plans to hold several

events at Lilongwe University of Agriculture and Natural Resources (LUANAR) with the participation of students.

All NEA documents will be translated into the local language and distributed to all stakeholders, universities, academia and research organizations, ministries, civil society, and community organizations. Project communication and stakeholder engagements of the project began with four stakeholder workshops. In these workshops, project partners and stakeholders came together to develop comprehensive action plans for the project. International workshops were other activities held for capacity building were. There have been several capacity-building activities within the authors as well as the project team. Capacity building activities were delivered through international webinars, local meetings as well as international in-person workshops with UNEP-WCMC, UNDP and UNESCO. The NEA project will continue to build capacity within the project team and technical working groups for a successful expert evaluation.

3.6. Proposed Assessment Report Structure

Cover Page

Acknowledgements

Abbreviations and Acronyms

EXECUTIVE SUMMARY

CHAPTER 1 – INTRODUCTION

1.1. Report Overview

1.2. Policy Questions

1.3. Potential Uses of the Report

1.4. Scope of the Report

CHAPTER 2 – CONCEPTUAL FRAMEWORK AND METHODOLOGY

2.1. Description of the Conceptual Framework

2.2. Stakeholder Engagement

2.3. Scenario Building

CHAPTER 3 – AQUATIC ECOSYSTEMS

3.1. INTRODUCTION

This chapter will be an introduction to the assessment, providing background to the assessment process, area of study, and scope of work. It will provide an overview of the status of aquatic ecosystems in terms of type and size in Malawi and their importance. It will include terminology and definitions, and information on aquatic flora and fauna. ILK will be integrated in the introduction

3.2. SITUATION ANALYSIS

The assessment will conduct a situation analysis to look at the opportunities, challenges and threats, trends and status of the aquatic ecosystems. The following areas will be the focus of the situation analysis.

Trends and status of hydrological regimes,

Trends and status of sediment regime

Trends and status of water quality

Status and trend of fisheries (food fish and ornamental fish)

Status and trend of aquatic wildlife

Status and trend of aquatic vegetation

Indigenous and local knowledge defining trends and status of aquatic biodiversity in aquatic ecosystems in Malawi.

3.2.1. Trends and status of hydrological regimes

This will cover water flow/ movement, volume, distribution and management of water resources, water cycles, conservation and use over the period.

3.2.2. Trends and status of sediment regime

This subsection will assess sediment composition in terms of sedimentary components, including heavy minerals and clay minerals, grain size.

3.2.3. Trends and status of water quality

This section will cover water quality trends and status of the aquatic ecosystems focusing on the biological, physical and chemical characteristics.

3.2.4. Status and trend of fisheries (food fish and ornamental fish)

This subsection will cover both food fish and ornamental fish trade, species richness, species endemism, production estimates by biomass or number, fish production by water body and district, invasive alien fish species, their origin and level of spread, species richness, species abundance, per capita consumption, economic value at beach price level and economic value accruing from ornamental fish trade (export), cultural values connected to ornamental fish, among others.

3.2.6. Status and trend of aquatic wildlife

This will cover aquatic wildlife diversity in both open and protected areas, populations by species, species richness, abundance, endemism, introduced species, translocations, human-wildlife conflicts, other common threats of wildlife and key management strategies.

3.2.7. Status and trend of aquatic vegetation

This will cover both emerged and submerged aquatic vegetation (SAV), invasive alien species, their origin and level of spread, species richness, species abundance by water body, among others.

3.3. DRIVERS PRESSURES STATE AND TREND IMPACT AND RESPONSES

The starting point will be identification and prioritization of the issues. This will be followed by the expounding of the drivers of aquatic ecosystems change, the associated pressures, the status and trends of the ecosystem changes, the resultant impact of the changes on the ecosystems, livelihood and economic development; and the responses to improve the situation (Table 3.1).

Table 3.3.1: Drivers Pressures state and trend impact and response (DPSIR) framework

Priority Issue	State and Trends	Driver	Pressure	Impact	Response
Soil erosion	Formation of gullies, increasing overtime	Population growth and estate establishment	Siltation of rivers and loss of soil fertility	Loss of aquatic biodiversity Low yield Food insecurity	Soil and water conservation initiatives
Loss of biodiversity	Reduced animal and plant species over time	Population growth and deforestation, pollution of water bodies	Loss and extinction of species,	Disturbed ecosystem services	Biodiversity conservation programmes

Drivers: Fundamental processes in society that drive activities having a direct impact on the environment.

Pressures: Human interventions (intentional or unintentional) in social and economic sectors of society that result in environmental change.

State and trends: Environmental state and trends, often referred to as environmental change, which could be both naturally and human induced.

Impacts (environmental, economic and social) Sustainable development triangle:

Changes that may positively or negatively influence human well-being through changes in ecological services and environmental stress.

Responses (past and current programs): Elements among the drivers, pressures and impacts which may be used for managing society in order to alter the human-

environment interactions. These may include programmes and other interventions on the ground.

3.4. AQUATIC ECOSYSTEM SERVICES (BENEFITS AND VALUES)

Energy: This subsection will discuss the role of aquatic ecosystems in the energy sector. It will focus on energy production through riverine gorges and fuel wood production for energy production.

Hydrology: This section will cover the importance of aquatic ecosystems in the provision of hydrological services in the country. These include water cycles, etc.

Ecotourism: This sub section will cover the importance of aquatic ecosystems to the tourism industry in the country. It will further show the status of the existing tourist attraction centers their type e.g. lakes, mountains and rivers in the country. This will also show estimates of tourist populations and their economic contribution to their local economy.

Food Production: This sub section will highlight the role of aquatic ecosystems in the primary production in terms of staple food such as crop, livestock and fish.

Non-economic values: This sub section will cover issues regarding the non-economic values of aquatic ecosystem in terms of cultural, social, recreation, scientific, spiritual and aesthetical values.

Indigenous and local knowledge insights on value of aquatic ecosystems

3.5. POLICY ANALYSIS FOR AQUATIC ECOSYSTEMS

Understanding policies and policy instruments governing aquatic ecosystems

Conducting a full scan of the policies and their implementing instruments i.e; goals, targets and strategies

Community bylaws and disconnect/synergy with fishery legislations

Conducting policy gap and coherence analysis

Conducting action-impact analysis

Provide a summary of policy failures and successes in order to develop credible statements regarding the adequacy of past and current policy responses for restoring and maintaining the state of the aquatic ecosystems, and facilitating adaptation to impacts.

Potential impacts of local knowledge and beliefs on aquatic ecosystems towards conservation interventions.

3.5 Cross cutting issues

- a) Climate change and Aquatic biodiversity
- b) Business and Aquatic biodiversity
- c) Gender and human rights interactions in Aquatic biodiversity

CHAPTER 4 - TERRESTRIAL ECOSYSTEMS

4.1. INTRODUCTION

This chapter will be an introduction to the assessment, providing background to the assessment process, area of study, and scope of work. It will provide an overview of the status of terrestrial ecosystems in terms of type and size in Malawi and their importance. It will include terminology and definitions, and information on terrestrial flora and fauna. It will also include Indigenous and local knowledge defining trends and status of terrestrial ecosystems.

4.2. SITUATION ANALYSIS

4.1. SITUATION ANALYSIS

4.1.1. STATUS

4.2. DRIVERS PRESSURES STATE AND TREND IMPACT AND RESPONSES

The starting point will be identification and prioritization of the issues. This will be followed by the expounding of the drivers of terrestrial ecosystems change, the associated pressures, the status and trends of the ecosystem changes, the resultant impact of the changes on the ecosystems, livelihood and economic development; and the responses to improve the situation (Table 4.1).

Table 4.1: Drivers Pressures state and trend impact and response (DPSIR) framework

Priority Issue	State and Trends	Driver	Pressure	Impact	Response
Soil erosion	Formation of gullies, increasing overtime	Population growth and estate establishment	Siltation of rivers and loss of soil fertility	Loss of aquatic biodiversity Low yield Food insecurity	Soil and water conservation initiatives
Loss of biodiversity	Reduced animal and plant species over time	Population growth and deforestation, pollution of water bodies	Loss and extinction of species,	Disturbed ecosystem services	Biodiversity conservation programmes

This section shall unveil all types of terrestrial ecosystems in terms of flora and fauna diversity, species richness, evenness and endemism and extent of support of livelihoods and other services for each type of ecosystems.

Formulation of policies is one of the responses made in trying to manage the impacts of different drivers of ecosystem change. There are several policies that have been formulated by Malawi Government and the team shall assess the impact of the existing policies, identify gaps in policies, review the implementation status, assess extent of conflicts and links among different policies and assess extent of harmonization. Some of the details to be assessed on existing policies include:

- Impact existing policies have on terrestrial ecosystems i.e. impact on management, utilization, conservation and sustainability
- Impact of existing policies on the improvement of these ecosystems
- Customary governance system and community bylaws in management of terrestrial resources
- Policy gaps limiting sustainable management, utilization, conservation and improvement of these ecosystems.
- The current implementation status of these policies i.e. are goals, objectives, and targets being met as a result of the associated policy directions
- Policy proposals to improve management, utilization and conservation of these ecosystems.
- Policy links, conflicts, duplication, clarity and harmonization, existing conflict of interests coming from the policies.
- Impact of national priorities on terrestrial ecosystem policy implementation Malawi Growth and Development Strategy III, Malawi Vision 2063 among others.

Include a paragraph on ILK in the situation analysis section to highlight the drivers, pressures status and trend impact and responses of terrestrial ecosystems covering both flora and fauna.

4.2.1 STATUS AND TRENDS (to cover both Flora and fauna)

Include a paragraph on ILK on each of the 3 ecosystems (Forest, mountain and agricultural)

❖ FOREST ECOSYSTEM

- **Parks and wildlife**
 - National Park
 - Wildlife Reserve
 - Nature Sanctuaries

○ **Forestry**

- Forestry Reserves
- Plantations (both public and private)
- community forest areas
- grasslands

❖ MOUNTAIN ECOSYSTEM

❖ AGRICULTURAL ECOSYSTEM

- Tree crops
- Trees on farm

4.3. DRIVERS OF BIODIVERSITY LOSS

Include ILK to highlight the drivers of biodiversity loss as well as ILK loss focusing on intergeneration transfer.

4.4. POLICY ANALYSIS (all policies related to conservation and governance structures)

Include ILK highlighting the aspect of co-management and governance.

4.5. SCENARIOS

4.6. CONCLUSION

CHAPTER 5– WETLAND ECOSYSTEMS

5.1. INTRODUCTION -

This chapter will define wetlands and categorization of wetlands in the Malawian context. In-land and shore line)

As this chapter will also be an introduction to the assessment, providing background to the assessment process, area of study, and scope of work, it will explain the categorization of wetlands and their definition, including the definitions provided by various international and scientific fora. The categorization based on inland wetlands and shore line wetlands will be considered considering that Malawi has a very big shore line that is significant for the conservation of Lake Malawi and important aquatic resource. It will provide an overview of status of wetland ecosystems in terms of type and size in Malawi and their importance and include information on flora and fauna found in wetlands. Include ILK in the introduction.

5.2. SITUATION ANALYSIS

The assessment will conduct a situation analysis to look at the trends and status of the aquatic ecosystems. The following areas will be the focus of the situation analysis.

- The status and trends of inland wetlands
 - The status and trends of shore-line wetlands
- The status and trends of wetland vegetation: This will cover both emerged and submerged wetland vegetation, invasive alien species, their origin and level of spread, species richness, species abundance by wetland, among others.

- Status and trends of fisheries wetland and wetland fauna: This will cover wetland wildlife diversity, populations by species, species richness, species abundance, species endemism, introduced species, translocations, human-wildlife conflicts, other common threats of wildlife and key management strategies.
- Status and trends land cover, soil erosion, water quality and sedimentation around wetland areas
- The ecosystem health of wetland (Habitat quality-health, ecosystem integrity and functioning)
- Categorization of the landscape transformation that has taken place in the areas (spatially over the years)
- Include ILK in the situation analysis which will include status and trends of wetlands ecosystems under the management of ILK and traditional beliefs.

5.3. DRIVERS PRESSURES STATE AND TREND IMPACT AND RESPONSES

The starting point will be identification and prioritization of the issues. This will be followed by the expounding of the drivers of wetlands ecosystems change, the associated pressures, the status and trends of the ecosystem changes, the resultant impact of the changes on the ecosystems, livelihood and economic development; and the responses to improve the situation following a DISPIR framework model or any other model that has recently being used by the IPBES.

ILK will be included to highlight the drivers, pressures, status and trends, impact and responses in wetland ecosystems.

5.3.1 DRIVERS

Human interventions (intentional or unintentional) in social and economic sectors of society that result in environmental change. Under the drivers of wetlands, the following will be considered:

- Climate change
- Demographic factors
- Agriculture and land use change
- Socio-economic factors
- Infrastructure

5.3.2 PRESSURES

Under the Pressures the following will be considered

- Pollution including wastes (inorganic)
- sedimentation from soil erosion
- Destruction of habitat
- Drying up of wetlands and
- Invasive alien species

5.3.3. STATE

Environmental state and trends, often referred to as environmental change, which could be both naturally and human induced. Under the State the following will be considered

- Drying of wetlands
- Fragmentation of wetlands
- Shrinking of wetlands
- Sedimentation of wetlands

5.3.4 IMPACTS

Environmental, economic and social impacts will be assessed focusing on changes that may positively or negatively influence human well-being through changes in ecological services and environmental stress. Under Impacts the following will be considered

- Loss of biodiversity and ecosystem goods and services
- Loss of biodiversity and ecosystem services on livelihoods and the economy

5.3.5 RESPONSES

Responses will look at past and current programs and Elements among the drivers, pressures and impacts which may be used for managing society in order to alter the human–environment interactions. These may include programmes and other interventions on the ground. Under Responses the following will be considered

- Wetland conservation programs
- Soil and water conservation

5.4. Wetland Biodiversity and Ecosystem Services (benefits and values)

ILK will be integrated to highlight the multiple values of nature to IPLCs and their rules that governs their use.

Under the benefits we will consider quantitative and qualitative values of wetland biodiversity and ecosystem services:

5.4.1 Provisioning

- i. Food Production
- ii. Water Supply
- iii. Building materials wetland (Reeds)
- iv. Energy
- v. Fisheries
- vi. Edible wetland plants tubers

5.4.2 Regulatory Services

- i. Erosion control
- ii. Drought control
- iii. Carbon sequestration
- iv. Nutrient recycling]
- v. Water purification

5.4.3 Supporting Services

- i. Pollination
- ii. Habitat support

- iii. Diseases regulation

5.4.4 Cultural and recreation services

- i. Tourism
- ii. Cultural
- iii. Aesthetic and inspiration
- iv. Education
- v. Spiritual

5.5. POLICY ANALYSIS FOR WETLAND ECOSYSTEMS

Under this section the following areas will be considered

1. What policy frameworks exist on wetlands, what do they address and what are the gaps?
2. What is the Relevance of policy in enhancing wetland conservation and sustainable use?
3. What is the commitment to integrated management on the policies?
4. What are the synergies and the conflicts amongst the existing policies?
5. How do we balance the economic and conservation needs of wetlands to achieve sustainable use of wetlands that ensures that both conservation and economic and livelihood development is achieved?
6. Community by-laws on wetlands
7. Conduct an action impact analysis of wetlands
8. A summary of policy failures and success in order to develop credible statements regarding the adequacy of policies
9. Policy implementation
 - a. The level and extent of policy implementation
 - b. The challenges in policy implementation
 - c. Incentives and or disincentives for policy implementation
10. How policies are clear on transboundary issues
11. Stakeholder involvement in policy development and implementation
12. The role of Environmental Impact Assessments and other regulatory measures on enhancing wetland conservation and sustainable use

5.6 SCENARIOS MAPPING FOR WETLANDS

- Look at the past present and future outlook of wetlands under different scenarios
- Assess human activities currently and anticipate those in future and how that would impact wetland biodiversity and ecosystem services
- Climate change scenarios under different trends and their impact on wetland biodiversity and ecosystem services
- Recommended under different scenarios

5.7. CLIMATE CHANGE AND WETLAND BIODIVERSITY AND ECOSYSTEM SERVICES

- Conduct a cause-effect-link on climate change and wetland biodiversity: Assess how the changes in climate have resulted in changes in wetlands both directly and the impact on life dependent on wetland and climate change, and on ecosystem good and services)

- Climate change and invasive alien species (Elephant Marsh and proliferation of prosopis)
- Wetlands as important ecosystems for mitigation of climate change and carbon sequestration
- Wetlands as important ecosystems for building resilience against impacts of climate change including flood mitigation
- Wetlands role in ecosystem based adaptation to climate change (Winter cropping –offseason farming)

5.8 BUSINESS AND WETLAND CONSERVATION AND SUSTAINABLE USE

- How are businesses benefiting from wetlands?
- How are business impacting wetlands?
- How are businesses contributing to the conservation and sustainable use of wetlands?

ISSUES REQUIRING STRATEGIC DIRECTION

- How to identify data holders and generate quality and useful data to support the assessment
- Have a central data bank for the wetland group –could be a drop box

CHAPTER 6– LINKAGES AMONG ECOSYSTEMS – A NEXUS ANALYSIS

CHAPTER 7 – CONCLUSIONS AND RECOMMENDATIONS

3.7. Proposed Workplan

The NEA Malawi will be led by the proposed work plan below. The work plan will indicate timelines and outputs for each stage of the assessment.

Activity	Task	Deliverable	YEAR 3				YEAR4				YEAR 5				YEAR 6
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Scoping	Approval of scoping report	Scoping report													
Dissemination	Develop Policy briefs and Conduct stakeholder feedbacks/ field feed back visits (ILK)	Policy briefs developed Field visits reports produced													
Expert Evaluation	Data & information collection	Data & inform collected													
Expert Evaluation	TWG meet to agree on data, info & sources	List of data type & sources													
Expert Evaluation	TWG meet to present data collected	Presented data & info													
Write workshops	Work session to draft expert evaluation report	Draft report													
Write workshops	Individual write-ups	Draft report													
Write workshops	TWG consolidate revised report	Draft report													
Write workshops	Validation of report	Validated report													
Submission	Submission of report	Final report													
Dissemination															

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ANNEXES

Annex 1: Criteria for Prioritizing Ecosystems for the Assessment

	Criteria	Guidance	Score
1	Ecological Significance	Very high significance on threatened/ endangered species and habitats (biodiversity) and critical ecosystem services	4
		High significance on biodiversity and ecosystem services	3
		Moderate significance on biodiversity and ecosystem services.	2
		Low significance or high uncertainty about the same.	1
		No or ecological insignificance.	0
2	Socio-economic Significance	Very high socio-economic significance. Significance on global biodiversity conservation agenda	4
		High socio-economic significance.	3
		Moderate socio-economic significance	2
		Potential to mobilize or save a low amount of resources. Approximately under 1 percent of current expenditure or needs	1
		Minimal scale of socio-economic significance	0
3	Likelihood of successful interventions	Very high likelihood of successful assessment and policy support. Broad political and social support to recommendations. No assessment operational challenges known. Strong expectation of success in interventions	4
		High likelihood of successful assessment. Sufficient political and social support. Assessment challenges are manageable. Relevant record of accessibility of information.	3
		Moderate likelihood of successful assessment due to limited availability of information and technical barriers. Limited commercial viability (if relevant). Limited record of accessibility to information.	2
		Low likelihood of successful assessment due to limited information accessibility or technical barriers.	1
		Virtually no chance of successful assessment under current methodological constraints.	0

based on the following parameters.

- i. Ecological Significance
- ii. Socio-economic Significance
- iii. Likelihood of successful intervention

Having sited the ecosystems, the platforms came up with tabulated scores for the sited ecosystems.

Annex 2: Wetlands Ecosystem Prioritization

			Wetlands of National Importance								
			Lake Chirwa	Elephant Marsh	Hara/Wowwe/Ngerenge	Bwanje	Vwaza Marsh	Kasint hula	Dwangwa	Mpasanjoka	
Criteria	Guidance	Score	12	12	7	6	9	8	9	6	
1	Ecological Significance	Very high significance on threatened/ endangered species and habitats (biodiversity) and critical ecosystem services	4	4	4	1	1	3	2	3	2
		High significance on biodiversity and ecosystem services	3								
		Moderate significance on biodiversity and ecosystem services.	2								
		Low significance or high uncertainty about the same.	1								
		No or ecological insignificance.	0								
2	Socio-economic Significance	Very high socio-economic significance. Significance on global biodiversity conservation agenda	4	4	4	4	3	3	3	4	2
		High socio-economic significance.	3								
		Moderate socio-economic significance	2								
		Low socio-economic significance.	1								
		Minimal scale of socio-economic significance	0								
3	Likelihood of successful assessment	Very high likelihood of successful assessment and policy support. Broad political and social support to recommendations. No assessment	4	4	4	2	2	3	3	2	2

	operational challenges known. Strong expectation of success in interventions									
	High likelihood of successful assessment. Sufficient political and social support. Assessment challenges are manageable. Relevant record of accessibility of information.	3								
	Moderate likelihood of successful assessment due to limited availability of information and technical barriers. Limited commercial viability (if relevant). Limited record of accessibility to information.	2								
	Low likelihood of successful assessment due to limited information accessibility or technical barriers.	1								
	Virtually no chance of successful assessment under current methodological constraints.	0								
	TOTAL SCORES		12	12	7	6	9	8	9	6

Annex 3: Terrestrial Ecosystems Prioritization

Prioritizing Criteria					
		Ecological Significance	Socio-economic Significance	Likelihood of successful assessment	
Mountains		4	4	4	12
Forests (graveyards, etc)		4	4	4	12
Riparian		3	3	4	10
National Parks & Wildlife		4	3	4	11
Agro-ecosystems		2	3	4	9

Subterranean		Data unavailabl e	Data unavailabl e	Data unavailabl e	0
					0
Mountains	Mulanje Mountain	4	4	4	12
	Nyika Plateau	4	4	4	12
	Zomba-Malosa Massif	4	4	4	12
	Dzalanyama Range	4	4	4	12
	Misuku Hills	4	4	4	12
	Livingstonia	3	3	3	9
	Michiru Mountain				0
	Ntchisi Mountain				0
	Chikangawa				0
	Dedza Mountain				0
					0
					0
Forests	Dedza Mountain FR				0
	Mulanje Mountain FR	4	4	4	12
	Misuku Hills				0
	Dedza-Salima Escarpment				0
	Matandwe Forest				
	Dzalanyama FR				
	Perekezi FR				
	Chimaliro FR				
	Kaning'ina FR				
	Ntchisi FR				
	Thuma FR				

Annex 4: Aquatic Ecosystems Prioritization

Lakes

Criteria	L. Malawi	L. Chilwa	L. Malombe	L. Chiuta	L. Kazuni
Ecological significance	4	4	4	3	4
Socio-economic significance	4	4	3	4	2
Likelihood of successful interventions	4	2	4	3	3
	12	10	11	10	9

Rivers

Criteria	Songwe	South Rukuru	Bua	Lilongwe	Diamp hwe	Shire	Mudi	Wovwe
Ecological significance	4	3	4	3	4	4	1	2
Socio-economic significance	4	4	3	4	4	4	4	4
Likelihood of successful interventions	3	3	1	4	4	4	4	4
	11	10	8	11	12	12	9	10

Dams

Criteria	Kamuzu I & II	Mulunguzi	Mudi	Mpira
Ecological significance	4	4	4	4
Socio-economic significance	4	4	4	3
Likelihood of successful interventions	4	4	4	4
	12	12	12	11

Swamps & Floodplains

Criteria	Elephant Marsh	Vwaza	Ndinde	Bana	Hara
Ecological significance	4	4	4	4	4
Socio-economic significance	3	4	3	3	4
Likelihood of successful interventions	4	4	4	2	4
	11	12	11	9	12

Lagoons

Criteria	Chia	Mpoto
Ecological significance	4	3
Socio-economic significance	4	3
Likelihood of successful interventions	4	2
	12	8

Annex 5: Guiding questions for the ILK Framing Workshops

- 1. How have you and your ancestors traditionally managed biodiversity and ecosystems in your local areas over the past years?**
 - 1.1. What kind of biodiversity and ecosystems were available in the previous years?
 - 1.2. What traditional ways were you using to conserve them in your village?
 - 1.3. Are these traditional ways still being practiced now?

- 2. What are the most important factors affecting the contribution of your local knowledge to traditionally manage your ecosystems?**
 - 2.1. From your time what have been the changes over the years that have affected your traditional knowledge and practices in the management of these ecosystems?
 - 2.2. How have this knowledge and practices been transferred to the young generation? Do you see the younger generations using this knowledge and practices? Are you concerned? What are you doing about it?
 - 2.3. What can be done to make sure that the traditional practices and local knowledge in the management of ecosystems are being sustained?

- 3. What traditional governance systems have been in place over the years to support the management of biodiversity and ecosystems?**
 - 3.1. Were the traditional knowledge and practices used to conserve biodiversity and ecosystems back then recognized by government policies? How about now?
 - 3.2. What was the role of traditional leaders in conserving biodiversity and ecosystem in a traditional way in the previous years? Are these roles still applicable in the present years?
 - 3.3. What should be done to ensure that local knowledge is utilized in the management of ecosystems in your area and the country at large?

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