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Report No: PAD3542

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON

A PROPOSED CREDIT

IN THE AMOUNT OF SDR 57.1 MILLION  
(US\$78.5 MILLION EQUIVALENT)

AND

A PROPOSED IDA GRANT

IN THE AMOUNT OF SDR 57.1 MILLION  
(US\$78.5 MILLION EQUIVALENT)

TO THE

REPUBLIC OF MALAWI

FOR THE

MALAWI WATERSHED SERVICES IMPROVEMENT PROJECT

May 28, 2020

Water Global Practice  
Africa Region

This document is being made publicly available prior to Board consideration. This does not imply a presumed outcome. This document may be updated following Board consideration and the updated document will be made publicly available in accordance with the Bank's policy on Access to Information.

## CURRENCY EQUIVALENTS

(Exchange Rate Effective January 31, 2020)

Currency Unit = Malawi Kwacha (MWK)

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US\$1 = 740 MWK

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US\$ 1= SDR 0.72624278

## FISCAL YEAR

July 1 – June 30

Regional Vice President: Hafez M. H. Ghanem

Country Director: Mara K. Warwick

Regional Director: Ede Jorge Ijjasz-Vasquez

Practice Manager: Catherine Signe Tovey

Task Team Leaders: Josses Mugabi, Meeta Sehgal, Nigel Ross Hughes

## ABBREVIATIONS AND ACRONYMS

AEDO	Agricultural Extension Development Officer
AgCOM	Agriculture Commercialization Project
AGM	Annual Grant Multiplier
APA	Annual Performance Assessment
APPS	Assistant Project Procurement Specialist
BWB	Blantyre Water Board
CECF	Community Environmental Conservation Fund
CEO	Chief Executive Officers
CIG	Common Interest Group
CMC	Catchment Management Committee
COVID-19	Coronavirus disease of 2019
CPF	Country Partnership Framework
CRWB	Central Region Water Board
CS	Consulting Services
CSA	Climate-Smart Agriculture
CSO	Civil Society Organization
DADO	District Agriculture Development Officers
DAES	Department of Agricultural Extension Services
DAHLD	Department of Animal Health and Livestock Development
DCCMS	Department of Climate Change and Meteorological Services
DC	District Council
DCD	Department of Crop Development
DDR	Detailed Design Report
DLGS	Department of Local Government Services
DLRC	Department of Land Resources Conservation
DNPW	Department of National Parks and Wildlife
DoF	Department of Forestry
Dol	Department of Irrigation Services
DoRD	Department of Rural Development
DoS	Department of Surveys
E&S	Environmental and Social
EAD	Environmental Affairs Department
EGENCO	Electricity Generation Company
EHS	Environmental, Health and Safety
EPA	Extension Planning Areas
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plans
FA	Financing Agreement
FAO	Food and Agriculture Organization

FDMF	Forest Development and Management Fund
FFS	Farmer Field School
FISP	Farm Input Subsidy Programme
FM	Financial Management
FMS	Financial Management Specialist
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GNI	Gross National Income
GoM	Government of Malawi
GRS	Grievance Redress Service
ICOLD	International Commission on Large Dams
ICR	Implementation Completion and Results Report
IDA	International Development Association
IE	Impact Evaluation
IFMIS	Integrated Financial Management Information System
IFR	Interim Financial Reports
IG	Innovation Grant
IPDC	Internal Procurement and Disposal Committee
IPF	Investment Project Financing
LMP	Labour Management Procedures
LRIU	Land Reform Implementation Unit
LSWI	Land Surface Water Index
LUANAR	Lilongwe University of Agriculture and Natural Resources
LWB	Lilongwe Water Board
M&E	Monitoring and Evaluation
MFD	Maximizing Finance for Development
MG	Matching Grant
MGDS	Malawi Growth and Development Strategy
MoAFS	Ministry of Agriculture and Food Security
MoE	Ministry of Energy
MoETW	Ministry of Environment, Tourism and Wildlife
MoIWD	Ministry of Irrigation and Water Development
MoLHUD	Ministry of Lands, Housing and Urban Development
MoNRM	Ministry of Natural Resources and Mining
MWASIP	Malawi Watershed Services Improvement Project
MTR	Mid Term Review
NCS	Non-Consulting Services
NDVI	Normalized Difference Vegetation Index
NFLRA	National Forest Landscape Restoration Assessment
NFLRS	National Forest Landscape Restoration Strategy
NGO	Non-Governmental Organizations
NPWF	National Parks and Wildlife Fund
NWRA	National Water Resources Authority

O&M	Operation and Maintenance
OC	Operating Cost
PBG	Performance-Based Grant
PDO	Project Development Objective
PDU	Procurement and Disposal Unit
PF	Process Framework
PIM	Project Implementation Manual
PIU	Project Implementation Unit
PMS	Project Management Support
PMU	Program Management Unit
PPSD	Project Procurement Strategy for Development
PS	Principal Secretary
PPS	Project Procurement Specialist
PSC	Project Steering Committee
PTC	Project Technical Committee
PWS	Payment for Watershed Services
RA	Roads Authority
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SCD	Systematic Country Diagnostic
SEP	Stakeholder Engagement Plan
SLM	Sustainable Landscape Management
SoP	Series of Projects
SORT	Systematic Operations Risk-rating Tool
SPDs	Standard Procurement Documents
SRBMP	Shire River Basin Management Project
SRWB	Southern Region Water Board
STEP	Systematic Tracking of Exchanges in Procurement
T/W	Training and Workshops
TA	Technical Assistance
ToR	Terms of Reference
TT	Multisectoral Technical Team
TTL	Task Team Leader
UAV	Unmanned Aerial Vehicle
VLAP	Village Level Action Plan
VNRMC	Village Natural Resource Management Committee
WB	World Bank
WHO	World Health Organization
WRAs	Water Resource Areas
WRIS	Water Resources Investment Strategy
WUAs	Water-User Associations

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## DATASHEET

## BASIC INFORMATION

Country(ies)	Project Name	
Malawi	Malawi Watershed Services Improvement Project	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P167860	Investment Project Financing	Substantial

## Financing &amp; Implementation Modalities

<input type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input checked="" type="checkbox"/> Series of Projects (SOP)	<input type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Performance-Based Conditions (PBCs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	

Expected Approval Date	Expected Closing Date
19-Jun-2020	30-Sep-2026

Bank/IFC Collaboration

No

## Proposed Development Objective(s)

Increase adoption of sustainable landscape management practices and improve watershed services in targeted watersheds

## Components

Component Name	Cost (US\$, millions)
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Scaling up Landscape Restoration	53.00
Improving Watershed Services	82.00
Technical and Project Management Support	25.00

### Organizations

Borrower: Republic of Malawi

Implementing Agency: Ministry of Irrigation and Water Development

### PROJECT FINANCING DATA (US\$, Millions)

#### SUMMARY

<b>Total Project Cost</b>	160.00
<b>Total Financing</b>	160.00
<b>of which IBRD/IDA</b>	157.00
<b>Financing Gap</b>	0.00

#### DETAILS

##### World Bank Group Financing

International Development Association (IDA)	157.00
IDA Credit	78.50
IDA Grant	78.50

##### Non-World Bank Group Financing

Counterpart Funding	3.00
Borrower/Recipient	3.00

#### IDA Resources (in US\$, Millions)

	Credit Amount	Grant Amount	Guarantee Amount	Total Amount
Malawi	78.50	78.50	0.00	157.00
National PBA	78.50	78.50	0.00	157.00



<b>Total</b>	<b>78.50</b>	<b>78.50</b>	<b>0.00</b>	<b>157.00</b>
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**Expected Disbursements (in US\$, Millions)**

WB Fiscal Year	2020	2021	2022	2023	2024	2025	2026	2027
Annual	0.37	9.24	17.99	26.02	35.07	32.11	24.89	11.31
Cumulative	0.37	9.61	27.60	53.62	88.69	120.80	145.69	157.00

**INSTITUTIONAL DATA****Practice Area (Lead)**

Water

**Contributing Practice Areas**

Agriculture and Food, Environment, Natural Resources &amp; the Blue Economy, Urban, Resilience and Land

**Climate Change and Disaster Screening**

This operation has been screened for short and long-term climate change and disaster risks

**SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)**

Risk Category	Rating
1. Political and Governance	● Substantial
2. Macroeconomic	● Substantial
3. Sector Strategies and Policies	● Moderate
4. Technical Design of Project or Program	● Substantial
5. Institutional Capacity for Implementation and Sustainability	● Substantial
6. Fiduciary	● Substantial
7. Environment and Social	● Substantial
8. Stakeholders	● Substantial
9. Other	
10. Overall	● Substantial

**COMPLIANCE****Policy**

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes    [✓] No

Does the project require any waivers of Bank policies?

[ ] Yes    [✓] No

**Environmental and Social Standards Relevance Given its Context at the Time of Appraisal**

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Relevant
Financial Intermediaries	Not Currently Relevant

**NOTE:** For further information regarding the World Bank's due diligence assessment of the Project's potential environmental and social risks and impacts, please refer to the Project's Appraisal Environmental and Social Review Summary (ESRS).

**Legal Covenants**

Sections and Description



Financing Agreement. Schedule 2, Section I.A.1. The Recipient shall maintain at all times during the implementation of the Project, the Project Steering Committee with a mandate, composition, and resources satisfactory to the Association and responsible, at the national level, for facilitating intersectoral collaboration, providing overall strategic and policy guidance and oversight of Project implementation.

#### Sections and Description

Financing Agreement. Schedule 2, Section I.A.2. The Recipient shall maintain at all times during the implementation of the Project, the Project Technical Committee, with a mandate, composition, and resources satisfactory to the Association and responsible for providing technical guidance for the Project.

#### Sections and Description

Financing Agreement. Schedule 2, Section I.A.3 (a). The Recipient shall maintain at all times during the implementation of the Project, the Multi-sector Technical Team with a mandate, composition, and resources satisfactory to the Association and responsible for the day-to-day implementation of the project, including Project management, flow of funds, central procurements and operational support. Without limitation to the previous paragraph, the Multi-sector Technical Team/Program Management Unit shall inter alia include an environmental specialist and a social specialist.

#### Sections and Description

Financing Agreement. Schedule 2, Section I.A.4. For purposes of verification of the achievement of the performance targets under Part 1.1(a), Part 1.1(b), Part 2.1 and Part 2.2 (b) of the Project, the Recipient shall, through Ministry of Irrigation and Water Development (MoIWD), not later than nine (9) months from the Effective Date, appoint and, thereafter maintain, an independent verification agent, under terms of reference and with qualifications and experience acceptable to the Association.

#### Sections and Description

Financing Agreement, Schedule 2, Section II.2. The Recipient shall develop and implement no later than December 29, 2023, or such later date that the Association may agree to, and, in accordance with terms of reference satisfactory to the Association, a biophysical and ecological monitoring system to track changes in target watersheds as a result of Project interventions.

#### Sections and Description

Financing Agreement, Schedule 2, Section I.A.3(b). The Recipient shall not later than nine (9) month after the Effective Date, recruit and thereafter maintain throughout Project implementation, a financial management specialist, a Project management specialist, a procurement specialist, an assisting procurement specialist; and two (2) environmental and social consultants; each of those with qualifications, experience, and terms of reference acceptable to the Association.

#### Conditions

Type	Description
Disbursement	Financing Agreement, Schedule 2, Section III.B.1(b). No withdrawal shall be made under Category (2) unless and until: (i) at least five (5) PBG Agreements have been signed between



	the Recipient and PBG Beneficiaries; (ii) at least one CECF Agreement has been signed between the Recipient and CECF; and (iii) a Verification Agent has been hired, in accordance with Section I.A.4 of Schedule 2 to this Agreement.
Type Effectiveness	Description The Recipient has adopted the Project Implementation Manual in accordance with Section I.B of Schedule 2 of the Financing Agreement.



## I. STRATEGIC CONTEXT

### A. Country Context

1. **Malawi is a small, peaceful, and democratic country with a population of about 17 million people.** Most of the people (85 percent) live in rural areas. The population growth rate is 2.8 percent per annum. At this growth rate, Malawi's population will reach 23 million by 2025. The country is land-locked and is highly vulnerable to climatic shocks. Despite a recent difficult economic period, Malawi has a stable democratic political system and has initiated economic and political reforms.
2. **Over half of Malawi's population is living in poverty.** In 2017, the poverty headcount, based on US\$1.90/day (2011 Purchasing Power Parity) threshold, remained high at 70 percent<sup>1</sup>. Gross National Income (GNI) per capita was US\$320 in 2017. Malawi is ranked 170 out of 188 countries on the United Nations Human Development Index and 125 out of 157 on the World Bank's Human Capital Index. Malawi's economic growth rate has fallen below the average of 2.8 percent among non-resource rich African countries during the last twenty years. Real Gross Domestic Product (GDP) per capita has grown at an average of just above 1.5 percent per year between 1995 and 2014. With these persistent low growth rates, successive governments in Malawi have struggled to lift people out of poverty. Wealth accounting data<sup>2</sup> shows that more than half of Malawi's wealth (estimated at US\$10,442 per capita in 2014) is renewable natural capital, mostly cropland with smaller shares contributed by pastureland, forests, and protected areas. The natural capital base, however, is under extreme pressure due to population growth, agricultural expansion and climate change.<sup>3</sup>
3. **Natural resources underpin Malawi's productive sectors and are the primary source of livelihood for over 80 percent of the population.** For instance, water-reliant sectors of the economy contribute an estimated 35 percent of the country's GDP. The agriculture sector contributes 28 percent of Malawi's GDP and 78 percent of export earnings and employs 64 percent of the workforce, which consists mainly of subsistence farmers. Smallholder farmers account for 80 percent of agricultural production and 70 percent of agricultural GDP. The forestry sector contributes 6.2 percent to the GDP (and this does not account for the value of non-wood forest products, processed timber, or the enormous informal trade in wood fuel and charcoal). Some 33,000 jobs are heavily dependent on the existence of Malawi's forests. Forests provide a range of environmental services, such as greenhouse gas (GHG) mitigation, watershed regulation, climate regulation, soil and water conservation, biodiversity support, and nutrient cycling. The nine protected areas in the Shire River Basin store an estimated 80 million tons of Carbon dioxide equivalent (CO2e)<sup>4</sup>. Malawi is also heavily dependent on hydropower for its energy needs, with about 98 percent (358 megawatts) of current electricity generation coming from run-of-river<sup>5</sup> hydropower plants on the Shire River.
4. **Agriculture remains the lifeblood of Malawi's economy, and growth in GDP has historically followed growth in agriculture.** The sector regularly suffers exogenous climate change-induced shocks with significant negative impacts on overall growth and poverty reduction. Moreover, in recent years, weak fiscal policy, low investor confidence, significant weather shocks exacerbated by climate change, and land degradation have had

<sup>1</sup> World Bank (2017). Malawi Economic Monitor – Unleashing the Urban Economy, Macroeconomics and Fiscal Management Global Practice, Washington, DC: The World Bank.

<sup>2</sup> Lange et al. (2018). The Changing Wealth of Nations 2018: Building a Sustainable Future. Washington, DC: World Bank

<sup>3</sup> World Bank (2018). Malawi Country Environmental Analysis. Washington, DC: World Bank

<sup>4</sup> Bayliss (2015). Carbon Storage Analysis of select Protected Areas under the SRBMP. Report to Government of Malawi

<sup>5</sup> 'Run-of-river' means that there is little or no storage capacity upstream of the power plant except small pondage for peaking. The amount of electricity that can be produced depends on the daily flow of the river.



detrimental effects on agricultural output and food security. Malawi regularly suffers from droughts and floods. In recent years, the country has experienced weather shocks with increasing frequency, including both floods and droughts in 2015, 2016, and, more recently, in 2018. Irrigation potential is underdeveloped. Only about four percent of cropland is currently irrigated, severely constraining agricultural intensification and commercialization.

**5. The COVID-19 pandemic has dampened Malawi's medium-term growth prospects.** After two consecutive years of droughts, real GDP growth fell to 3.5 percent in 2018, but recovered slightly to 4.4 percent in 2019. The recovery was mainly driven by a rebound in the agriculture sector. With a good harvest for a second consecutive year, the economy was on a trajectory for a third year of faster growth in 2020. However, the COVID-19 pandemic is likely to impact economic activity through disruptions of global value chains affecting importation of key production inputs, decrease in tourism, and reduced demand for export products. Malawi confirmed its first case of COVID-19 on April 2, 2020 and as of May 21, 2020, the cases had increased to 72. Domestic risk aversion and social distancing measures to contain the spread of the virus are likely to constrain domestic demand, affecting investment and further weigh on growth. The pandemic also threatens food security and livelihoods. While global markets for food staples are well supplied and prices remain relatively stable, risks to food security at country level remain high, with potential widespread income losses and disruption in domestic food supply chains. Given these issues, Malawi's medium-term growth projections are highly uncertain and are evolving as the pandemic situation develops. Real GDP growth projection for 2020 has been revised downwards to two percent, on the assumption that Malawi will not experience a widespread outbreak of the pandemic, and global value chain disruptions will not persist beyond 2020. However, risks are still heavily tilted to the downside, and growth projections could reduce further.

**6. The continued vulnerability of Malawi's economy points to the critical need to improve resilience.** The Government of Malawi (GoM) has recently developed a medium-term growth strategy<sup>6</sup>, looking beyond recent crises, to establish strong foundations for a productive, competitive, and resilient nation. The proposed project supports GoM's strategy while also helping to mitigate COVID-19 related impacts on livelihoods.

## B. Sectoral and Institutional Context

**7. Malawi's water resources are under threat from severe land degradation and loss of forest cover.** Critical watersheds are becoming degraded, leading to reduced water availability, deteriorating water quality, increased vulnerability to droughts and floods, reduced energy security, and reduced agricultural productivity. Malawi has an extensive network of surface water bodies covering about 21 percent of the country's total area; about 20 percent of this area is Lake Malawi itself. Malawi's drainage system consists of 17 water resources areas (WRAs)<sup>7</sup>. Major river systems include Shire (WRA 1), Ruo (WRA 14), Linthipe (WRA 4), Bua (WRA 5), Dwangwa (WRA 6), South Rukuru (WRA 7), North Rukuru (WRA 8) and Songwe (WRA 9). Most of the rivers are subject to natural seasonal flows but maintain at least some base flow (at least in their lower reaches) throughout the dry season. The total estimated renewable water resource available in Malawi is about 17.3 km<sup>3</sup>/year or 1,027 m<sup>3</sup>/capita/year. While the availability of water resources in the aggregate is considered satisfactory, per capita water availability has been declining at a rapid rate due to population growth. Malawi is now dangerously close to becoming water scarce<sup>8</sup>. Further, water resources in Malawi are highly variable between wet and dry

<sup>6</sup> Government of Malawi (2017). Malawi Growth and Development Strategy (2017-2022: Building a Productive, Competitive and Resilient Nation. Lilongwe: Government of Malawi

<sup>7</sup> A Water Resources Area is essentially a single large, or in some cases a collection of smaller, hydrological catchments.

<sup>8</sup> Under the Falkenmark definitions of water scarcity, a country with a total renewable water resource of less than 1000 m<sup>3</sup>/capita/year is considered water scarce



seasons and from year to year, and the country's stock of water storage infrastructure is one of the lowest in the region. GoM's Water Resources Investment Strategy (WRIS, 2011) identifies poor catchment conditions and deteriorating water quality as significant risks to water resources and associated infrastructure (dams, hydropower plants, irrigation systems), and recommends investments in catchment management in critical river basins.

**8. Land degradation<sup>9</sup> in Malawi's most important watersheds has reached alarming levels, with significant impacts on water security, agricultural productivity, and hydropower generation.** Recent studies suggest that land degradation hotspots cover about half (41 percent) of the land area in the country<sup>10</sup>. Soil erosion and nutrient depletion are severe forms of land degradation that affect more than 60 percent of the entire land area. The average annual national soil loss rate in 2014 was 29 tons per hectare<sup>11</sup>. Chemical land degradation, including soil pollution and salinization/alkalization, has led to a 15 percent loss in the arable land in Malawi in the last decade alone. Projections for future land degradation and soil loss under different climate and population growth rate scenarios suggest that land degradation will become increasingly severe, with one study suggesting that overall rates of soil loss will increase by three to four times 2010 baseline levels<sup>12</sup>. The Shire River Basin remains the most prominent hotspot of land degradation. High loads of sediment deposited in riverbeds, reservoirs, and floodplain wetlands, affect irrigation canals, fisheries, and hydropower generation. Existing hydropower plants on the Shire River are often unable to meet peak demand, partly due to low flows and sediments in the river caused by the degradation of catchments upstream of the plants<sup>13</sup>.

**9. Forest degradation is a significant contributor to land and water resources degradation.** Over the last 40 years, more than half of Malawi's forests and woodlands have vanished, and those that remain are being 'thinned' through over-extraction and more frequent forest fires. Yet, forests make a substantial contribution to livelihoods and the economy and are needed to protect vital ecosystem services. They also provide the bulk of Malawi's energy supply in the form of charcoal and firewood. Wood fuels dominate Malawi's energy sector, with 98 percent of the population dependent on wood fuels for their energy needs. The wood fuels industry provides large numbers of jobs and is worth nearly US\$295 million per annum – equivalent to four percent of GDP<sup>14</sup>. Forests and woodlands also play a crucial role in protecting watersheds from erosion, sustaining the biodiversity that underpins a large proportion of Malawi's tourism sector and making an essential contribution to mitigating carbon emissions.

**10. The underlying drivers of land degradation in Malawi are well known.** These include growing demand for agricultural land and wood fuels associated with an increasing population; imperfect knowledge about sustainable farming practices; insecure land tenure, which reduces incentives to invest in soil and water conservation measures; and limited access to markets and rural finance. The proximate causes of land degradation include a wide range of biophysical factors and poor land management practices. Important biophysical factors that affect land degradation include topography, land cover, climate change and soil erodibility.

<sup>9</sup> Defined here as: "the reduction or loss of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or range, pasture, forest or woodlands resulting from natural processes, land uses or other human activities and habitation patterns such as land contamination, soil erosion and the destruction of the vegetation cover"

<sup>10</sup> MoNREM (2017). Forest Landscape Restoration Opportunities Assessment of Malawi. Lilongwe, Ministry of Natural Resources, Energy and Mining, Government of Malawi.

<sup>11</sup> Vargus R. and Omuto, C. (2016). Soil Loss Assessment in Malawi. FAO, UNEP and UNDP. Available at [http://unpei.org/sites/default/files/Soil\\_Loss\\_Assessment\\_in%20Malawi.pdf](http://unpei.org/sites/default/files/Soil_Loss_Assessment_in%20Malawi.pdf) [accessed on November 20, 2018]

<sup>12</sup> LTS (2013). Integrated Assessment of Land Use Options in Malawi. Report to the World Bank and Government of Malawi

<sup>13</sup> In 2017, Malawi's power generation utility (EGENCO) spent around US\$150,000 per ton on sediment management to enable operation of the hydropower facilities.

<sup>14</sup> World Bank (2018). Malawi Country Environmental Analysis. World Bank, October 2018



11. **A multitude of factors hampers efforts to address land degradation.** The major challenge is the weak institutional capacity for natural resource management at both national and local levels and the severe lack of funding for these activities in local government budgets. With insufficient resources, weak capacity, and incentives, local governments are generally unable to play an active role in addressing land degradation at the local level. Also, changes to climate and weather patterns exacerbate the impacts of natural resources degradation, making it harder to solve the problem. Future climate change scenarios suggest that Malawi will see increasing climatic variability, higher temperatures, more extended dry periods, and more erratic and intense rainfall events<sup>15</sup>. More extreme flood events will cause more significant soil erosion and land degradation, increased sedimentation in the rivers and deteriorating water quality. Hotter and drier periods will contribute to forest fire risks. Droughts will continue to negatively impact food production, causing food insecurity and increased poverty. Increased poverty results in higher demand for agricultural land, thus exerting more pressure on the natural resources base. However, Malawi remains unprepared to anticipate and respond to the effects of climate change. While GoM has made some investments in revamping the country's most critical hydrological and meteorological monitoring network (especially within the Shire River Basin)<sup>16</sup>, operation and maintenance of the systems remain a challenge due to limited budgets. Moreover, there is still limited technical capacity to convert hydro-meteorological data into useful climate information products and services needed for building resilience.

12. **Reversing the rate of land degradation remains a government priority.** The Ministry of Agriculture and Food Security (MoAFS), the Ministry of Irrigation and Water Development (MoIWD), the Ministry of Environment, Tourism and Wildlife (MoETW) and the Ministry of Natural Resources and Mining (MoNRM) all recognize the interdependence between natural resource management, agricultural production, water and energy security. Sound policies and institutional frameworks for natural resources management exist. The Water Resources Act of 2013 provides for the management, conservation, use, and control of water resources, including the management of watersheds. The recently established National Water Resources Authority (NWRA)<sup>17</sup> will help strengthen multi-sectoral planning and management of water resources in the country and pave the way for the establishment of sustainable watershed management institutions at the community level. Land reforms introduced in 2016 are improving land tenure security and strengthening incentives for small-holder farmers and businesses to invest in sustainable land and water management practice. A new Environmental Management Act was enacted in 2017 to enhance environmental management and protection.

13. Further, a new national charcoal strategy has been approved, which for the first time, provides an opportunity to legalize the charcoal value chain and move towards more sustainable charcoal production, and thus reducing pressure on forests and community woodlands. However, the ability to implement policy and legislation, both nationally and locally, remains weak. Monitoring is often limited and ineffective, compliance is low, and the structures necessary for providing guidance and procedures are not in place. Inadequate institutional capacity is particularly acute at the district level, partly because of the slow pace of decentralization and severe under-funding<sup>18</sup>, which constrains the effective functioning of institutions at that level, limiting their ability to implement policy.

<sup>15</sup> Government of Malawi (2017). Strategic Program for Climate Resilience: Pilot Program on Climate Resilience (PPCR).

<sup>16</sup> A network of 100 hydromet monitoring stations (75 meteorological and 25 hydrological) across the basin has recently been revamped as part of SRBMP. Plus, modern hydromet equipment and associated software have been installed to enable access to hydromet data in near real time. More investments in network expansion are underway under M-CLIMES project implemented by UNDP.

<sup>17</sup> GoM recently appointed the governing board for NWRA – a move that is seen as an important milestone in operationalizing the institutional framework for water resources management as laid out in the Water Resources Act of 2013.

<sup>18</sup> For instance, the share of agricultural spending on extension support – a critical service for promoting the uptake of SLM practices – reduced from 25 percent in 2005 to just 5 percent in 2012.



14. **To reverse landscape degradation and protect watersheds, Malawi needs to invest at scale in the protection of renewable natural resources and their restoration, where appropriate and cost-effective, using a broad suite of interventions.** At the same time, GoM needs to invest in strengthening watershed management institutions and maximizing the benefits that people and communities obtain from managing watersheds sustainably. GoM's National Forest and Landscape Restoration Strategy (NFLRS), published in July 2017, proposes to elevate landscape restoration to a higher national priority level, backed by financial investment to implement a large-scale nationwide program for land restoration. In this regard, GoM has committed to restoring 4.5 million ha<sup>19</sup> of the degraded landscapes by 2030 through a combination of interventions, including soil and water conservation, river and stream bank restoration, conservation agriculture, farmer-managed natural regeneration, and agroforestry; natural forest management; community forests and private woodlots. The total estimated cost of achieving this target is US\$385 million (or US\$86 per hectare). GoM is currently in the process of mobilizing finance from development partners to support the implementation of the strategy, either through a new large-scale national program or a series of separate programs targeting major river basins.

15. **One such program which GoM (through MolWD) has been implementing since 2012 with World Bank support is the Shire River Basin Management Program (SRBMP, P117617)<sup>20</sup>.** Part of the investment under SRBMP targeted four degraded catchments in the basin, covering a total area of 129,500 ha (about 5 percent of the basin land area). These catchments have undergone rehabilitation over the past three years with promising results. At the end of 2018, a total of 35,385 ha (i.e., 27 percent of the targeted catchment area and 1.3 percent of the entire basin) was rehabilitated, including 10,173 ha of previously degraded community forests.<sup>21</sup> Further, through this program, MolWD (i) restored vegetative riparian buffer zones on approximately 4,000 km of watercourses (rivers and streams) in the targeted catchments; (ii) delivered various infrastructure services—i.e., 80 km of rural feeder roads, 11 bridges, and 13 markets—to support alternative livelihoods and improve market access; (iii) established and trained 366 common interest groups (CIGs) and provided them with start-up capital for various non-farm business enterprises; and (iv) established 80 farmer field schools (FFS) which are still active in promoting conservation agriculture and improved farming practices using a farmer-to-farmer extension approach. These results, although achieved at a small scale, demonstrated that it is possible to restore degraded landscapes through an integrated package of interventions involving land and water management, forestry management and livelihood support. GoM would like to scale up these interventions in other degraded hotspots in the Shire River Basin and elsewhere and has requested the World Bank to support a series of projects aligned with the national landscape restoration strategy<sup>22</sup>. The proposed **Malawi Watershed Services Improvement Project (MWASIP)** is the first in the series of projects designed to support GoM's landscape restoration efforts.

### C. Relevance to Higher Level Objectives

16. **The project aligns well with the new Country Partnership Framework (CPF) for Malawi which is currently under preparation.** The CPF is expected to focus on six strategic objectives, two of which are: Agriculture for Growth and Jobs; and Tackling Key Infrastructure Challenges. The latter objective will include a holistic approach to land management to build physical resilience and boost environmental and rural resilience. The project contributes to both these objectives, by helping to boost sustainable agricultural production, protect critical watersheds, and secure water resources for existing and proposed hydropower plants on the Shire River, as well as for Malawi's biggest irrigation scheme currently under implementation as part of

<sup>19</sup> This represents about half of the entire land area in Malawi

<sup>20</sup> World Bank support to SRBMP ended on January 31, 2019

<sup>21</sup> World Bank (2019). Shire River Basin Management Project. Implementation Completion Report, June 2019.

<sup>22</sup> GoM requested World Bank support through a letter dated June 28, 2017



the Shire Valley Transformation Program (P158805). Moreover, the project's interventions, particularly land and forest restoration, water infrastructure and climate information services, will help build resilience to climate variability for both farmers and the ecosystems in the watershed, and lower the risk and impacts of droughts and floods.

17. **The project also contributes to the human capital agenda in Malawi.** A recent study<sup>23</sup> found that upstream watershed conditions were a strong predictor of children's health across 35 developing countries, including Malawi. Specifically, the study found that in areas with no access to improved water sources, higher upstream tree cover is associated with a lower probability of diarrheal diseases downstream, even after controlling for socio-economic and climate factors<sup>24</sup>. This finding suggests that improving watershed management is not only an investment in environmental resilience; it is also an investment in public health.

18. **The project responds directly to GoM's priorities as laid out in the Malawi Growth and Development Strategy (MGDS III) 2017-2022.** The objective of the strategy is to make Malawi a more productive, competitive, and resilient nation through sustainable agriculture and economic growth, energy, industrial and infrastructure development while addressing water, climate change, environmental management and population challenges. The project contributes directly to the MGDS III priority areas of agriculture, water development, and climate change management by supporting investments that address land degradation and its impacts on water resources, agricultural productivity and rural resilience. Given the critical role that water plays in Malawi's economy, and given that the country's wealth is still primarily dominated by natural resources (largely cropland), future growth will depend on reversing land degradation to improve productivity, and sustainable management of natural capital (especially forests) to protect water security.

19. **The project contributes to the World Bank Group's twin goals of ending extreme poverty and promoting shared prosperity.** The project area targets the most impoverished region of Malawi, where rural poverty rates are above 80 percent. A recent study<sup>25</sup> shows a strong correlation between regions with highly degraded land and those with a high incidence of poverty, implying that increasing levels of land degradation may be contributing to the poverty of millions of Malawians. The project will contribute to reversing this trend.

20. **The project will contribute to Malawi's COVID-19 response and recovery efforts by improving livelihoods and building rural resilience.** Within the first three years, the project will provide rapid livelihood support to over 250,000 beneficiaries in rural communities through various grant schemes that are designed to incentivize better land stewardship. Of particular interest for enabling rapid COVID-19 response, are the grant transfers to existing Community Environmental Conservation Funds (CECFs) to provide micro-credits to community members linked to adoption of sustainable landscape management practices and the matching grants to farmers groups and agri-enterprises (including input providers, buyers, processors, and aggregators) to enhance agriculture-based livelihoods, with particular focus on female farmers and agri-entrepreneurs. In addition to the grants, the project will finance water infrastructure<sup>26</sup> and services (including 10 small multipurpose dams, 20 rainwater harvesting structures, 10 small-scale irrigation schemes) to improve water availability and reliability for production. Construction of this infrastructure will create approximately 2,500 jobs and give people the chance to work and earn, thus providing immediate benefits for communities.

<sup>23</sup> Herrera, D. et al (2016). Upstream watershed condition predicts rural children's health across 35 developing countries. *Nature communications*, Vol 8, 811 (2017).

<sup>24</sup> This finding is consistent with other literature on the role of forests in regulating water quality.

<sup>25</sup> World Bank (2018). Malawi Country Environmental Analysis, Washington DC, World Bank

<sup>26</sup> Some of these investments (irrigation schemes) were prepared up to detailed design under the previous project (SRBMP).



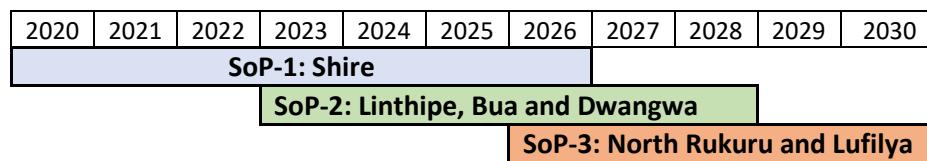
## II. PROJECT DESCRIPTION

21. **The project is the first in a ‘Series of Projects’ (SoP) aimed at supporting the implementation of the NFLRS.** The NFLRS estimates that nearly 7.7 million ha of degraded land (about 80 percent of Malawi’s total land area) requires restoration intervention. The NFLRS target is to restore 4.5 million ha of the degraded landscape by 2030. GoM’s vision is to leverage World Bank support in a manner that aligns with NFLRS. Given the scale of land degradation and the need to build strong institutions and financing mechanisms needed to achieve NFLRS targets, a long-term partnership between the World Bank and GoM is crucial. This partnership is operationalized through a SoP. The SoP approach signals the commitment of both parties to a programmatic set of investments, with sustained support contingent on overall implementation performance and achievement of results. The SoP approach is justified for several reasons. First, it incentivizes GoM to stay focused on reversing land degradation. Second, it allows for long term support on institutional strengthening, which is critical for sustainability. Finally, it provides an opportunity for evidence-based learning and enables GoM to demonstrate the long-term impact of the interventions on energy and water security, agricultural productivity and livelihoods.

22. **The program will consist of three investment project financing (IPF) operations targeting different priority river-basins with a duration of six years each and a three to four year overlap between each project, as illustrated in Figure 1.** The three-year overlap is necessary to accelerate progress towards the restoration goals set in the NFLRS. A common theme across the three projects is strengthening institutions and financing mechanisms needed to sustain interventions beyond each project.

23. **The overarching Program Development Objective is to restore degraded landscapes in priority river basins and improve water security, agricultural productivity and livelihoods.** At the end of the 11-year program, tangible results would include: (i) strengthened capacity of key watershed management institutions at national and local levels; (ii) restoration of at least 50 percent of degraded landscapes in priority catchments within the three target river basins; (iii) at least 30 percent reduction in sediment yield in selected rivers and tributaries; (iv) about 400,000 people gaining access to water for productive use; (v) 70 percent increase in agricultural productivity; and (vi) at least 15 percent increase in household incomes. The total notional envelop for the SoP is estimated in the range of US\$350–US\$600 million, depending on the size of the enabling infrastructure package in each project.

**Figure 1:** Illustration of the Proposed SoP



24. **This project (SoP-1) allows GoM to scale up landscape restoration interventions in the Shire River Basin (WRA-1), while at the same time maximizing the benefits people and communities obtain from managing watersheds sustainably (i.e., watershed services) as the basis for building the institutional and financing mechanisms needed to sustain interventions beyond the project.** The upper and middle parts of the Shire River Basin alone provide the opportunity to restore more than 2.6 million ha of degraded landscape. This value represents more than half (57 percent) of the NFLRS target. The Shire River Basin is, therefore, a priority watershed for achieving GoM’s strategic goals as laid out in the NFLRS and will, therefore, require continuing restoration intervention beyond this project. The estimated project cost is US\$160 million. This cost will be



financed through an IDA credit of US\$78.5 million equivalent, an IDA Grant of US\$78.5 million equivalent and a GoM contribution of US\$3 million. Table 1 provides a summary of the project costs and financing by component.

**Table 1 –Project Costs and Financing**

Components	Estimated Cost (US\$ Million)	Financing (US\$ million)	
		IDA Credit	GoM
1 Scaling up Landscape Restoration	53	53	
2 Improving Watershed Services	82	79	3
3 Technical and Project Management Support	25	25	
Total	160	157	3

25. **SoP-2 (2023-2028) would invest in landscape restoration and watershed management in Linthipe, Bua, and Dwangwa River Basins in the central region.** These basins are critical in terms of ensuring adequate water supply for domestic and industrial uses in Lilongwe and other fast-growing towns and rural growth centers in the central region, as well as to support the development of agriculture and improved crop yields. The central region of Malawi - the fastest-growing part of the country (home to about 7.5 million people, representing 43 percent of the country's total population) – is currently facing severe water shortages that undermine the region's potential as a catalyst for economic growth. Most of the urban areas in the region (including the capital city, Lilongwe) are currently water-stressed, with water shortages reaching crisis levels. The water resources and associated water resources infrastructure in the basins, however, are threatened by the rapid increase in deforestation, particularly in the Dzalanyama Forest area upstream of the existing Kamuzu I and II dams and the proposed Diamphwe multipurpose dam. There are also significant water quality concerns due to increasing population pressures and a lack of proper sanitation as well as inadequate monitoring of industrial developments. Other parts of the catchment such as Dedza and Salima towns, face issues of limited water availability and increased flooding risks. The need to support both social and economic development in these watersheds, while at the same time ensuring the sustainability of the natural resource and associated ecosystems, therefore requires urgent attention.

26. **SoP-3 (2026-2030) would target North Rukuru and Lufilya River Basins in the northern region.** These watersheds are also crucial because of the current and future mining activities in the area, the potential for the development of agriculture particularly along the shores of Lake Malawi, and the relatively undeveloped nature of the water resources of the catchment and the potential for hydropower. As with all watersheds in Malawi, however, there are concerns in terms of increasing rates of deforestation and land degradation leading to sedimentation, reduced water quality, and an increase in flooding risk. The critical need to support both social and economic development in the catchment, while at the same time ensuring the sustainability of the natural resource and associated ecosystems requires urgent attention.

27. **Some preparatory work is already underway to ensure the entire SoP is ready for implementation and can effectively contribute to achieving the NFLRS objectives by 2030.** MoLWD has prepared catchment management strategies for Linthipe, North Rukuru, and Lufilya. Preparation of catchment management plans and sub-catchment management plans is currently underway. Additional preparatory activities, including feasibility studies and engineering designs for enabling water infrastructure identified in the catchment management strategies and plans, will be financed under SoP-1.



## A. Project Development Objective

28. The project development objective (PDO) is **to increase the adoption of sustainable landscape management practices and improve watershed services in targeted watersheds**. Achievement of the PDO will be measured using the following indicators:

- Proportion (%) of target farmers adopting sustainable landscape management practice;
- Land area (ha) under sustainable landscape management practices;
- Land area (ha) showing an increase in Normalized Difference Vegetation Index (NDVI) and the Land Surface Water Index (LSWI), correcting for short-term climate effects<sup>27</sup>;
- Number of people gaining access to water for productive use; and
- Proportion (%) of target farmers benefiting from an increase in products sold to the markets or an increase in income from marketed products<sup>28</sup>.

29. For purposes of this project, **sustainable landscape management (SLM) practices** refer to a combination of at least two technologies or practices (agronomic, vegetative, structural, and management measures) applied to improve land quality and prevent degradation or restore already degraded landscape. **Adoption** refers to a change of practice or change in the use of technologies or practices promoted or introduced by the project. For purposes of this project, a farmer will be counted as an adopter if he/she practices at least two technologies or practices on agricultural land for at least three consecutive farming seasons or any other technology on other land-use types. The National Catchment Management Guidelines and Manual contain the suite of technologies and practices appropriate to the Malawian context. These include physical soil and water conservation techniques (e.g., marker and contour ridges, ridge alignment, box ridges, water harvesting, infiltration ditches, gully plugs, check dams, etc); vegetative river/stream-bank restoration; agricultural technologies (i.e. agroforestry and farmer-managed natural regeneration), community forestry and woodlots and plantation forestry. By increasing the adoption of these SLM practices, this project directly contributes to building the capacity of both the farming community and the ecosystems in the landscape to absorb and adapt to the negative impacts of climate change. For instance, increased vegetation cover and riverbank protection helps to mitigate the impacts of flooding, and soil and water conservation techniques reduce soil loss and increase soil moisture content that helps mitigate the impacts of droughts.

30. **Watershed services** refer to the benefits people obtain from ecosystems in a watershed<sup>29</sup>. Benefits can be direct, such as provisioning services (i.e., food, water, forest products, etc.) or regulating services (i.e., control of floods, erosion regulation and water purification); or indirect, through supporting services for the functioning of ecosystem processes (i.e., nutrient cycling; soil creation; and photosynthesis). Ecosystems also provide people with non-material benefits such as aesthetic pleasure, recreational opportunities, and spiritual and cultural sustenance. The project's result framework focuses primarily on provisioning and regulating services, as the other

<sup>27</sup> Both NDVI and LWSI are measures of increased vegetation cover and soil water content. NDVI uses the visible and near-infrared bands of the electromagnetic spectrum to analyze remote sensing measurements (based on satellite imagery data) to determine the extent to which a target contains live green vegetation. LSWI uses the shortwave infrared and near-infrared bands of the electromagnetic spectrum to analyze remote sensing measurements (based on satellite imagery data) to determine the amount of water in vegetation and soil.

<sup>28</sup> Products here refers to any of the following: crops, livestock, horticulture, aquaculture and forest-based products

<sup>29</sup> A watershed is the area of land that feeds water to a river, through the process of precipitation draining through the landscape, into tributaries and into the main river channel. Watersheds are also called 'catchments', or 'river basins'. These three terms are used interchangeably in the PAD. However, to differentiate in terms of scale, we use 'river basin' to describe a watershed covering a large area of land that drains into a major river (e.g. Shire River Basin), while 'sub-catchments' or 'micro-catchments or micro-watershed' are much smaller parts of a basin that drain into a tributary stream.



services are difficult to measure and quantify. That said, the project's interventions will improve all watershed services and help to build the resilience of both people and ecosystems to climate change-induced impacts.

## B. Project Components

31. The project scope consists of three components that contribute to the PDO. Below is a brief description of the activities. Annex 1 provides a more detailed description of the project scope.

### Component 1 – Scaling up Landscape Restoration (US\$53 million equivalent)

32. This component aims to scale up landscape restoration interventions in the middle and upper Shire River Basin while enhancing the livelihoods of smallholder farming communities, addressing climate change vulnerabilities (floods and droughts), and improving or preserving the carbon sequestration capacity of the watershed. Specifically, the component will finance (i) **performance-based grants** for restoration of approximately 95,000 ha of degraded landscapes in the middle and upper Shire; (ii) **matching grants** for 200 farmer groups and 60 agri-enterprises to enhance agricultural-based livelihoods and boost household incomes; (iii) **advisory services and capacity building** on SLM practices, including climate-smart agriculture practices and silvicultural techniques, targeting approximately 15,000 people and comprising of farmers, agri-entrepreneurs, private tree growers and associations of smallholder tree growers, catchment management committees (CMCs), village natural resource management committees (VNRCMs) and district extension workers; (iv) a **social marketing campaign** to influence farmer behavior concerning adoption of SLM practices; (v) support to undertake **local-level participatory land-use planning, land demarcation, adjudication and registration** of 20,000 ha of land in the target area to provide security of tenure for approximately 16,000 small-holder farmers.

### Component 2 – Improving Watershed Services (US\$82 million equivalent)

33. This component aims to maximize the benefits people and communities obtain from managing watersheds sustainably, as a basis for developing institutional and financing mechanisms needed to sustain restoration activities beyond the project period. The project will invest in improving watershed services, focusing primarily on provisioning services and regulating services, and to some extent, cultural, recreation and amenity services, given that the Shire River Basin is home to some of Malawi's most iconic national parks and wildlife. More specifically, the component will finance (i) **performance-based grants to selected watershed management institutions** –i.e., NWRA, Department of Forestry (DoF), and Department National Parks and Wildlife (DNPW) – to implement their institutional development plans aimed at improving watershed services and building adaptive capacity to climate change; (ii) technical assistance and the initial capital required to establish a **pilot market-based mechanism for the provision and maintenance of selected watershed services**; and (iii) a package of **enabling infrastructure and climate information services** to maximize the livelihood benefits from improved watersheds, and to enhance climate-resilience of both the farming community and the ecosystems in the watershed.

34. **Enabling infrastructure investments** will include (a) development of 38 multipurpose water source infrastructure (i.e., 10 small dams, 20 rainwater harvesting structures, and eight high yielding boreholes, etc) and associated conveyance infrastructure to increase access to water for multi-purpose use for approximately 42,000 people; and (b) last-mile infrastructure to support small-holder producer groups to improve productivity, add value to their produce and gain access to markets, including construction of 10 small-medium scale irrigation systems to provide irrigation services on approximately 2,400 ha of cropland and benefiting about 5,000 farmers;



construction of rural feeder roads, bridges and market centers to improve access to markets, and clean water for value addition, where required.

35. **To improve climate information services**, the component will finance technical assistance and related goods, works and services to develop and market a suite of hydrological, weather and climate products and services to enable climate-informed decision-making by different watershed users (including smallholder farmers and agri-enterprises, energy and water utilities, dam operators, insurance companies, etc), using data from the existing and improved ground-based observation network (including a new weather radar) managed by both the Department of Climate Change and Meteorological Services (DCCMS) and NWRA, and supplemented as necessary with other sources (e.g., satellite-based data). The project will also provide innovation grants to selected private sector innovators and developers to support development of hydrological and climate products or services. At least one of the products/services developed will be an agro-weather service, capable of serving at least 8,000 farmers with agro-weather information services.

### **Component 3 –Technical and Project Management Support (US\$25 million equivalent)**

36. This component aims to strengthen MolWD's capacity to implement the proposed project (and subsequent projects in the series) in partnership with other line ministries, departments, and agencies, and to monitor and evaluate its development impact. The component will finance (i) **technical assistance for preparation of future phases of the project**, including delineation of priority (hotspot) catchments in Linthipe, Bua and Dwangwa river basins; forming CMCs, preparing catchment management plans and micro-catchment plans; and carrying out feasibility studies and engineering designs for enabling infrastructure investments identified in the catchment management plans; (ii) **technical assistance and capacity building on biophysical and ecological monitoring** to track changes in the targeted landscapes as a result of project interventions; (iii) **impact evaluations** to build the evidence-base to inform future projects in the SoP; (iv) **project management support** to the multi-sectoral technical team on project management, financial management, procurement, monitoring and evaluation, and on implementation of environmental and social standards; and (v) **incremental operating costs** associated with day-to-day management of the project and for coordination with different sectoral agencies/departments at national, district and local levels.

### **C. Project Beneficiaries**

37. **The project will directly benefit approximately 350,000 people, the majority of which are small-holder farmers.** They will get access to inputs, services, and knowledge to adopt SLM practices. Interventions will also benefit key actors in selected agriculture and sustainable forest value chains, including service and input providers, buyers, processors, and aggregators who will be involved in the matching grant scheme for agricultural production. Lastly, the project will benefit national, district and community-level institutions by providing essential tools, knowledge, and strengthening their capacity to continue investing in sustainable landscape management beyond the project period.

### **D. Results Chain**

38. **The project focuses on two complementary results areas – increasing adoption of SLM practices and improving watershed services.** The project will achieve increased adoption of SLM practices through a combination of grant support, advisory services, capacity building, technical assistance, and social marketing. Similarly, improved watershed services would be realized by strengthening key watershed management



institutions; piloting a market-based mechanism to complement the institutional capacity interventions and to provide an opportunity to crowd-in private financing for watershed services where a market for such services exist; and investing in a package of enabling infrastructure and climate information services to maximize the livelihood benefits from improved watersheds, and to enhance the climate resilience of both the farming community and the watershed.

39. **Taken together, these interventions are expected to result in:** (i) approximately 70 percent of target farmers adopting SLM practices; (ii) 95,000 ha of land area restored and under SLM practices, of which about 50 percent of this land is expected to show an increase in vegetation cover and soil moisture content (as measured by NDVI and LSWI); (iii) approximately 42,000 people gaining access to water for productive use, and about 50 percent of target farmers benefiting from an increase in products sold to the markets or an increase in income from marketed products. **Figure 2** below further illustrates the project's theory of change.

#### E. Rationale for World Bank Involvement and Role of Partners

40. **The World Bank brings significant value-added to the project, based on the wealth of experience and expertise developed through support for SRBMP, as well as other similar operations in the region and beyond.** Participation of the World Bank is key to the success of GoM's NFLRS and this project. The World Bank has been a long-standing and valued partner in Malawi's water, agriculture, environment sectors for more than 20 years, supporting vital investments in critical water infrastructure, agriculture and development, natural resources management, and disaster risk management. The proposed project will build upon and leverage the Bank's deep familiarity and broader involvement in these sectors.

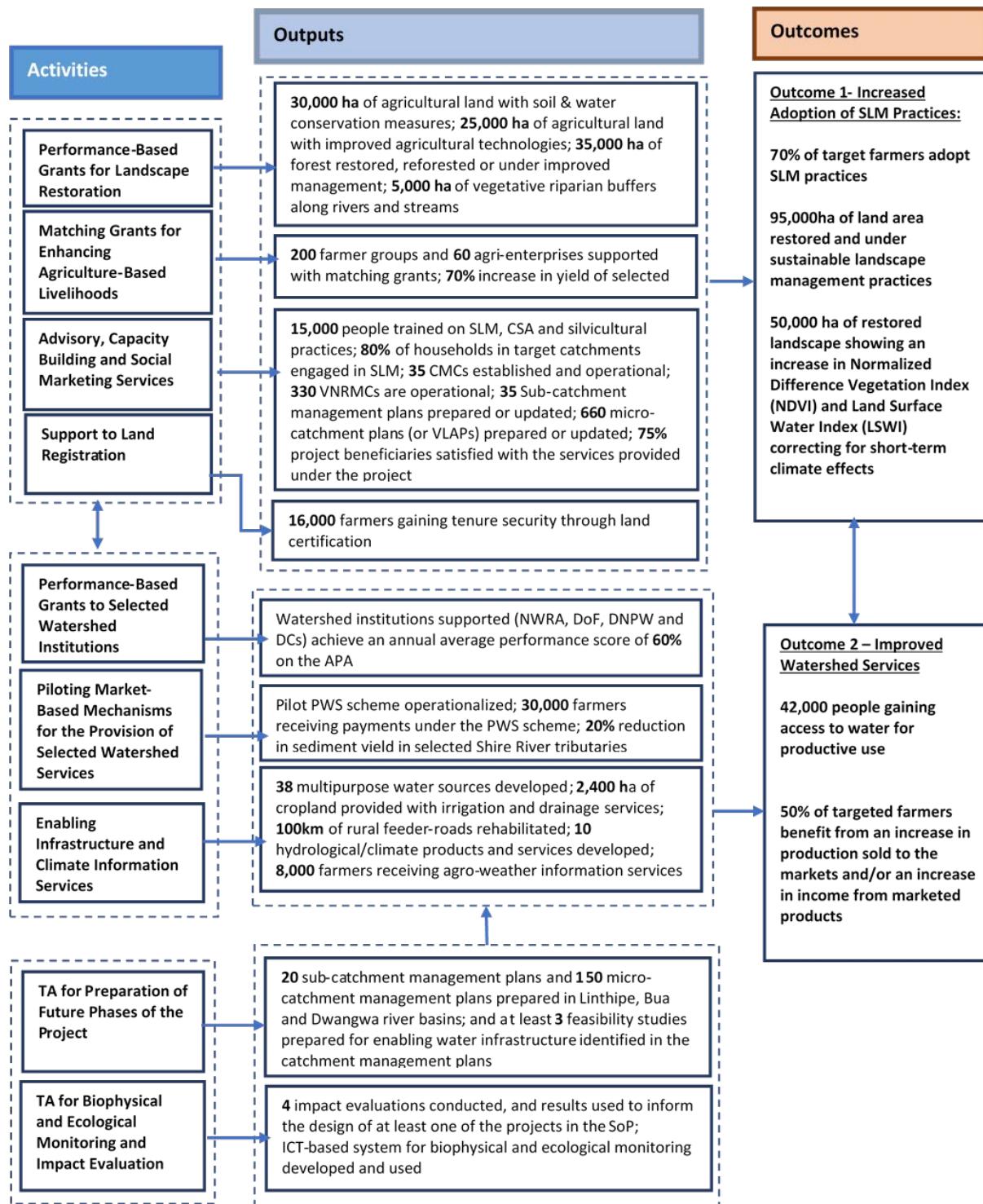
41. Through this project, the World Bank will play a catalytic role in the roll-out of the NFLRS by providing concessional finance to scale-up landscape restoration efforts in the Shire River Basin, while at the same time strengthening institutional capacities at the national and local levels to enable expansion of interventions to other priority river basins. Participation of the World Bank will most likely catalyze additional financial commitments from other development partners to support the NFLRS. Several local and international Non-Governmental Organizations (NGOs) are supporting SLM interventions in Malawi, and there is a strong commitment across agencies to improve coherence and complementarity of support, with the World Bank taking a lead role. This packaging of financial, knowledge and convening services is at the heart of the World Bank's value proposition in this project.

42. **The project will also complement and support other resilience-enhancing operations supported by the World Bank as follows:** (i) Mpatamanga Hydropower Project (P165704, planned) – MWASIP will contribute to provision of vital ecosystem services upstream of the plant to mitigate operational risks associated with high levels of sedimentation; (ii) Shire Valley Transformation Project – Phase 1 (P158805, ongoing) – MWASIP will contribute to provision of vital ecosystem services to protect water resources for the irrigation scheme and reduce sediments in the irrigation canals; (iii) Malawi Flood Emergency Recovery Project (P154803, ongoing) – MWASIP will complement flood resilience interventions under this project by investing in the development of hydrological, weather and climate products and services; (iv) Malawi Drought Recovery and Resilience Project (P161392, ongoing) and Malawi Resilience and Disaster Risk Management Project Additional Financing (P171877, ongoing) – MWASIP will complement drought and flood resilience interventions under this project by investing in SLM, multipurpose water source development, and climate information services; (v) Malawi Social Support for Resilient Livelihoods Project (P169198, ongoing) – MWASIP will complement the livelihoods investments and enhanced public works (including catchment protection) activities under this project; and (vi) Agricultural Commercialization Project (P158434, ongoing) and Agricultural Sector Wide Approach Support Project (P164445,



ongoing) – MWASIP will complement agricultural productivity and market access investments under these two projects.

Figure 2: Theory of Change





43. **There is a strong rationale for public financing of the project, given the public goods nature of the environmental benefits derived from the project.** With the externalities associated with landscape degradation and natural disasters, large-scale private financing of landscape restoration is uncommon. Moreover, recent research<sup>30</sup> suggests public funding to increase SLM adoption may be justified to create peer effects, which may in the long term, reduce the need for public finance as further adoption becomes self-reinforcing. Nonetheless, consistent with the Maximizing Finance for Development (MFD) principles of the World Bank, the project design (through the matching grant scheme) provides opportunities for private sector investment in agricultural and forest value chains. The project will also finance technical assistance to explore possibilities for payment for watershed services (PWS) from private and public-sector organizations, where the concentration of benefits derived by such entities makes this feasible. Recent studies suggest that a PWS scheme focused on sediment reduction in the Shire River may be viable, given the high costs incurred by the Electricity Generation Company (EGENCO) in sediment management. However, there is a need to conduct PWS trials to understand the most appropriate level and structure of payments and to develop and test the monitoring and verification tools. The project will finance these trials (including payments to farmers) to provide a demonstration to potential buyers of watershed services.

#### F. Lessons Learned and Reflected in the Project Design

44. **The project design draws on lessons from SRBMP – the first integrated river basin management project in Malawi.** SRBMP demonstrated a scalable, community-based approach to addressing the alarming levels of landscape degradation and showed that it is possible to achieve results within a typical project lifetime. Some of the lessons learned from SRBMP and reflected in the project design include (i) use of a community-led landscape approach to achieve results at scale; (ii) use of small community grants to provide financial incentives for SLM adoption; (iii) integrating climate-smart agriculture (CSA), agroforestry systems and supporting agriculture value chains to enhance livelihoods; and (iv) the need for sustained focus on building watershed institutions, with emphasis on strengthening existing financing mechanisms to increase the level of financing available for watershed management and related services.

45. **The project design also draws on lessons from other landscape restoration and watershed management projects financed by the World Bank and others in Africa.** For instance, in Rwanda, the Land Husbandry, Water Harvesting and Hillside Irrigation Project demonstrated the value of combining support for SLM with CSA and the development of market linkages. Landscape restoration projects in Burundi and Ethiopia have demonstrated the critical importance of secure land tenure to SLM adoption.

### III. IMPLEMENTATION ARRANGEMENTS

#### A. Institutional and Implementation Arrangements

46. **The project will adopt the same implementation arrangements used for SRBMP.** MoIWD is the lead implementing ministry for the project. However, individual project components, sub-components, and activities will be implemented through relevant departments, other ministries, and local governments, as appropriate. MoIWD will sign a memorandum of understanding with each participating ministry or department or agency.

<sup>30</sup> Bell, A.R et al (2018). Transformative change through Payments for Ecosystem Services ( PES ): a conceptual framework and application to conservation agriculture in Malawi. Glob. Sustain. 1, 1–8. doi:10.1017/sus.2018.4



The existing multi-sectoral Technical Team (TT) comprising staff from various ministries and departments, will be retained and strengthened to provide coordination support for the project. The TT will function as the Program Management Unit (PMU). A Program Coordinator, seconded from MoIWD, will lead the PMU/TT.

47. Further, MoIWD will engage a Project Management Support (PMS) team to support the TT on project management, financial management, procurement, monitoring and evaluation, and environmental and social standards implementation. The existing Project Steering Committee (PSC) and the Project Technical Committee (PTC) will also be retained to provide overall policy and technical guidance, respectively. District local governments will continue to play a critical role in delivering SLM/CSA extension services to farming communities in the target watersheds. CMCs will be formed in line with the Water Resources Act 2013 to spearhead the implementation of landscape restoration activities, working with existing VNRCMs at the micro-catchment level. Annex 2 provides further details on project implementation arrangements.

## B. Results Monitoring and Evaluation Arrangements

48. **The project will rely on the existing M&E system developed under SRBMP to monitor results, as well as inputs and processes.** The project results framework (see section VII) will form the basis for tracking progress on project outputs and outcomes. Process monitoring will focus on management processes that are critical to achieving the project's objectives, such as procurement, financial management, environmental and social, capacity building, and institutional strengthening activities. All teams involved in the implementation of the project will participate in the process of data collection, compilation, analysis and use. The project will adopt a multi-layered approach to monitoring and verification of results at the field level, using a combination of field visits, mobile-based reporting with geo-tagged photos, unmanned aerial vehicle (UAV) surveys, remote sensing, and satellite imagery. A small unit headed by an M&E specialist will be formed within the TT to coordinate all project M&E activities. Reporting on project progress will be undertaken on a semi-annual basis to build a learning platform to inform project management and to improve project performance. Reports will cover implementation status and results, challenges, and proposed actions to address them, the status of procurement and disbursements, and the status of environmental and social standards implementation. The M&E unit will also conduct annual beneficiary surveys as part of project monitoring. The project will fund necessary equipment (e.g., computers, software, and other goods), capacity building, and incremental costs to strengthen results and process monitoring at the project level and to equip the TT to carry out these responsibilities. To the extent possible, project monitoring data will be made publicly available.

49. **Beyond results monitoring, the project M&E design also includes biophysical and ecological monitoring to track changes in the targeted watersheds as a result of project interventions.** A framework for biophysical and ecological monitoring will be developed, together with associated ICT tools and geo-spatial information systems. The project will also support (i) collection of spatially-referenced baseline biophysical data such as soil erosion maps, sediment yields, soil fertility maps, etc; (ii) ecological zoning of agroforestry systems; (iii) preparation or update of agro-ecological zones; (iv) preparation of national forest cover maps, land use and land cover maps; and (v) capacity building of districts, relevant ministries, departments and agencies on biophysical and ecological monitoring.

50. **Finally, to build the evidence base for SLM decision-making, four impact evaluations (IE) are planned to be conducted through a partnership between MoIWD and the Lilongwe University of Agriculture and Natural Resources (LUANAR).** The first (IE1) will be an IE using randomized control trials to evaluate the effectiveness and impact of financial incentives on farmer decisions to adopt SLM practices. The second evaluation (IE2) will be a biophysical impact evaluation examining the response of the environment to SLM interventions, considering



parameters such as peak and base surface water flows, groundwater levels and recharge rates, sediment loads, and remotely sensed information on vegetation cover and soil moisture. The third evaluation (IE3) will investigate the productivity gains from adopting SLM and CSA. Lastly, a livelihood impact evaluation (IE4) will examine the impact of project interventions on livelihoods (household incomes) in the targeted watersheds.

### C. Sustainability

51. **GoM is committed to the project and sustainability of project outcomes.** The project contributes directly to the MGDS III priority areas of agriculture, water development, and climate change management by supporting investments that address land degradation and its impacts on water resources, agricultural productivity and rural resilience. However, given the historically low public funding levels for natural resources management in Malawi, the project has been designed to reduce dependence on the national budget for sustainability.

52. **The project design includes several features to enhance sustainability.** First, the project design provides for interventions to improve the financial performance of crucial watershed management institutions – i.e., NWRA, DoF, and DNPW – to increase their revenues from watershed services. Second, the project uses an integrated landscape management approach that emphasizes livelihood improvement and careful consideration of trade-offs from different land uses through an inclusive and participatory planning process. Third, the project design includes several mechanisms to prepare target watersheds to graduate from project-based assistance and continue managing restored landscapes. First, the project will support the formation and training Catchment Management Committees (CMCs), which will maintain the catchment protection activities in line with their mandate as per the Water Resources Act 2013 and supported by NWRA's improved revenue stream. Second, the project design includes support for securing land tenure, as well as value chain linkages for enhanced returns from sustainable, productive activities. Together, these interventions will strengthen long-term incentives for investment in sustainable land and water management. Finally, the project includes technical assistance to explore potential PWS schemes in the Shire River Basin linked to hydropower generation.

## IV. PROJECT APPRAISAL SUMMARY

### A. Economic and Financial Analysis

53. **A cost-benefit model has been used to assess the ex-ante efficiency of the project.** Annual cost and benefit flows are estimated as the difference between 'without project' and 'with project' net benefits for direct beneficiaries. Under the 'without project' scenario, land degradation will continue its current path causing direct losses to those that rely on land, forests and woodlands for their livelihood. Production yields will go down or farmers will have to increase their input costs to maintain current yields. Non-agricultural land in the watershed will also continue to deteriorate without the project due to soil erosion. Downstream from the project areas, continued land degradation will also affect areas and households through increased flood risk and sedimentation of irrigation and hydropower plants. Deterioration of raw water quality will lead to an increase in the cost of treating water for domestic use.

54. **Incremental benefits have been estimated for project Components 1 and 2.** The benefits considered include: (i) improved productivity resulting from sustainable soil and water management practices and improved agronomic practice, (ii) farm-level incremental benefits, (iii) diversified and increased farm benefits from enterprise support and enhanced access to financial services, and (iv) GHG emissions estimates generated over 26 years (project's economic life). The economic analysis considered three scenarios: (i) without the social value



of carbon—the base scenario; (ii) the social value of carbon using high shadow price of carbon; and (iii) the social value of carbon using low shadow price of carbon. Annex 3 provides the details of the analysis.

55. **The results of the economic analysis show that the project is economically justified.** The results indicate that the project is economically viable under all the scenarios assumed. The analysis suggests that the project generates significant carbon sink benefits. The inclusion of these benefits significantly increases the economic returns of the project. Sensitivity analyses indicate that the economic viability of the project is robust under most of the assumptions (see Annex 3).

**Table 2 - Results of Economic Analysis**

No	Scenarios	NPV (US\$ million)	IRR (%)	B/C Ratio
<b>1</b>	Without the social value of Carbon	85.97	15.76%	1.87
<b>2</b>	With the social value of Carbon-high shadow price of Carbon	304.6	31%	
<b>3</b>	With the social value of Carbon- low shadow price of Carbon	205.4	24%	

56. **Further, the World Bank carried out a financial analysis to determine whether the project is financially attractive to smallholder farmers.** The financial viability of the main crop and farm models to be supported by the project were assessed to determine their profitability and effects on the beneficiary's income. Financial crop models were based on the prevailing farming system in the Middle Shire and information available from similar projects and programs supported by the GoM and other development partners. The models compare the 'without project' and 'with project' scenarios. Under the 'without project' scenario, farmers would continue with low-input, low-output, largely rain-fed production systems, which are increasingly being threatened by loss of soil fertility and soil erosion. Available information from ongoing interventions supporting improved land management in Malawi suggests that there is scope for significant increases in productivity, through conservation agriculture, improved soil and water conservation, agroforestry, and small-scale irrigation, reflected in the 'with the project' scenario. For financial analysis, family labor is valued at 800 Malawian Kwacha (MK) per person-day. Given land scarcity in the Middle Shire in particular, this analysis does not assume any increase in the cropped area nor changes in crop pattern distribution.

57. Several enterprise models were included in the analysis, including the processing of oil crops, honey production and a range of small-stock enterprises. These enterprises are all assumed to be in the 'with project' scenario, as these constitute some of the activities to be promoted by the project under the matching grant scheme. Since the matching grant scheme will be demand-driven, it is difficult to estimate how many groups will engage in each type of enterprise. Table 3 presents a summary of the results under different assumptions. At the farm level, the annual incremental benefit varies according to which crops are grown. The average net margins per ha and return to labor appear much higher for horticulture than rice and maize.

**Table 3- Summary of Financial Returns on Crop Production**

	Without project			With project		
	Maize	Horticulture	Rice	Maize	Horticulture	Rice
Area per HH (ha)	0.66	0.1	0.25	0.66	0.1	0.25
Income (MK/ha/year)	20,902	470,788	115,119	52,434	697,245	343,667
Return to labor (MK/person-day)	1,163	6,402	1,655	1,786	6,650	23,260
Income per HH (MK/year)	13,796	47,079	28,779	34,606	67,723	85,917

58. This table also presents the financial results of the combined cropping patterns in the with-project situation. For maize, the net margin per household, for the same cultivated area as in the without-program scenario, would increase from 13,796 MK without a project to 34,606 MK with the project. For horticulture, under



the same conditions, the increase is from 47,079 MK up to 67,723 MK per household, and year. For rice, it goes from 28,779 MK to 85,917 MK. Overall income weighted average would increase from 27,976 MK/year/household to 54,352 MK/year/household, while value of production of targeted households would rise from 1,671 to 3,269 million MK.

59. Tale 4 shows the results of the gross margin analysis for selected livelihood diversification activities. The results indicate that these activities can potentially boost the income of target farming households.

**Table 4.** Gross Margin Analysis for Selected Livelihood Diversification Activities

Type	Unit	Livelihood activities					
		Oil Press	Goat	Layers-egg	Broiler	Honey	
Investment	MK/year	5,673,831	595,479	707,820	1,126,617	3,179,216	2,256,592
Recurrent costs	MK/year	4,109,441	249,222	436,239	117,975	1,666,940	1,315,963
Benefits	MK/year	5,451,226	599,475	1,431,606	1,019,108	5,994,750	2,899,233
Gross margin	MK/year	<b>1,341,785</b>	<b>350,253</b>	<b>995,367</b>	<b>901,133</b>	<b>4,327,810</b>	<b>1,583,270</b>

## B. Technical

60. **The technical design of the project draws on multiple studies and analytical work, and the experience and lessons learned from SRBMP.** The project design draws on the National Forest Landscape Restoration Assessment (NFLRA) – which, by far, provides the best science and knowledge on landscape restoration at the national scale in Malawi. The design follows a comprehensive landscape restoration strategy, using the micro-watershed as the planning and implementation unit. The proposed SLM technologies have been tested and proved successful in the Malawian context and are codified in the National Catchment Management Guidelines and Manual. The project will continue to support restoration work in the four catchments targeted under SRBMP. These catchments were identified through a modeling exercise as highly degraded and as significant contributors of sediments in the Shire River. Further, recent geospatial modelling has identified Balaka, Machinga and Mangochi as potential target districts with high restoration potential.

61. **Infrastructure investments will follow a framework approach** because the exact scope of the investments cannot be finalized before project appraisal as it requires participatory planning and prioritization with the communities in the target catchment areas. MoIWD has prepared the framework to guide the selection and appraisal of enabling infrastructure investments to be financed under sub-component 2.3 (see Annex 4 for details). The purpose of the infrastructure investments is to maximize the livelihood benefits from improved watersheds and to enhance the resilience of both the farming community and the watershed. The framework provides a criterion for selection and prioritization of infrastructure investments according to PDO relevance, readiness, environmental and social constraints and risks, implementation capacity, cost, and water availability. The World Bank has reviewed the framework and found it satisfactory for the purposes of the project.

## C. Fiduciary

62. **Financial management (FM) arrangements are satisfactory for the project.** However, the risk is substantial. The assessment identified weaknesses in the FM systems of the districts and the departments/agencies that will receive performance-grants (i.e., NWRA, DoF, and DNPW). The main challenges are weak internal audit function, poor management of bank accounts, delayed financial reports, use of excel spreadsheets for transaction processing and reporting, and inadequate FM staff. The weak public finance management control environment, characterized by poor managerial accountability and absence of consistent



application of disciplinary measures, exacerbate these challenges. Other deficiencies noted during SRBMP implementation was poor planning and budgeting, leading to cost overruns and delays in implementation.

63. **MolWD has agreed to implement the following actions to mitigate the above risks.** First, all districts receiving performance grants under the project will be required to process and report on project operations using the Integrated Financial Management Information System (IFMS), which is already available in the districts. Similarly, NWRA, DoF, and DNPW will be required to shift from excel-based accounting to using IFMIS or other computerized accounting software for transaction processing and reporting. Secondly, districts will be required to open exclusive bank accounts for the project, while DoF, DNPW, and NWRA will use their existing fund accounts. Bank reconciliations will be regularly monitored by the project FM staff in the TT. Third, the internal audit function will be enhanced by using making use of the team from the Central Internal Audit Unit. A robust internal audit function will ensure the timely detection of errors and other irregularities. Fourth, the project FM staff will closely work with district, departments, and agencies to ensure compliance with agreed policies and procedures, including timely reporting. Where necessary, the TT will recruit accounts assistants to assist both the districts and communities in financial management and reporting. Finally, the World Bank and government team will ensure that the project uses activity-based planning and budgeting with realistic assumptions.

64. **Procurement.** Procurement activities under the proposed project will be carried out following (a) World Bank's *Procurement Regulations for IPF Borrowers (Procurement in IPF – Goods, Works, Non-Consulting and Consulting Services; July 2016, revised November 2017 and August 2018)*; (b) World Bank's *Guidelines on Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated July 1, 2016, and*; (c) other provisions stipulated in the Financing Agreement (FA).

65. MolWD has prepared a Project Procurement Strategy for Development (PPSD) identifying optimum procurement strategies for meeting the development objectives of the project (see Annex 2 for details). The PPSD is a living document that should be regularly updated during project implementation to provide necessary justifications for procurement arrangements, procurement plans, and their updates. Based on the PPSD, MolWD has prepared a procurement plan (PP) for the first 18 months. The procurement plan will be updated at least every 12 months, or as required, to reflect the actual project implementation needs. Each update shall require World Bank approval and will be publicly disclosed. The project will use the World Bank's Systematic Tracking of Exchanges in Procurement (STEP) as a primary tool to submit, review, and clear all procurement plans and conduct all procurement transactions for the project.

66. **Procurement Implementation Arrangements.** MolWD will have the responsibility for procurement implementation, contract management, and the related decision-making authority under the project. The World Bank carried out a Procurement Capacity and Risk Assessment of the MolWD and rated the procurement risk as Substantial. The assessment identified significant risks that would adversely affect project implementation if not mitigated. Annex 2 provides details of procurement risks, and the corresponding mitigation measures/actions.

#### D. Legal Operational Policies

	Triggered?
Projects on International Waterways OP 7.50	Yes
Projects in Disputed Areas OP 7.60	No



## E. Environmental and Social

67. **The project responds to Malawi's most pressing environmental challenge – the degradation of the renewable natural resources base (mainly land, water resources, forests, and associated ecosystem services) that underpins the productive sectors of the economy.** The project's central thesis is that degradation of the natural resources base and high exposure and vulnerability to climate change have adversely affected water security, energy generation, agricultural productivity, and livelihoods. Crucially, the project recognizes the long-term nature of restoration efforts, and the need to maximize benefits people and communities obtain from managing watersheds sustainably as the foundation for breaking the cycle of degradation.

68. **The World Bank has carried out a due-diligence assessment of the project's potential environmental and social (E&S) risks and impacts.** Overall, the project will have positive E&S impacts by improving agricultural land management, increasing forest cover, reducing erosion and sedimentation in the upper and middle parts of the Shire River Basin, while enhancing the livelihoods of small-holder farming communities. The project will also improve watershed services, including enabling water infrastructure and climate information services to maximize the benefits that people, and communities obtain from managing watersheds sustainably. While the sub-project interventions may have associated adverse effects, these will be minor, localized, and temporary, and therefore manageable. The project activities with anticipated E&S impacts are those involving construction and rehabilitation of enabling infrastructure in the targeted watersheds (Sub-component 2.3). These will include multipurpose water source infrastructure (i.e., small dams, water harvesting structures, high yielding boreholes) and associated conveyance infrastructure; small to medium irrigation schemes; and rural feeder roads, bridges and market centers to improve access to markets. These interventions are well known and have a good track record of implementation across a diverse range of locations and situations in Malawi. The potential risks, likely impacts and mitigation are, therefore, already well understood by practitioners.

69. The project worksites will have the potential for generating construction-related health and safety concerns for both laborers/workers and surrounding communities. There is also a risk of potential labor influx from outside of the project area exacerbating the risks associated with disease transmission and the spread of HIV, the potential for Gender-Based Violence (GBV), and Sexual Exploitation and Abuse (SEA). An initial screening rates the labor influx profile of the project as medium impact and, based on that screening and other factors, the project has been assessed to have a moderate risk of GBV/SEA due to the prevalence of drivers such as high levels of poverty, rural context of the project, the reported rates of SEA and social acceptance of at least one reason for spousal abuse, and high levels of child marriage. The project will apply specific measures to avoid, minimize, and mitigate the risks related to GBV and SEA, such as including assessment of GBV risks in the environmental and social impact assessments (ESIAs); providing specific mitigation measures in the environmental and social management plan (ESMP) and contractor ESMPs; clear definition of GBV requirements and expectations in contractor bid documents, including contractual sanctions and the use of a code of conduct which addresses GBV; and putting in place an effective Grievance Redress Mechanism (GRM) with multiple channels to initiate complaints.

70. Successful implementation of landscape restoration activities, matching grant schemes for agriculture livelihoods, and associated enabling infrastructure (water sources, irrigation systems, feeder roads etc, markets etc) will potentially lead to gains in productivity and provide beneficiaries with significantly enhanced livelihood opportunities. Further, people who currently experience extreme vulnerability in terms of land rights will obtain secure tenure through the land registration activities supported under sub-component 1.4. However, while the benefits of these interventions are potentially enormous, there are also significant associated risks that they could be diverted and captured by elites. For instance, in the case of land registration, people better



able to understand formal legal processes or with greater connections to political or economic capital may seek to manipulate the land adjudication process and successfully lay claim to more than their share. Less sophisticated participants may be induced by local elites or outside speculators into ill-informed informal sales in advance of the land adjudication process, and customary norms governing land rights may put vulnerable women at a disadvantage during the land registration process. The project includes specific measures to mitigate these risks. First, the demand for land certification is likely to exceed the available financial support, and for this reason, priority will be given to farmers receiving matching grants. Second, the project will give attention to securing land tenure for women, and a specific indicator has been included in the project results framework to focus attention on this issue. Third, the project will finance operating costs to set up customary land committees and tribunals, training them to undertake their duties in accordance with the law, providing necessary equipment and materials to support the process. Finally, the project will follow a community-based approach to landscape restoration to minimize the risk of elite capture, working through community-based structures such as CMCs, WUAs and VNRCMs.

71. Further, as the project is in remote rural locations of Malawi with high indices of poverty, there are risks in terms of permanent or temporary loss of land, access restrictions to natural resources, and disruption to livelihoods. Project activities (especially DoF and DNPW activities under Sub-component 2.1) may trigger involuntary restriction of access to natural resources in legally designated national parks and forest reserves. However, both DoF and DNPW have a track record of working with communities on managing forests and protected areas and have well-tested participatory approaches to minimize livelihood impacts, as outlined in the Process Framework (PF).

72. **As the specific sub-project locations are not yet defined and identified, MoIWD has prepared several framework documents –i.e., Environmental and Social Management Framework (ESMF), Resettlement Policy Framework (RPF) and Process Framework (PF)–to guide the preparation of appropriate E&S risk management instruments during project implementation.** Depending on the subproject type and the E&S context, MoIWD will prepare subproject specific ESIsAs, ESMPs, and Resettlement Action Plans (RAPs) when the subproject locations become known. In addition, all technical assistance activities, including technical assistance for preparation of future phases of the project (sub-component 3.1) will be assessed for potential risks and impacts with due regard to the mitigation hierarchy. The ToRs, work plans or other documents defining the scope and outputs of technical assistance activities shall comply with the environmental and social standards relevant to this project. MoIWD has also developed Labour Management Procedures (LMP) to promote sound worker-management relationships, fair treatment of all project workers, promotion of safe and healthy working conditions for project workers, and to ensure compliance with the World Bank Group's Environment, Health, and Safety Guidelines. MoIWD has also conducted consultations on the ESMF, RPF, PF, and LMP, and appropriate grievance-handling procedures are in place. All the framework documents were publicly disclosed in-country and on the World Bank's website on February 12, 2020.

73. Further, an Environmental and Social Commitment Plan (ESCP) has been agreed with MoIWD and disclosed on February 12, 2020, setting out the substantive measures and actions (including timeframes) the Borrower will take to meet E&S requirements throughout project implementation. Progress on the ESCP shall be reviewed regularly by both the World Bank and MoIWD as part of project monitoring and reporting. To ensure adequate E&S risk management during implementation, MoIWD has agreed to recruit experienced E&S specialists as part of the PMS unit to provide support in implementing the E&S standards. Also, the project will support capacity strengthening at the district level on E&S risk management.



**74. GHG accounting and climate co-benefits. The project will deliver significant climate change mitigation co-benefits.** The project's economic analysis incorporates the estimates of the GHG emissions generated over the project's economic lifetime (26 years). The GHG accounting calculation accounted for the emissions associated with the landscape restoration activities on approximately 95,000 ha of land in the upper and middle Shire River Basin, using various SLM technologies (i.e., soil and water conservation, vegetative riparian buffers, agricultural techniques, community forestry and wood lots, plantation forestry management). The estimated net GHG emission attributed to landscape restoration activities under Component 1 of the project is -4,591,402 tons of CO<sub>2</sub>e over 26 years, with net annual average emissions of -176,592 tons of CO<sub>2</sub>e. On a per hectare basis, the support for landscape restoration activities will result in estimated net emissions of -48 tons CO<sub>2</sub>e/ha and -1.9 tons CO<sub>2</sub>e/ha/year.

**75. The project will also deliver significant climate change adaptation co-benefits through both Components 1 and 2.** Component 1 directly contributes to building the adaptive and absorptive capacity of both the farming community and the ecosystems in the Shire River Basin, making them more resilient to droughts (by conserving water; harvesting water; adopting smart agriculture, etc.) and floods (by protecting forests and conserving soil and restoring streambanks, among others, thereby reducing the increasing flood risk and its impact). Under Component 1, the project will promote the adoption of SLM practices and support communities to implement various landscape restoration interventions on approximately 95,000 ha of land. These interventions would result in increased vegetation cover and reduced soil erosion. Increased vegetation cover and riverbank protection will help to mitigate the impacts of flooding, while soil and water conservation on agricultural land will reduce soil loss and increase soil moisture content that helps mitigate the impacts of droughts. Also, a combination of matching grants and agricultural advisory services financed under Component 1 will enable farmers to invest in sustainable intensification of agriculture, learn new climate-smart farming methods, increase productivity, add value and enhance market access for produce. Investment support will be provided in selected high value chains, including horticulture, livestock and livestock products to diversify income sources. Together, these activities will contribute to building the capacity of farmers to adapt to the negative impacts of climate change and to diversify agricultural systems to avoid the impacts climate change.

76. Component 2 activities will also build the climate resilience of both people and ecosystems, through (i) strengthening key institutions charged with responsibility to manage Malawi's watersheds and building their adaptive capacity; (ii) construction of multipurpose water sources (small to medium dams, rain water harvesting structures, high yielding boreholes) to diversify the water sources in each target watershed, increase water supply for multiple use and therefore mitigate against the risk of drought; (iii) construction of irrigation systems to mitigate the risk of rainfall variability on agricultural-based livelihoods; and (iv) developing a suite of hydrological, weather and climate products and services to enable climate-informed decision-making by different users (including small holder farmers).

**77. Citizen engagement.** The project will rely on a participatory approach codified in Malawi's National Guidelines for Integrated Catchment Management and Rural Development. Plans for the rehabilitation of degraded landscapes will be developed through a consultative process. A broad representation of people in the targeted watersheds who derive their livelihood from natural resources will be involved in the planning process. The project will also support behavioral research on factors influencing farmer adoption of SLM practices. The project will also support a national social marketing campaign to change farmer behavior concerning the adoption of SLM practices. Further, MoLWD has developed and published a Stakeholder Engagement Plan (SEP) outlining the general principles, strategy, and plan for stakeholder engagement throughout project implementation. Feedback mechanisms will be put in place to ensure transparency, accountability, and learning as well as a continuous dialogue with target beneficiaries and other stakeholders.



The project result framework includes an indicator relating to beneficiary satisfaction with services provided under the project. The PMU/TT will track this indicator through annual beneficiary surveys. The project will establish a project-level GRM, as outlined in the Stakeholder Engagement Plan (SEP), with multiple channels, to facilitate individuals and communities to voice/express general complaints, queries, and concerns. The proposed project GRM will take into consideration the existing and established community and local-level feedback systems as an entry point, for which the traditional and local leaders will play an essential role in receiving and directing the complaints to subsequent levels. The project will ensure that all complaints received are written and treated with transparency and confidentiality, and the GRM will also provide an opportunity to escalate issues of concern to subsequent levels such as district administrations, PMU, and the courts.

**78. Gender and social inclusion.** The project will generate positive results for women and other vulnerable groups (e.g., youth) since they are more dependent on land and natural resources for livelihoods. That said, the World Bank has carried out a gender analysis to identify potential gender-related impacts of the project, the critical gender gaps and actions MoIWD will take to close those gaps, and the relevant indicators to track progress. The analysis finds that women and disadvantaged groups bear a higher cost of land and forest resources degradation than men. Women in Malawi comprise 52 percent of the agricultural labor force, and, according to one estimate, women are responsible for performing 50-70 percent of all agricultural tasks in the country, thereby producing 70 percent of local food. Yet women farmers are consistently found to be less productive than male farmers. Low agricultural productivity has direct effects on landscape degradation. The persistently low per hectare yields lead to more intense farming—resulting in over-cultivation, soil erosion, and land degradation.

79. The productivity gap exists because women typically have less access to critical agricultural inputs such as land, labor, knowledge, fertilizer, improved seeds, and financial and agricultural extension services. Moreover, rural women in Malawi are twice as likely to suffer ‘time poverty’ as rural men, relative to the total amount of productive and unpaid work they perform, with 82 percent of women involved in unpaid care and domestic work as opposed to 18 percent of men. Among many limitations, this time poverty reduces the amount of labor available for engaging in SLM and climate-smart agriculture practices. Another significant barrier to improving agricultural productivity among women is their limited access to land. Customary norms governing land rights mean that women hold only one-third of farm holdings in Malawi. Women’s farms are often less than half the size of men’s farms and are less likely to have irrigated land. Male-dominated water user associations (WUAs) often control water for irrigation.

80. Several measures are included in the project design to help close these gaps and ensure women fully benefit from the project interventions. First, MoIWD has agreed to promote the participation of women, women-headed households and the youth and to mainstream gender and social inclusion into every sub-project as well as in the monitoring and evaluation mechanisms. In this regard, MoIWD will track project beneficiaries, grievances and client satisfaction using gender-disaggregated data to understand the benefit better flows to women, men and youth and to use the data to refine implementation processes where necessary. Second, to close the specific gender gaps identified above, MoIWD has committed to the following actions: (i) under the matching grant scheme, MoIWD will give special consideration to applications from women and youth to increase their chances of accessing inputs, labor-saving technologies, knowledge, and financial services; (ii) implement targeted training on gender-responsive SLM and climate-smart agriculture targeting both male and female farmers, as well as extension workers at district level; (iii) give special attention to securing land tenure for women and youth, where possible, under the land registration sub-component; and (iv) promote women participation and representation in decision-making in WUAs, CMCs and VNRMCs, in line with GoM’s gender policy. Two indicators have been included in the project results framework to monitor the



success of these actions. These are: (i) number of female farmers benefiting from an increase in production sold to the markets or an increase in income from marketed products; and (ii) number of female farmers gaining tenure security through land certification.

**81. The project triggers OP/BP 7.50.** The project area is in an international water basin. Most of the project activities are aimed at better watershed and land management, afforestation and reforestation, biodiversity conservation as well as CSA. These activities will contribute to reducing soil erosion and rejuvenate degraded landscapes, resulting in less siltation of rivers and streams in the targeted watersheds. None of the project activities will therefore adversely change the quality or quantity of water flows to the other riparian countries. The physical interventions to be financed by the project include small-to-medium dams, as well as small-scale and micro-scale community-level irrigation. The impacts of these investments are negligible and the cumulative abstractions minor. Nevertheless, the World Bank, on behalf of GoM, sent notification letters on October 28, 2019, to all riparian countries (Mozambique, Tanzania, Angola, Botswana, Namibia, Zambia, and Zimbabwe). The deadline for the responses was November 29, 2019. Two of the riparian countries responded to the notification. In its letter dated November 29, 2019, the Government of Zambia expressed "no objection" to the implementation of the proposed project. Similarly, the Government of Zimbabwe, in a letter dated January 7, 2020, stated its "no objection" to the proposed project. No other responses were received. The riparian notification process was completed according to the OP/BP 7.50 and approved by the Regional Vice President of the World Bank on January 31, 2020.

## V. GRIEVANCE REDRESS SERVICES

82. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit <http://www.worldbank.org/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit [www.inspectionpanel.org](http://www.inspectionpanel.org).

## VI. KEY RISKS

83. The overall risk of the project is considered **Substantial**. Below is a brief explanation of the critical risks and proposed mitigation measures.

84. **Political and governance risks are Substantial.** The project is exposed to risks related to corruption and fraud. These are substantial country risks that reach far into most aspects of the public sector in Malawi, at both national and local government levels. A fresh presidential election is expected in July 2020<sup>31</sup>, and is likely

<sup>31</sup> On February 03, 2020, the Malawi Constitutional Court annulled the presidential elections held on May 21, 2019 and ruled that a fresh Presidential election be held by July 2, 2020 (exact date pending)



to heighten politicized contests over control of resources. While the extent to which project-specific measures can mitigate political risks is limited, the project design includes specific steps and actions to build public support through broader stakeholder participation, strategic communication and outreach. Governance risks, on the other hand, will be mitigated through (i) implementation of the institutional strengthening activities proposed under the project; (ii) dialogue and close collaboration with Government entities, as well as proactive engagement by the World Bank team and management as issues arise; (iii) use of performance-based grants to incentivize communities and local governments to maintain focus on results rather than on inputs or processes; (iv) use of alternative delivery models involving partnerships with private sector to complement local government efforts; (v) all performance-based grants under the project will be subject to independent verification of performance; (vi) an independent advisory panel will be constituted to assist MoLWD in evaluating matching grant proposals for agriculture, as well as grant proposals for plantation forestry; and (vii) leveraging digital technologies, including ICT tools and geo-spatial information systems to monitor and pay beneficiaries based on results.

**85. Macroeconomic risks are also Substantial.** Malawi's macro-economic situation is erratic and highly vulnerable to weather and policy-related shocks. The COVID-19 pandemic is also likely to slow down economic activity in the medium term. Further, the prolonged energy crisis continues to dampen investor confidence affecting key economic sectors especially the service sector which is still at its infancy in Malawi. The resultant rising inflation, exchange rate instability and continued currency depreciation significantly weaken economic activity. Although macroeconomic conditions in the country have improved recently (inflation is down to single digits and fiscal deficit reduced), the prevailing macroeconomic instability, currency fluctuation and tight fiscal space may undermine the achievement of the project objectives, especially if it leads to a reduction in the availability of counterpart funds or an increase in the price of imported inputs. These risks will be mitigated in the following ways: (i) counterpart funding is set at a minimal level in the project's financing structure; (ii) substantial price contingencies have been included in the final project cost estimates; and (iii) most of the project interventions will be community-level activities (including labour-intensive works) which are less susceptible to macro-economic instability.

**86. Sector strategies and policy risks are Moderate.** Sector policies and strategies are generally adequate for the project. Malawi already has sound laws, policies, strategies and guidelines covering agriculture, land issues, climate services, environment, and water resources. However, implementation and enforcement remain weak and uneven. Moreover, some agricultural policies (e.g., farm input subsidy program) have worked against sustainable agricultural development in unintended ways<sup>32</sup> – contributing to land degradation and reducing resilience. These risks will be mitigated by engaging in active policy dialogue at the high level and embedding the project's interventions within a broader framework supported by other partners and linked to Malawi's international commitments, such as the Bonn Challenge<sup>33</sup>. Also, the project design uses performance-based grants to incentivize improvements in the enabling institutional environment for natural resources management, including the implementation of existing policies and strategies

**87. Technical design risk is Substantial.** While the technologies for sustainable landscape management are well tested in Malawi and elsewhere, the overall design of the project is inherently complex as it includes multiple types of investments, implementing agencies and stakeholders. The level of coordination required across numerous agencies and stakeholders poses a risk to the achievement of project objectives. This risk will

<sup>32</sup> For instance, the FISP program accounts for a large portion (75%) of agricultural spending. This has crowded out expenditures for other forms of agricultural spending (e.g. extension services) that could help farmers address land degradation.

<sup>33</sup> The Bonn Challenge is a global effort to bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030



be mitigated by ensuring that the responsibilities of individual government departments are defined in the project documentation. The project will also continue to rely on the existing Multi-Sectoral Technical Team (TT) for coordination.

**88. Risks related to institutional capacity and sustainability are Substantial.** Project implementation will be led by MoIWD, working in partnership with other ministries, principally MoNRM, MoAFS, and MoETW<sup>34</sup>. All these have limited human (skills and number of staff) and financial resources. The situation is worse at the district and local levels, partly because of the slow pace of decentralization and the severe funding constraints. Extension staff at the district level are at the frontline of GoM's fight against natural resources degradation. However, the district extension service remains severely underfunded, understaffed and in most cases, extension workers lack the requisite capacity and incentives to perform. While it is beyond the scope of this project to address systemic capacity issues within districts<sup>35</sup>, some actions have been agreed to mitigate risks to the project. First, the project will promote a pluralist approach to extension service provision involving different players (e.g., district, NGOs, individuals, private sector) and different methods (e.g., farmer field schools, lead farmer approaches etc). District Councils (DCs) will not be the sole providers of extension services. CMCs will have the flexibility to choose the type of service provider – either public (DCs) or private (NGOs, private sector etc). Second, where a CMC decides to use the public extension service, the CMC will enter a Memorandum of Understanding with the DCs to clarify expectations and service standards. Further, to enhance accountability, MoIWD will sign a performance agreement with the DCs. The project will finance reasonable incremental operating costs for DCs to enable the delivery of extension services in the project area. Also, DCs will receive performance grants contingent upon achieving the minimum performance requirements as stipulated in the performance agreement.

**89. Fiduciary risks are Substantial.** Both procurement and FM risks are assessed as substantial. The FM risk rating mainly due to weaknesses in the FM arrangements of the districts and the government departments/agencies that will receive performance-grants (i.e., DoF, DNPW, NWRA). The significant challenges are weak internal audit function, poor management of bank accounts, delayed financial reports, use of excel spreadsheets for transaction processing and reporting and inadequate FM staff. These weaknesses are exacerbated by weak public finance management control environment characterized by poor managerial accountability and the absence of consistent application of disciplinary measures. The other deficiencies noted during SRBMP implementation was poor planning and budgeting leading to cost overruns and delays in implementation. Specific actions have been agreed to mitigate these risks as outlined in Annex 2. On procurement, the key risks include inadequate procurement capacity due to lack of experienced and competent procurement staff; inefficiencies and delays in procurement process, especially preparation of Terms of Reference (ToRs) and bid specifications; insufficient competition in procurement; weak contract management; fraud and corruption risk; weak complaint redress system; inadequate evaluation procedures; and poor record keeping. These risks will be mitigated through specific measures that are outlined in detail in the Project Procurement Strategy for Development (see Annex 2 for details).

<sup>34</sup> In March 2020, the President of the Republic of Malawi restructured some ministries as follows: The Ministry of Agriculture, Irrigation and Water Development (MoAIWD) was split into two ministries – i.e. Ministry of Agriculture and Food Security (MoAFS) and Ministry of Irrigation and Water Development (MoIWD). Also, the Ministry of Natural Resources, Energy and Mining (MoNREM) was split into three ministries – i.e. Ministry of Energy (MoE), Ministry of Natural Resources and Mining (MoNRM) and Ministry of Environment, Tourism and Wildlife (MoETW). These changes however do not affect the multi-sectoral coordination framework (through the TT) that is already place.

<sup>35</sup> GoM requested World Bank support on strengthening local government capacity, and a separate operation (Governance for Service Delivery Project) is under preparation.



90. There are additional procurement risks due to COVID-19, including (i) limited competition due to some competent bidders refraining from participating in the bidding process; and (ii) challenges of bid submission due to COVID-19 movement restrictions imposed by many countries worldwide. These will be mitigated by enhanced engagement of bidders through: (i) online meetings; (ii) organizing travel clearances for contractors and consultants to visit sites, in case of government imposed movement restrictions, and (iii) permitting submission of bids by third party agents—with risk of delayed delivery of bids borne by the contractor/consultant.

91. **Environmental and social risks are Substantial.** The project will have a highly positive impact overall from an environmental standpoint by improving agricultural land management, reducing erosion and sedimentation, increasing forest cover, and strengthening protected areas. Nonetheless, some of the project's interventions could lead to unintended, adverse environmental or social impacts. Potential risks include permanent or temporary loss of land, access restrictions to natural resources and disruption to livelihoods, and possible labor influx from outside of the project area exacerbating risks associated with disease transmission and spread of HIV, potential for GBV/SEA and construction-related health and safety concerns for both laborers/workers and surrounding communities. To manage these risks, the MoIWD has prepared an ESCP that is acceptable to the World Bank. The ESCP specifies the studies and actions to be carried out during implementation, along with the agreed-upon dates for their completion. Relevant types of subprojects would require an ESMP and—if needed for higher-risk investments—an ESIA, consistent with Malawian legal requirements as well as the new World Bank Environmental and Social Framework (ESF). Resettlement Plans will be prepared as needed for project investments involving land acquisition, involuntary taking of land, or new restrictions on land use. A Process Framework has been prepared to address potential livelihoods impacts from project-supported restrictions of access to natural resources in Forest Reserves and other protected areas. The project will also support environmental and social capacity building for the relevant implementation entities at the national and district levels.

92. In addition, COVID-19 presents an emerging risk which was not taken into consideration during preparation of the environmental and social risk management instruments. COVID-19 pandemic poses high health risk to the community through interactions with project staff. There is also risk to laborers and contractors and consultants. Specific guidance on how to handle and manage project implementation in the COVID-19 period, will be included in the Project Implementation Manual and Labor Management Procedures, and contractors shall be required to develop COVID-19 Standard Operating Procedures as part of Contractors' ESMP following available guidance from the national government, World Health Organization (WHO) and the World Bank.

93. **The project is also exposed to exogenous climate risks.** Malawi is rated as "highly exposed" to climate change. The country has experienced climate and geophysical hazards in the past and is expected to experience these in the future with high intensity, frequency, or duration. Climate and geophysical hazards that are relevant to the project include extreme temperature and droughts, along with intense precipitation and floods. Drought presents a moderate risk to project implementation, since it would affect or limit the growth of tree and shrub seedlings planted, particularly in moisture-deficit areas. As a result, project results related to reforestation might not be achieved. Similarly, due to unexpectedly high rainfall intensity, some built structures (such as check dams, roads, and water harvesting trenches) could be destroyed, and cropland could be flooded. The mitigation of these risks is embedded in the technical design of the project itself, which aims to reduce drought and climate change impacts. Additional measures will be explored to enhance the resilience of built green infrastructure by reviewing and updating (where necessary) the specifications in the Government's



National Guidelines for Integrated Catchment Management<sup>36</sup>. In addition, project activities focusing on improving climate information services, promotion of climate-smart agriculture, livelihood diversification, value chain development and institutional capacity development will contribute to mitigating these risks.

**94. Stakeholder risks are Substantial.** The project will bring together a diverse range of stakeholders (farmers, government agencies at the central level, local government/district councils, NGOs, Civil Society Organizations (CSOs), private sector etc) around a common goal – reversing land degradation. Currently, GoM lacks institutionalized mechanisms for multi-sectoral, multi-stakeholder coordination around landscape management. Initiatives are fragmented across different ministries and agencies with little or no coordination. The capacity within MoIWD to influence and build a coalition of partners is still limited and finding the right incentives to change farmer behavior (concerning sustainable land and water management) continues to elude policymakers in Malawi. These risks will be mitigated through inclusive discussions and an adequate level of representation from relevant stakeholders and tailored communication and capacity building during project implementation. In order to mitigate the risk of COVID-19, the project will use communication channels that do not necessitate the congregation of stakeholders. Further, the project will support a social marketing campaign, as well as financial incentives to influence farmer behavior.

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<sup>36</sup> for example, including guidelines for community roads to also serve as water harvesting structures



## VII. RESULTS FRAMEWORK AND MONITORING

### Results Framework

COUNTRY: Malawi

Malawi Watershed Services Improvement Project

#### Project Development Objectives(s)

Increase adoption of sustainable landscape management practices and improve watershed services in targeted watersheds

#### Project Development Objective Indicators

Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
<strong>Increase adoption of sustainable landscape management practices</strong>								
Proportion of target farmers adopting sustainable landscape management practices (Percentage)		0.00	10.00	15.00	35.00	50.00	60.00	70.00
Land area under sustainable landscape management practices (CRI, Hectare(Ha))		0.00	9,500.00	19,000.00	45,000.00	65,000.00	75,000.00	95,000.00
Land area showing an increase in Normalized Difference Vegetation Index (NDVI) and the Land Surface Water Index (LSWI), correcting for short-term climate effects		0.00	5,000.00	10,000.00	25,000.00	35,000.00	40,000.00	50,000.00



Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
(Hectare(Ha))								
<b>Improve watershed management services</b>								
Number of people gaining access to water for productive use (Number)		0.00	0.00	0.00	20,000.00	25,000.00	35,000.00	42,000.00
Proportion (%) of target farmers benefiting from an increase in production sold to the markets and/or an increase in income from marketed products (Percentage)		0.00	0.00	15.00	25.00	35.00	40.00	50.00

### Intermediate Results Indicators by Components

Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
<b>Scaling up Landscape Restoration</b>								
Agricultural land area with soil and water conservation measures (Hectare(Ha))		0.00	5,000.00	10,000.00	15,000.00	20,000.00	25,000.00	30,000.00
Land area with improved agricultural technologies applied (Hectare(Ha))		0.00	2,500.00	5,000.00	12,000.00	17,000.00	20,000.00	25,000.00
Forest area restored, reforested or under improved management		0.00	3,500.00	10,000.00	18,000.00	25,000.00	30,000.00	35,000.00



Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
(Hectare(Ha))								
Area of vegetative riparian buffer established along major rivers and streams in the targeted watersheds (Hectare(Ha))	0.00	500.00	1,000.00	2,500.00	3,000.00	5,000.00	5,000.00	
Proportion of households within targeted catchments engaged in SLM practices (Percentage)	0.00	10.00	20.00	40.00	60.00	70.00	80.00	
Yields of selected agricultural commodities supported by the project (Percentage)	0.00	0.00	10.00	30.00	40.00	50.00	70.00	
Number of female farmers benefiting from an increase in production sold to the markets or an increase in income from marketed products (Number)	0.00	0.00	1,000.00	2,500.00	3,500.00	4,000.00	5,000.00	
Proportion of project beneficiaries that are satisfied with the services provided under the project (Percentage)	0.00	0.00	50.00	75.00	75.00	75.00	75.00	
Number of female farmers gaining tenure security through land certification (Number)	0.00	0.00	2,500.00	3,500.00	6,500.00	6,500.00	6,500.00	
<b>Improving Watershed Services</b>								
Average performance score for project-supported	0.00	60.00	60.00	60.00	60.00	60.00	60.00	60.00



Indicator Name	PBC	Baseline	Intermediate Targets					End Target
			1	2	3	4	5	
watershed management institutions (Percentage)								
Number of farmers receiving payments under the pilot Payment for Watershed Services (PWS) scheme (Number)	0.00	0.00	0.00	10,000.00	20,000.00	30,000.00	30,000.00	
Percentage reduction in sediment yield in selected Shire river tributaries (Percentage)	0.00	0.00	0.00	10.00	15.00	20.00	20.00	
Number of multiple-use water sources developed (Number)	0.00	0.00	5.00	19.00	30.00	38.00	38.00	
Area provided with new/improved irrigation or drainage services (CRI, Hectare(Ha))	0.00	0.00	250.00	1,000.00	1,500.00	2,400.00	2,400.00	
Farmers receiving agro-weather information services (Number)	0.00	0.00	0.00	3,000.00	5,000.00	7,000.00	8,000.00	
<b>Technical and Project Management Support</b>								
A biophysical and ecological monitoring system developed and used (Text)	There is no system in place for monitoring biophysical and ecological changes in the targeted watersheds	Develop framework and indicators for biophysical and ecological monitoring and prepare a plan for implementation; Conduct baseline biophysical and ecological survey in target watersheds	Design and test a monitoring system for tracking biophysical and ecological changes in the target watersheds	Biophysical and ecological monitoring system implemented in at least 10 sub-catchments in the project area	Biophysical and ecological monitoring system implemented in at least 20 sub-catchments in the project area	Biophysical and ecological monitoring system implemented in at least 25 sub-catchments in the project area	Biophysical and ecological monitoring system implemented in at least 30 sub-catchments in the project area	



Monitoring & Evaluation Plan: PDO Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Proportion of target farmers adopting sustainable landscape management practices	This indicator measures the adoption rate for sustainable landscape management practices. For purposes of this project, sustainable landscape management practices refer to a combination of at least two technologies or practices (agronomic, vegetative, structural, and management measures) applied to improve land quality and prevent degradation and/or restore already degraded landscape. The suite of technologies and practices appropriate to the Malawian context are described in the National Catchment Management Guidelines and Manual. These include physical soil	Mid term and annually thereafter Mid term and annually thereafter	Project MIS and monitoring reports	Panel survey at mid-term and annually thereafter.	Department of Land Resources Conservation (DLRC)



	<p>and water conservation techniques (e.g. marker and contour ridges, ridge alignment, box ridges, water harvesting, infiltration ditches, gully plugs, check dams, etc); vegetative river/stream-bank restoration; agricultural technologies (i.e., agroforestry, farmer-managed natural regeneration), community forestry and woodlots and plantation forestry.</p> <p>Adoption refers to a change of practice or change in the use of a technology or practice promoted or introduced by the project. For purposes of this project, a farmer will be counted as an adoptor if he/she practices at least two technologies or practices on agricultural land for at least three consecutive farming seasons or any other technology on other land-use types.</p>			
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Land area under sustainable landscape management practices	The indicator measures, in hectares, the land area for which new and/or improved sustainable landscape management practices have been introduced. Land is the terrestrial biologically productive system comprising soil, vegetation, and the associated ecological and hydrological processes; Adoption refers to change of practice or change in the use of a technology promoted or introduced by the project; Sustainable landscape management (SLM) practices refers to a combination of at least two technologies and approaches to increase land quality and restore degraded lands for example, agronomic, vegetative, structural, and management measures that, applied as a combination, increase the connectivity between protected areas, forest land,	Annual	Project MIS, and monitoring reports	Data on this indicator will be collected using a multi-layered approach, involving field surveys, mobile-based reporting with geo-tagged photos, unmanned aerial vehicle (UAV) surveys, remote sensing, and satellite imagery	DLRC and Department of Forestry (DoF)



	rangeland, and agriculture land.				
Land area showing an increase in Normalized Difference Vegetation Index (NDVI) and the Land Surface Water Index (LSWI), correcting for short-term climate effects	This indicator captures the results of the adoption of SLM practices in the target watersheds by measuring the increase in vegetation cover corrected for short-term weather effects (e.g. prolonged dry period) through the NDVI and in soil water content through LSWI. The NDVI uses the visible and near-infrared bands of the electromagnetic spectrum to analyze remote sensing measurements to determine the extent to which a target contains live green vegetation. LSWI uses the shortwave infrared and near-infrared bands of the electromagnetic spectrum to analyze remote sensing measurements (based on satellite imagery data) to determine the amount of water in vegetation and soil. The increase in NDVI and LSWI for a given micro watershed to count towards	Mid term and end-term	Remotely sensed data	This indicator will be measured using remotely sensed data. Both NDVI and LSWI for the project area will be adjusted for short-term weather effects.	DLRC, DoF and Department of Surveys



	the target for this indicator should be at least 10%, correcting for short-term weather effects.				
Number of people gaining access to water for productive use	This indicator measures improved access to water for productive use as a result of investments in enabling watershed infrastructure. Water for productive use means using water for irrigation, livestock, fisheries, and water for small-scale processing. Access means water is either delivered at the point of production or is within 250m from the point of production for the case of water for livestock.	Annual	Household surveys, and reports from Water-User Associations (WUAs)	A household survey will be conducted to determine changes in access to water for productive use. Additional data will be collected from WUAs managing the water schemes	Department of Irrigation Services (Dol), Department of Water Resources (DWR) and WUAs
Proportion (%) of target farmers benefiting from an increase in production sold to the markets and/or an increase in income from marketed products	This indicator tracks the share of target farmers benefiting from an increase in products (agricultural, aquaculture, forest-based) sold to the markets and/or an increase in income from marketed products, as a result of project interventions	Annual	Sample-based value chain survey reports, supplemented with data from WUAs and Village Natural Resources	This indicator will be measured through sample-based value chain surveys and data from WUAs (for the case of irrigated agriculture) ad VNRMCS (for other products)	Department of Agricultural Extension Services (DAES), DLRC, VNRMCS, and Department of Crop Development (DCD), Department of Animal Health and Livestock Development (DAHLD)



			Management Committees (VNRCMs)		
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Monitoring & Evaluation Plan: Intermediate Results Indicators					
Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Agricultural land area with soil and water conservation measures	This indicator tracks the area of cropland where soil and water conservations have been applied. Soil and water conservation measures include marker and contour ridges, ridge alignment, box ridges, water harvesting, infiltration ditches, gully plugs, check dams, etc	Annual	Project M&E Reports	Data on this indicator will be collected using a multi-layered approach, involving field surveys, mobile-based reporting with geo-tagged photos, and unmanned aerial vehicle (UAV) surveys,	VNRCMs, Catchment Management Committees (CMCs), District Agricultural Extension Development Officer (AEDO), and DLRC
Land area with improved agricultural technologies applied	This indicator tracks the adoption of improved agricultural technologies promoted by the project, including conservation agriculture, agro-forestry, farmer-managed natural regeneration etc.	Annual	Project M&E reports	Data on this indicator will be collected using a multi-layered approach, involving field surveys, mobile-based reporting with geo-tagged photos, unmanned aerial vehicle (UAV) surveys	VNRCMs, CMCs, Districts (AEDO), DLRC



Forest area restored, reforested or under improved management	This indicator tracks the area of natural forest restored, reforested or under improved management; and area under productive plantation forestry management	Annual	Project MIS, and monitoring reports and remotely sensed data	Data on this indicator will be collected using a multi-layered approach, involving field surveys, mobile-based reporting with geo-tagged photos, unmanned aerial vehicle (UAV) surveys, remote sensing, and satellite imagery	VNRMCs/CMCs, DoF
Area of vegetative riparian buffer established along major rivers and streams in the targeted watersheds	This indicator tracks the area of vegetative riparian buffer established along major rivers and streams in the targeted watersheds	Annual	Project MIS, monitoring reports	Data on this indicator will be collected using a multi-layered approach, involving field surveys, mobile-based reporting with geo-tagged photos, and unmanned aerial vehicle (UAV) surveys	National Water Resources Authority (NWRA), and DLRC
Proportion of households within targeted catchments engaged in SLM practices	This indicator tracks the proportion of households within targeted catchments who are engaged in SLM practices. A household will be counted towards this indicator if it is engaged in at least two technologies or practices introduced or	Annual	Project MIS, project reports	Data on this indicator will be collected using a multi-layered approach, involving field surveys, mobile-based reporting with geo-tagged photos, unmanned aerial vehicle (UAV) surveys	VNRMC/CMC, Districts (AEDO), DLRC



	promoted by the project				
Yields of selected agricultural commodities supported by the project	This indicator tracks the increase in agricultural productivity among farmers supported by the matching grant program.	Annual	Project MIS reports	Sample value chain surveys	DAES, DCD and DLRC, DAHLD
Number of female farmers benefiting from an increase in production sold to the markets or an increase in income from marketed products	This indicator tracks the number of female farmers benefiting from an increase in products (agricultural, aquaculture, forest-based) sold to the markets or an increase in income from marketed products, as a result of project interventions	Annual	Sample-based value chain survey reports, supplemented with data from WUAs and Village Natural Resources Management Committees (VNRMCs)	This indicator will be measured through sample-based value chain surveys and data from WUAs (for the case of irrigated agriculture) ad VNRMCs (for other product)	Department of Agricultural Extension Services (DAES), DLRC, VNRMCs, and Department of Crop Development (DCD) and Department of Animal Health and Livestock Development (DAHLD)
Proportion of project beneficiaries that are satisfied with the services provided under the project	This indicator tracks beneficiary satisfaction with the services provided under the project	Annual	Beneficiary survey reports	Beneficiary surveys	DLRC and DAES
Number of female farmers gaining tenure security through land certification	This indicator tracks the number of female farmers gaining tenure security through the land registration activities supported by the project.	Annual	Project MIS and monitoring reports, district land administration records	Data will be collected by querying the land administration records at the district level	Land Reform Implementation Unit (LRIU) and DoS



Average performance score for project-supported watershed management institutions	This indicator tracks the annual average performance score for project-supported watershed institutions on their performance scorecards	Annual	Annual performance assessment reports	Data on this indicator will be collected through an annual performance assessment of the watershed institutions, based on their respective performance scorecards as per the performance agreements signed with MoIWD	Independent verification agent - to be engaged by MoIWD
Number of farmers receiving payments under the pilot Payment for Watershed Services (PWS) scheme	This indicator tracks the number of farmers receiving payments under the pilot PWS scheme	Annual	Project MIS, monitoring reports, PWS contracts and verification reports	Methodology for data collection will be specified in the PWS contracts to be signed with farmers	DLRC, NWRA, biophysical monitoring consultant
Percentage reduction in sediment yield in selected Shire river tributaries	This indicator tracks the reduction in sediment yield in the Shire River tributaries targeted under the PWS scheme	Mid-term and end-of-project	Biophysical monitoring system - to be established under the project (component 3), sediment	Sediment monitoring stations to be established under the project	DLRC, NWRA (supported by a specialized biophysical monitoring consultant), PWS consultant



			monitoring stations		
Number of multiple-use water sources developed	This indicator tracks the number of multiple-use water sources developed under the project. Multiple-use water sources include small to medium scale dams, rainwater harvesting structures, high yielding boreholes, and associated conveyance infrastructure	Annual	Project MIS, construction progress reports,	Data will be collected through construction progress reports	DWR
Area provided with new/improved irrigation or drainage services	This indicator measures the total area of land provided with irrigation and drainage services under the project, including in (i) the area provided with new irrigation and drainage services, and (ii) the area provided with improved irrigation and drainage services, expressed in hectare (ha).	Annual	Construction progress reports, WUA reports	Construction progress reports	Dol, WUAs
Farmers receiving agro-weather information services	This indicator tracks the number of farmers receiving agro-weather information services.	Annual	Agro-weather product/tool developed with support from the product	The agro-weather product will have an in-built mechanism for tracking the number of farmers receiving the information	DCCMS, DAES



A biophysical and ecological monitoring system developed and used	<p>This indicator tracks progress on key milestones for the establishment and use of a biophysical and ecological monitoring system.</p> <p>A biophysical and ecological monitoring system is a GIS-based information system that is able to systematically capture, analyze and visualize spatially-referenced data on biophysical and ecological changes occurring in a watershed as a result of project interventions.</p> <p>The system must be able to capture, analyze and visualize spatially-referenced data on the several biophysical, ecological and ecosystem parameters, including but not limited to: tree/vegetation cover, soil depth, soil fertility, soil erosion, soil moisture,</p>	Annual	Progress reports	Progress reports	DLRC, DNPW, DoF, LUANAR and consultants



	<p>sediment yields, groundwater levels, surface water quality, biodiversity, etc. The system must also be able to track key project indicators such as SLM adoption rates, land area under SLM, as well as data on improvements in watershed services supported under the project.</p> <p>The system will be considered implemented if at least the baseline biophysical and ecological data from the 10 sub-catchments has been entered in the system.</p>			
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**ANNEX 1: Detailed Project Description**

**COUNTRY: Malawi**  
**Malawi Watershed Services Improvement Project**

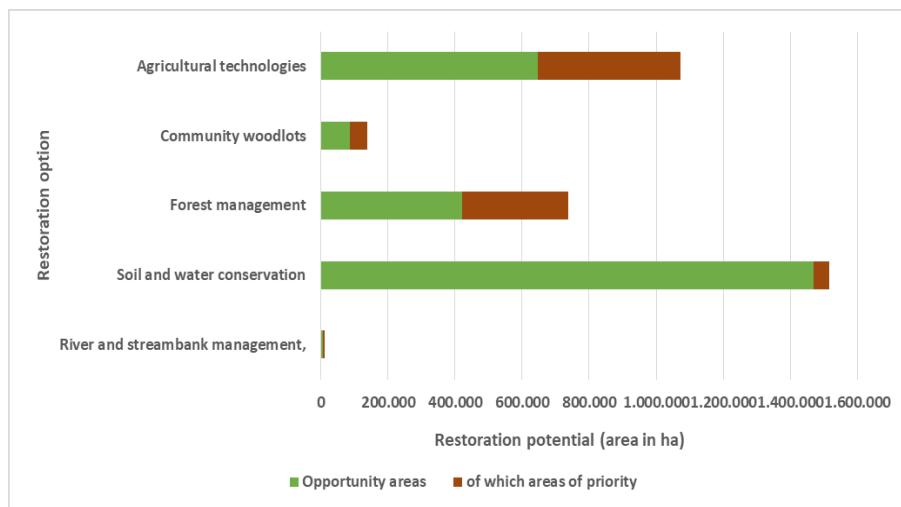
**National Forest and Landscape Restoration Strategy**

1. **Land degradation represents a major constraint to social and economic development in Malawi.** Its significant impacts include lower agricultural productivity, long term food insecurity, declining watershed services (such as a poor water quality and reduced water availability), and a reduction in hydropower generation. Land degradation also reduces resilience to severe weather events and longer-term climate change. The main drivers behind land degradation in Malawi, particularly in the middle and upper part of the Shire River Basin, are imperfect knowledge about sustainable farming practices, increasing demand for agricultural land and wood fuels associated with a growing population. Poor soil management, combined with erosive rainfall, is the leading cause of significant loss of fertile topsoil. Estimates suggest that the use of land degrading management practices on rain-fed maize in Malawi leads to a 22 percent decline in yield over 30 years.
2. Restrictions on clearing remaining natural forests exist, but local enforcement is weak. The regulatory framework for the agriculture sector has significantly improved due to updated policies. However, poor smallholder farmers remain locked in low productivity subsistence farming, which is exacerbated by thin and distorted maize markets. Moreover, disproportionate public expenditures on subsidies crowd out financial resources for extension services and land stewardship initiatives, creating severe impediments for the widespread adoption of improved and sustainable agricultural technologies. In response, numerous laws, strategies, and institutions have been formed recently to address these issues.
3. **The 2016 National Forest and Landscape Restoration Strategy (NFLRS) estimates that nearly 7.7 million ha of degraded land (about 80 percent of Malawi's total land area) requires restoration intervention.** GoM has committed to restoring 4.5 million ha of the degraded landscape by 2030. The NFLRS includes five restoration options for scaling up. These include (i) agriculture technologies; (ii) community forests and woodlots; (iii) forest management; (iv) soil and water conservation; and (v) river and streambank management.
4. **The upper and middle parts of the Shire River basin alone provide the opportunity to restore more than 2.6 million ha of degraded land and forests – more than half (57 percent) of the NFLR target.** A recent prioritization study shows that out of the 2.6 million ha, more than 845,000 ha should be targeted as a priority because here exists the highest potential for realizing significant impacts on poverty reduction, food security, and biodiversity conservation (see Figure 1.1).
5. **The study further shows that the adoption of modern agricultural technologies constitutes the restoration options with the highest share of the priority area, followed by forest management (Figure 1.1).** Soil and water conservation constitute the restoration option with the largest total restoration potential. However, the share of the priority is rather small. River and stream-bank management would not cover a large area. Nevertheless, almost the entire area (84 percent) is as a priority area. Further, the detailed spatial analysis identified Balaka, Machinga and Mangochi as the three districts with the highest restoration potential, in addition to the four districts targeted under SRBMP (i.e., Blantyre, Zomba, Neno, Ntcheu). Balaka District stands out in terms of the overall potential for reducing land degradation and alleviating poverty (see Map 3 in Annex 5). Particularly promising is the promotion of agriculture technologies for drought resilience and food security.



Woodlots, soil and water conservation, and forest management are not significant land restoration options. However, river and streambank management are critical, given the importance of hydropower in the south of the district. In Machinga and Mangochi Districts, forest management, agricultural technologies, soil and water conservation, and community woodlots are the most appropriate restoration options (Annex 5, Map 4 and 5).

**Figure 1.1 – Total Restoration Potential in the Upper and Middle Shire River Basin by Restoration Option**



Source: UNIQUE (2018)

6. The NFLRS lays out a clear strategy for addressing land degradation in Malawi through the combined action of both the public and private sectors. It advocates for private sector involvement in restoration efforts and support for market development. The strategy also calls for a shift of domestic government budget allocations from subsidies for mineral fertilizers via the Farm Input Subsidy Programme (FISP) to support a broader land stewardship program targeting priority catchments. The proposed project is the first large scale operation in support of GoM's aspiration as laid out in the NFLRS.

7. The project will support the scale-up of landscape restoration in the Shire River Basin while at the same time building the institutional and financing mechanisms (based on improved watershed services) that are needed to sustain investments beyond the project period. Investment activities are organized into three components, as described in the following paragraphs.

### **Component 1 – Scaling up Landscape Restoration (US\$53 million equivalent)**

8. This component aims to scale up landscape restoration interventions in the middle and upper Shire River Basin while enhancing the livelihoods of small-holder farming communities, addressing climate change vulnerabilities by making the farmers and the watershed more resilient to droughts and floods and improving or preserving the carbon sequestration capacity of the watershed. Investment activities are organized in four sub-components as described below.

#### ***Sub-component 1.1 - Performance-Based Grants for Landscape Restoration (US\$32.5 million)***

9. The project will provide performance-based grants to scale up landscape restoration in the upper and middle Shire. Restoration activities will include physical soil and water conservation techniques (e.g., marker and



contour ridges, ridge alignment, box ridges, water harvesting, infiltration ditches, gully plugs, check dams etc); vegetative river/stream-bank restoration, agricultural technologies (i.e. conservation agriculture, agroforestry, farmer-managed natural regeneration), community forestry and woodlots and plantation forestry. The project will target a total land area of approximately 309,500 ha, consisting of (i) the four degraded catchment areas targeted under the SRBMP, covering an area of approximately 129,500 ha; (ii) new catchment areas to be delineated in Balaka, Machinga, and Mangochi districts, covering an area of about 180,000 ha (for details, see Table 1.1 below and maps in Annex 5).

**Table 1.1:** Project Catchment Characteristics

District	Catchment	Area (ha)	No. of Sub-Catchments	No.of micro-catchments covered by VLAPs	Average Area per VLAP (ha)
<b>Ntcheu</b>	Upper Lisungwe	26,000	4	60	433
<b>Neno</b>	Upper Wamkulumadzi	29,500	4	70	421
<b>Blantyre</b>	Blantyre/Kapichira	33,000	4	79	417
<b>Zomba and Machinga</b>	Chingale	41,000	5	96	427
<b>Balaka</b>	<i>To be delineated</i>	180,000	18	360	500
<b>Machinga</b>	<i>To be delineated</i>				
<b>Mangochi</b>	<i>To be delineated</i>				
<b>Total</b>		<b>309,500</b>	<b>35</b>	<b>665</b>	

10. The project target is to rehabilitate about **30 percent (95,000 ha)** of this landscape by project close. To achieve this target, two types of grants will be provided: (i) grants to CMCs and VNRMCs to finance landscape restoration interventions based on approved catchment or sub-catchment management plans and village-level action plans (also known as VLAPs or micro-catchment plans); and (ii) grants to community groups and the private sector to establish tree plantations, primarily for sustainable timber and wood fuel production. The following paragraphs provide a brief description of each grant mechanism. Details will be provided in the Project Implementation Manual (PIM) and the performance agreements that will be signed between MoIWD and the grant recipients.

11. **Performance-based grants to CMCs and VNRMCs.** This grant will consist of two parts: (i) a fixed part linked to achievement of critical institutional actions – i.e., legal establishment of a CMC per the provisions of the Water Resources Act 2013; an approved catchment or sub-catchment management plan prepared in a participatory manner, and at least half of the VNRMCs in the CMC's catchment area are functional and have an approved VLAP; and (ii) a variable part linked to the verified land area under sustainable landscape management practices in the micro-catchment covered by each VNRMC. A land area will be considered under SLM if at least two technologies or practices are applied to improve land quality on agricultural land and any other technology on other land-use types. The suite of technologies and practices appropriate to the Malawian context are described in the National Catchment Management Guidelines and Manual.

12. The fixed grant will be disbursed annually to the CMC as the apex body for catchment management, upon verification of the institutional actions. The fixed grant will finance inputs, equipment, and services required to implement restoration activities outlined in the VLAPs in the CMC's catchment area. The fixed grant will fund start-up and operating costs for the CMC until the third year of the project. Beyond the third year, the CMC's operating costs will be covered through NWRA transfers, per the revenue sharing model prescribed in the Water Resources Act of 2013.



13. The variable grant, on the other hand, will be disbursed directly to the VNRMCs upon verification of land area under SLM. Given that the fixed portion of the grant covers the costs of implementing the VLAPs, the variable grant is essentially a financial incentive for VNRMCs to achieve their restoration targets as laid out in their VLAPs. The grant amount will be determined annually based on a linearly scalable formula that rewards VNRMCs for increasing the land area under sustainable landscape management. The grant will be disbursed to a Community Environment Conservation Fund (CECF) managed by the VNRMC and will be used to provide micro-credit to community members involved in implementing VLAP activities. The CECF was successfully piloted under SRBMP as a community-level incentive to encourage adoption and participation in sustainable landscape management interventions<sup>37</sup>. Based on the SRBMP experience, the variable grant has been set at a rate of **US\$75 per ha, up to a maximum of US\$1,500 per VNRMC per year**. This combination of fixed grants and variable grants (or CECF transfers) is expected to result in restoration of approximately **70,000 ha** of the targeted landscape by project closing, comprising of 30,000 ha of land under soil and water conservation measures; 25,000 ha under improved agricultural technologies; 10,000 ha of community forests/woodlots regenerated either naturally or through planting; and 5,000 ha of vegetative riparian buffers. These interventions will help mitigate the impacts of floods (by restoring forest cover and vegetative riparian buffers along rivers and streams) and droughts (by conserving water and increasing soil moisture content). Further, SLM practices (such as planting new community forests, rehabilitating degraded forests and enriching existing forests, and practicing conservation agriculture) are known to increase the rate and quantity of carbon sequestration in biomass, and thus will help preserve or improve existing carbon pools in the watershed and mitigate climate change.

14. **Performance-based grants to community groups and the private sector.** Performance-based grants will be provided to private sector individuals, small to medium forest enterprises, community groups or wood producer associations to establish tree plantations in the target catchments to complement the restoration efforts by CMCs and VNRMCs. The grants will lower the establishment costs to tree growers and thus encourage the establishment of productive forestry in the target catchment areas. The grants will also incentivize plantation of fast-growing species suitable for poles and biomass fuels as well as bamboos suitable for planting in more marginal areas where slope protection and soil restoration will be important objectives for plantation establishment. Land eligible for planting will include private land, customary land, denuded forest areas on customary land, and within forest reserves categorized for production/plantation forestry. For the latter, DoF has confirmed there are substantial areas of denuded land within forest reserves in the Shire Basin that will be made available for planting under contracts with private sector tree growers.

15. To operationalize the grant mechanism, the Department of Forestry (DoF) will issue a request for expressions of interest from interested tree growers. Tree growers will be selected based on transparent criteria to be outlined in the PIM. Selected tree growers will sign performance contracts with DoF for a minimum area of 25 ha and a maximum of 500 ha. The contract must include an approved forest management plan. The contract will define the planting area and species choice, as well as silvicultural and quality standards – such as the use of planting stock from certified nurseries, use of approved seed sources, minimum 80 percent stocking after three months, basic 1 m diameter ring-weeding protection from livestock and fires and other relevant silvicultural standards. Grant payments will be conditional on compliance with performance contract requirements. The project's support period covers the first two years of establishment only. The grant will be set at a fixed rate of **US\$400 per ha**. The rate was calculated at 50 percent of the average full establishment cost. Payment will be split into three tranches over a three-year contract period. No grant funds will be paid up-front.

<sup>37</sup> World Bank (2019). Shire River Basin Management Project: Implementation Completion and Results Report (ICR). Washington DC, World Bank.



Tree growers must thus start with their resources. Payments will only be made after a site inspection has confirmed the area planted and the standards achieved. This grant mechanism is expected to result in the establishment of approximately **15,000 ha** of plantation forests by project closing. These activities will contribute to increasing vegetation cover, improving or preserving existing carbon pools in the watershed and mitigating the impacts of floods. Further, planting new forests, rehabilitating degraded forests and enriching existing forests will contribute to mitigating climate change as these actions tend to increase the rate and quantity of carbon sequestration in biomass.

16. **Complementary activities.** The above scope represents a major scale-up of the landscape restoration effort in the Shire River Basin. To enhance the chances of success, the project will finance (within the same target watersheds) several complementary activities that have been shown to increase the adoption of sustainable landscape management practices in previous projects in Malawi and elsewhere. First, recognizing that reversing landscape degradation is primarily in the hands of poor small-holder farmers and their communities, many of which are engaged in low productivity subsistence farming, the project design incorporates livelihood-enhancing activities (primarily agricultural livelihoods) to boost household incomes by enabling farmers to invest in sustainable intensification of agriculture, learn new climate-smart farming practices, increase productivity, add value and enhance market access for their produce. To date, Malawi's strategy for increasing agricultural productivity centers disproportionately on fertilizer and seed subsidies, with almost three-quarters of public expenditure in agriculture going to these subsidies. The subsidy policy continues to attract intense public scrutiny and debate, especially with respect to its sustainability. The project will demonstrate other productivity-enhancing measures, routed in improved, climate-smart agricultural (CSA) practices and better land stewardship, not only to enhance livelihoods but also to generate the farm-level evidence needed to inform policy changes.

17. Second, the project will finance advisory and capacity building services to strengthen participatory planning processes at the catchment and micro-catchment level and to help close existing knowledge gaps in SLM, CSA and silvicultural practices. According to the 2014 Welfare Monitoring Survey, only 17 percent of households in Malawi received advice on farm planning and practices, while only seven percent received information on forest and woodlot management. The project will also finance a social marketing campaign to influence farmer adoption behavior. Finally, to empower land-users to invest in sustainable landscape management, the project will fund participatory land-use planning, land demarcation, adjudication, and registration of land parcels to provide security of tenure for farming households. These complementary activities are described in detail in the following paragraphs.

#### ***Sub-component 1.2 - Matching Grants for Enhancing Agricultural-Based Livelihoods (US\$8 million)***

18. The project will provide matching grants to enable cash-constrained farming communities in the Shire River Basin to invest in sustainable intensification of agriculture, increase productivity, add value and enhance market access for produce. Investment support will be provided in selected high-value chains, including horticulture, livestock, and livestock products – beef, dairy, small ruminants (goats, sheep), piggery, and poultry. The aim is to improve productivity, quality, value addition, market access and profitability, which in turn is expected to result in job creation, increased economic opportunities for these farming communities and increased household incomes. Support in horticulture and livestock value chains will also contribute to improved nutritional outcomes as it will enhance the availability of and access to diverse nutrient-dense foods such as fruits and vegetables as well as protein-rich dairy and meat products. Together, these activities will contribute to building the capacity of farmers to adapt to the negative impacts of climate change and to diversify agricultural systems to avoid the impacts climate change.



19. Two types of matching grants will be provided: (i) matching grants to small-holder farmers to enhance on-farm productivity sustainably in selected value chains; and (ii) matching grants to agri-enterprises involved in the selected value chains to increase market access for small-holder farmers. The project aims to support approximately **200 farmer groups** and **60 agri-enterprises**. The following paragraphs provide a brief overview of each grant mechanism. Details are provided in the PIM.

20. **Matching grants for small-holder farmers.** The project will provide smallholder farmers with matching grants to finance investments for increasing on-farm productivity in high potential value chains including horticulture, livestock, and livestock products, including dairy, beef, small ruminants and small-scale piggery and poultry. Grants will be demand-driven and provided for a suite of eligible activities, including, among other things, small farm implements and equipment, climate adaptive technologies such as shade nets, tunnel houses, farmer-led irrigation systems (including water storage, pumping equipment, transmission equipment, and a variety of on-farm equipment such as movable rain-gun sprinkler, fixed sprinkler, drip, drag-hose with nozzle), improved seed varieties and seedlings, improved livestock breeds, agro-processing equipment, packaging equipment, and storage – provided these investments lead to increased production and marketed surplus for the selected value chains. Investment proposals must be consistent with local land-use plans, catchment management plans, and micro-catchment plans (VLAPs) and should promote SLM.

21. Grant values will range between **US\$5,000 and US\$25,000** and will be provided to farmer groups<sup>38</sup>, consisting of no less than 15 households<sup>39</sup>. Farmer groups will be selected for support based on transparent criteria to be outlined in the PIM. Special consideration will be given to applications from women and youth. While the project will finance 100 percent of the grant investment, for grants less than US\$10,000, 95 percent would be in the form of a grant, and five percent would be considered a loan to be repaid with interest into the Community Environmental Conservation Fund (CECF). For grants above US\$10,000, 10 percent of the grant financing would be considered a loan to be repaid with interest in the CECF. The CECF is managed by the VNRMC and will continue to serve as a revolving fund whereby the farmers could take loans from the fund for future investments in their farm operations and repay with interest. An advance of 5-10 percent, depending on the grant value, will be paid upon signing of the contract. The balance will be paid in tranches against agreed milestones, with the final payment made after verification of the investment to ensure that all contractual obligations have been met.

22. To mainstream nutritional activities under the project, each member of the grant recipient group will be required to allocate 5 percent of the grant proceeds for nutritional activities. Eligible activities would include, among other things, improved, bio-fortified varieties of seeds, organic fertilizers, and small farming equipment that would contribute to ensuring year-round production and availability of nutritious foods at the household level. Grants proceeds may also be used to purchase equipment for small-scale processing at the household level, such as equipment for fruit dryers, and canning, labeling, and the like. Such grant support would also serve to provide income-generating opportunities as the processed products (such as jams, sauces, juices) could be sold in local markets for generating increased household incomes.

23. **Matching grants for Agri-enterprises.** Matching grants will be provided to aggregators, processors, and other business enterprises involved in the project value chains to enhance market access for the small-holder

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<sup>38</sup> The grant is designed primarily for small-holder farmers who are currently engaged in subsistence agriculture – to enable them produce beyond subsistence. Existing market-oriented farmers and medium scale farmers who want to expand production and market will be advised to consider applying for larger grants under the Agriculture Commercialization Project (AgCoM, P158434).

<sup>39</sup> However, grants to individual farmers may also be considered for cases where individual farmers want to invest on their own



farmers. Agri-enterprises will have access to matching grants to facilitate investments in postharvest infrastructure and management, including upgrade or construction of processing facilities, cold storage equipment, alignment with international health and safety standards, calibrating/sorting/grading machines and packaging. Grant size will range from **US\$25,000 to US\$50,000**. All grants under this window will require an equity contribution of 30 percent of the total value of the investment. Agri-enterprises will be selected for support based on transparent criteria to be outlined in the PIM. Special consideration will be given to applications from agri-enterprises owned by women and youth. Agri-enterprises must be registered as legal entities and must have been in operation for at least 12 months at the time of submission of the grant applications. Start-up enterprises will not be eligible for project support. To encourage productive partnerships between smallholder farmers and off-takers, agri-enterprise applicants will need to express a clear commitment to source at least 50 percent of the raw materials from local farmers and a willingness to build effective commercial relationships with smallholder suppliers. Business plans for grant support must estimate the quantity and quality of raw materials they are seeking from farmers and express a clear commitment to building good business relations with farmer suppliers. They will also need to provide an estimate of the direct employment their investment will generate.

24. Where feasible, market linkages will be built through supply contracts between producers and buyers or aggregators, which specify the volumes to be traded, quality requirements, delivery mechanisms, and prices. These contracts will also allow for surplus production, over and above the contracted amount, to be sold elsewhere for additional income. Where aggregators/buyers have adequate scale and resources, supply contracts will also provide for input provision, seasonal finance and extension advice. Less formal value-chain links based on good communication, continuous commercial interactions, and trust will be built where aggregators or suppliers lack the capacity to benefit from formal contractual relations.

#### ***Sub-component 1.3 - Advisory, Capacity Building and Social Marketing Services (US\$6.5 million)***

25. This component will finance advisory, capacity building, and social marketing services to close existing knowledge and skills gaps on SLM, CSA, and silvicultural practices among the farming community and district extension staff in the project areas. The component will also finance technical assistance on participatory catchment planning and management, including the formation and training of CMCs and VNRMCs. A detailed description of the activities is provided in the following paragraphs.

26. **Integrated training and advisory services on SLM, CSA and silviculture practices.** According to the NFLRS, the adoption of modern (climate-smart) agricultural technologies is the restoration option with the highest potential and priority in the Shire River Basin. Yet, significant knowledge gaps exist among farmers and extension officers regarding CSA technologies that improve land quality and reduce degradation, while at the same time improving productivity. The project will, therefore, finance an integrated program of training and advisory to increase the knowledge and skills of farmers, extension staff and agri-enterprises in well-tested and proven CSA practices. The program would comprise a menu of CSA technologies, including, among other things, improved and stress-tolerant seed varieties (high yielding varieties, nutrient-dense crops, heat, drought and pest and disease-resistant varieties); conservation agriculture and integrated soil fertility management (minimum tillage, crop rotations, crop residue management, contour ploughing, terracing; soil and water conservation to reduce erosion and increase infiltration; agroforestry (establishment of seed multiplication and tree nurseries, fruit tree cultivation, windbreaks, hedgerows, farmer-managed natural regeneration); climate-smart livestock production (improved animal nutrition, quality control of livestock products, animal disease surveillance). Training and advice will also be provided on sustainable tree-growing practices to enhance knowledge of the use of high-quality seeds, species selection, and silviculture to tree-growers and nursery managers. Silvicultural training will be provided by DoF extension officers, supported by specialized consultants, where necessary. Taken together,



these trainings will enhance the knowledge and skills of farmers on SLM, CSA and silvicultural practices, and therefore enhance their capacity to adapt and absorb the negative impacts of climate change or diversify agricultural systems to avoid the impacts climate change.

27. For SLM/CSA advisory, training, and extension support, the project will adopt the Farmers' Field Schools (FFS) model—a farmer-to-farmer extension approach used under SRBMP and which proved successful in producing a critical mass of adopters at a minimal cost. Training will also include a train-the-trainers program as well as ICT-based knowledge systems for technology demonstration and diffusion (including use short videos). Project interventions will strengthen the extension services by addressing the CSA skills gap of extension officers who will train lead farmers in their agricultural communities, who will, in turn, train follower farmers. Extension officers and farmers will have access to targeted training and field-based learning, including workshops, site visits, demonstrations, and CSA practice pilots.

28. **Establishment and training of farmer groups.** The project will support the formation of approximately **200 farmer groups** and strengthen existing groups. The project will provide training to shift smallholder thinking from subsistence farming to farming as a business by training farmers to conduct gross marginal analyses for their operations; identify local crops with potential for commercialization; grow the identified crops profitably; organize stakeholder forums to exchange information with other like-minded farmers, input suppliers and potential buyers; and help build productive relationships with off-takers. In response to such training, farmers are expected to shift their thinking from "grow and sell" to "grow to sell." The multi-fold benefits of horizontal alliances, including, among other things, sharing of market information, building economies of scale for input supply, product assembly, transport, packaging and storage as well as capacity to negotiate and enter into supply agreements with off-takers, will enable farmers to improve their on-farm productivity as well as enhance their opportunities to access markets. The project will also provide training in organization, governance, bookkeeping, business development, procurement, and marketing.

29. **Training on the preparation of grant proposals.** The project will also provide technical assistance to farmer groups, agri-enterprises, community and private tree growers on preparation of business plans and quality, grant proposals for support under the performance grant and matching grant schemes. All grant applicants would be required to undertake such training, which will be included as criteria of grant screening. Training will also be provided to the district extension staff (training of trainers) to enable the continuation of such training beyond the life of the project. The formation and strengthening of the farmer groups will be facilitated either by a local business development service provider that has extensive experience with group dynamics and familiarity with the culture and ethos of Malawian farmers. This service provider will also provide tailored training and advice for the preparation of high quality, fundable grant proposals and business plans and business management to potential grantees. The service provider will continue to provide training/coaching/advice as needed to grant recipients to ensure sound implementation of the investment. This training will also be provided to extension staff (training of trainers) to enable them to continue such training beyond the life of the project.

30. **Formation and training of CMCs and VNRMCS.** The project will facilitate the creation and training of approximately **35 CMCs** at sub-catchment level in the target areas, in line with the Water Resources Act of 2013. The project will also finance refresher training and facilitate the re-demarcation of existing VNRMCS boundaries to match the hydrological boundaries of the micro-catchments. The project will also fund technical assistance to update sub-catchment management plans, update and digitize existing **305 VLAPs** in the original four catchments; and to delineate and prepare new plans for the scale-up watersheds in Balaka, Mangochi, and Machinga districts.



31. **Social marketing services.** Beyond advisory and capacity building, the project will finance the design and implementation of a social marketing campaign, based on cutting-edge behavior research, to influence farmer adoption of sustainable landscape practices. Behavior change communication is fundamental to the successful enabling of restoration at scale. Real and lasting change in land-use practices that contribute to degradation will depend on reaching millions of resource users across the forest and agricultural landscapes of Malawi with key messages and information that prompts behavior change. The campaign will be designed to influence attitudes towards SLM practices, create social pressure to change unsustainable land-use practices, reduce information barriers and promote the project's interventions that are designed to facilitate the adoption of SLM practices. The campaign will make use of different communication channels, including field days, farm radio/TV programs, cell-phones, and other technologies. While the campaign will primarily target the Shire River Basin, it will be designed with a national character, with some messages aimed at audiences outside the basin.

***Sub-component 1.4 – Support to Land Registration (US\$6 million)***

32. The project will support land registration processes in the target catchments to provide security of tenure for approximately **16,000** farming households, per the provisions of the Customary Land Act 2016. Evidence from large scale landscape restoration projects elsewhere (e.g., Ethiopia) shows that security of tenure is a critical motivating factor for household adoption of sustainable landscape management practices. The project will support the process of demarcation, adjudication and registration of approximately **20,000 ha** of land in the target catchments. The demand for land certification is likely to exceed the available financial support. For this reason, priority will be given to farmers receiving matching grants. The project will also give attention to securing land tenure for women and the youth. The project will finance operating costs to set up customary land committees and tribunals, training them to undertake their duties in accordance with the law, providing necessary equipment and materials to support the process. The project will complement other operations in the World Bank Malawi portfolio that are supporting rural land administration activities (e.g., Agriculture Commercialization Project and Shire Valley Transformation Project) and follow the same approaches and procedures developed under these projects. The Department of Surveys (DoS) and the Land Reform Implementation Unit (LRIU) within the Ministry of Lands, Housing and Urban Development (MOLHUD) will coordinate land administration activities under this project and have committed to deploy land clerks to all project districts to support land administration activities, including adjudication, demarcation titling, and registration.

***Cost Estimates for Component 1***

33. A detailed breakdown of costs for Component 1 is provided in Table 1.2 below.

**Table 1.2:** Breakdown of Costs for Component 1

Activities	Cost estimate in US\$ million								
	Grants		Goods	Works	CS	NCS	T/W	OC	Total
	Fixed	Variable (CECF Transfers)							
Performance-based grants to CMCs and VNRMCS	20.5	6.0							26.5
Performance-based grants to private tree growers	3.0								3.0
Performance-based grants to community tree grower groups	3.0								3.0
Matching grants to farmer groups	5.0								5.0
Matching grants to agri-enterprises	3.0								3.0
Advisory and training on SLM, CSA practices and silvicultural techniques							1.0	0.5	1.5
Formation and training of farmer groups							0.8		0.8
Formation and training of CMCs and VNRMCS							1.0		1.0
Preparation or update of catchment management plans					1.2			0.3	1.5
Social marketing campaign			0.2		1.0	0.5			1.7
Participatory land-use planning, land demarcation, adjudication & registration			1.0			5.0			6.0
<b>Total</b>	<b>34.5</b>	<b>6.0</b>	<b>1.2</b>	<b>0.0</b>	<b>2.2</b>	<b>5.5</b>	<b>2.8</b>	<b>0.8</b>	<b>53.0</b>

CS- Consulting Services; NCS - Non-Consulting Services; T/W - Training and Workshops; OC- Operating Costs; CECF – Community Environmental Conservation Fund

## Component 2 – Improving Watershed Services (US\$82 million equivalent)

34. This component aims to maximize the benefits people and communities obtain from improved watersheds as a basis for developing institutional and financing mechanisms that are needed to sustain restoration investments beyond the project period. The project will invest in improving watershed services – i.e., the benefits people obtain from ecosystems in a watershed. Benefits can be direct, such as provisioning services (i.e., food, water, forest products) or regulating services (i.e., control of floods, erosion regulation, and water purification, or indirect, through supporting services for the functioning of ecosystem processes (i.e., nutrient cycling; soil creation; and photosynthesis). Ecosystems also provide people with non-material benefits such as aesthetic pleasure, recreational opportunities, and spiritual and cultural sustenance. The ecosystems that provide watershed services form part of the infrastructure needed for water security. Thus, it is imperative for GoM to invest in the maintenance of watershed services, just as they invest in the maintenance of other types of infrastructure. The project will focus primarily on provisioning services and regulating services, as the other services (e.g., supporting services) are difficult to measure and quantify. The project will also support improvements in the provision of non-material benefits (such as cultural, recreation and amenity services) given that Malawi's most iconic national parks and wildlife reserves are in the Shire basin.



35. To improve watershed services, the project will invest in (i) strengthening the key watershed institutions that charged with the responsibility of protecting Malawi's watersheds; (ii) piloting a market-based mechanism to complement the institutional capacity interventions and to provide an opportunity to crowd-in private financing for watershed services where a market for such services exist; and (iii) a package of enabling infrastructure and climate information services to maximize the livelihood benefits from improved watersheds, and to enhance the climate resilience of both the farming community and the watershed. Details of activities to be financed under this component are described below.

***Sub-component 2.1: Performance-Based Grants to Selected Watershed Management Institutions (US\$19.3 million equivalent)***

36. The project will provide performance-based grants to selected watershed management institutions to finance institutional development activities aimed at achieving improvements in watershed services through sustainable management of water resources, land, forests and protected areas (national parks, sanctuaries and wildlife reserves). The grants will be linked to the achievement of a minimum set of indicators under a performance agreement signed between each institution and MoIWD. The grants will be provided to three institutions that play a critical role in watershed management<sup>40</sup> – i.e., NWRA; DoF; DNPW; and the seven DCs located within the hydrological boundaries of the targeted watersheds<sup>41</sup>. These institutions will utilize the grants to finance capacity building, operating costs, goods, equipment and logistical support, and any other assets and tools they need to play an effective role in the management of Malawi's critical watersheds in line with their respective mandates. For those institutions with an existing revenue stream (i.e., NWRA, DoF, and DNPW), the grant will also contribute to financing, on a declining basis, the gap between the cost of watershed management activities and the revenues generated from watershed services.

37. **Institutional challenges in watershed management.** Current efforts to address land degradation in watersheds are hampered by three interrelated institutional barriers: (i) limited funding for land stewardship programs in government budgets, which constrains the functioning of watershed management institutions at national, district and local levels; (ii) limited capacity to generate revenue from watershed services, either due to lack of a willing buyer for such services or inability to convert certain watershed services (e.g., provisioning and cultural and amenity services) into a sustainable revenue stream; and (iii) human resource capacity constraints at the national, district and local levels, with some of the critical institutions, not yet fully operationalized.

38. At the national level, the NWRA is the central agency charged with the responsibility for regulating and managing Malawi's water resources, including the management and protection of watersheds. NWRA was established under the Water Resources Act of 2013. However, to date, the authority is not yet operational. The Board of Directors was only appointed a year ago, and the executive management team is not yet in place. NWRA's primary revenue stream is the water abstraction fees, although the authority also receives funds from the Government. For the protection of catchments, NWRA is mandated under the Water Resources Act of 2013 to establish CMCs to spearhead water resources conservation activities at the catchment level. The authority has already launched a program to establish CMCs, starting with sub-catchments within the Shire River Basin. The Act further requires NWRA to transfer at least 20 percent of its annual water abstraction revenue to CMCs to support watershed protection activities. However, the authority is still in its infancy and it will take time to

<sup>40</sup> Other relevant watershed institutions may be eligible to participate in the grant scheme, subject to meeting the eligibility criteria outlined in the PIM and availability of funds

<sup>41</sup> Districts located within the hydrological boundaries of the targeted watersheds –i.e. Blantyre, Neno, Ntcheu, Balaka, Machinga, Zomba and Mangochi



develop the internal structure, capabilities, business processes, and tools needed to manage Malawi's water resources and watersheds effectively.

39. DoF and DNPW, on the other hand, are departments within MoNRM and MoETW respectively, charged with the responsibility to ensure sustainable development, conservation, and management of forestry and wildlife resources in protected areas. These agencies are particularly important for the Shire River Basin, given that protected areas comprise a large proportion of the upper part of the basin's landscape. While policies and strategies to promote sustainable provision of forest goods and services, as well as alternative sources of energy, are in place<sup>42</sup>, local enforcement of existing forest laws is weak. The Forestry Act of 1997 instituted the VNRCMs to take responsibility for sustainable forest management, the protection of water catchments and fragile areas, soil and water conservation, and restoration of degraded lands. Village Level Action Plans (VLAP) have been prepared in some districts of the Shire Basin. However, implementation is often stalled by capacity constraints and lack of funding. Village by-laws on natural resource management exist in some cases but are often outdated and not enforced by local leaders.

40. DoF manages a Forest Development and Management Fund (FDMF) established under the Forestry Act of 1997 to finance conservation, augmentation, and management of forest resources and forest lands in Malawi. The primary revenue sources for FDMF include log sales, concession fees, sale of firewood, license fees, and royalties on forestry produce. Fund revenues have increased from about US\$1.2 million in 2015 to US\$1.4 million in 2019, and there is potential to further grow the fund through more concessions for plantation forestry. Similarly, DNPW manages a National Parks and Wildlife Fund (NPWF) established under the National Parks and Wildlife Act 2017 to finance development, promotion, management and administration of national parks and protected areas. The primary revenue sources for NPWF are concession fees and park entrance fees. NPWF collected about US\$0.3million in 2018 and this is expected to double within the next three years. Both funds have the potential to contribute significantly to the resource requirements for landscape restoration. However, there is a need to strengthen the financial management of both funds in terms of planning and budgeting for the funds, accounting and reporting, and strengthening internal controls.

41. At the district level, human and financial resource constraints facing the public extension service are a significant impediment to the widespread adoption of SLM technologies. The extension service at the district-level is organized into Extension Planning Areas (EPA) overseen by the District Agriculture Development Offices (DADOs). Each EPA is further subdivided into smaller units, usually comprising of few villages, called Sections. These are supposed to be managed by one Agricultural Extension Development Officer (AEDO) but understaffing is common. Table 1.3 below presents staffing levels at selected districts in the Shire River Basin. In most districts, AEDOs manage two or more sections making it very difficult to reach all farming communities. Due to this problem, it is not unusual to find communities that have never seen their AEDO. Forest advisory services play an essential role in guarding the sustainable use, management, and the protection of local forests. They advise on nurseries and fire breaks. The staffing situation is similar if not worse than that for the agriculture advisory services. Forestry Assistants should be present at each EPA, but this is seldom achieved due to budget constraints.

<sup>42</sup> National Charcoal Strategy 2017-2027, National Forest Policy (2016), National Forest Landscape Restoration Policy (2017), National Climate Change Policy (2015)

**Table 1.3: Current Staffing Levels of Extension Services in Selected Districts**

District	No of EPAs	Number of Sections	Number of AEDOs	Sections left vacant
Balaka	6	83	44	39 (47%)
Blantyre	5	83	63	20 (24%)
Mangochi	11	193	89	104 (53%)
Zomba	9	150	83	67 (45%)

Source: UNIQUE (2018)

42. **Rationale and structure of the performance-based grants.** A performance-based grant scheme is proposed to (i) overcome bureaucratic inertia at the national and district level and spur action on specific long-standing institutional issues (e.g., delayed operationalization of key institutions); (ii) help translate the landscape restoration investments under Component 1 into actual watershed services by strengthening the institutions that would continue to implement restoration work beyond the project; (iii) improve selected watershed services and enable those institutions with an existing revenue stream to gradually recover a higher proportion of the cost of watershed management from revenues generated from watershed services; and (iv) build adaptive capacity of the institutions by diversifying their revenue sources and reducing dependence on constrained government budgets.

43. The grant is structured differently depending on whether the participating institution has an existing watershed service revenue stream or not. For those institutions without a revenue stream (e.g., Districts Councils), the project will provide (i) a fixed grant during the first two years of the project linked to achievement of a pre-agreed minimum score on the performance scorecard, as determined by the Annual Performance Assessment (APA); and (ii) a variable grant from the third year onwards proportional to each DC's performance score, as determined by the APA. The total grant to the DCs has been sized at about 10 percent of the average annual Other Recurring Transactions expenditure in the district<sup>43</sup>. Half of this will be fixed, and the other half will be a variable grant. In terms of allocation, the fixed grant portion will be allocated equally among all the seven DCs, while the variable grant will be allocated to DCs in proportion to each DC's performance score.

44. Similarly, for those institutions with an existing revenue stream (NWRA, DoF and DNPW), the grant will have two parts: (i) a fixed part linked to achievement of a minimum performance score on the APA; and (ii) a variable part linked to actual revenues collected by each entity from watershed services, either from provisioning services or revenues from productive use of landscape resources (including water), cultural and amenity services (in case of national parks), regulating services (where a market for such services exists), and punitive revenues (from enforcement of fines and penalties) or a combination of the these. The fixed grant will be provided only during the first two years of the project and will not be available after that. This approach is meant to provide a strong incentive to act fast on critical institutional bottlenecks that are holding back progress in the provision of watershed services. The fixed grant amount for each entity has been determined using a simple rule of thumb – i.e., 50 percent of the total projected entity costs in each of the first two years or the estimated cost of the start-up equipment and other assets required by the entity in each of the first two years, whichever is higher.

45. The variable part of the grant will be based on (i) analysis of the costs that each entity incurs in delivering on its mandate; (ii) the potential for revenue generation from watershed services; and (iii) existing or future government transfers to the entity. The variable grant will be provided to each entity based on verified watershed

<sup>43</sup> Other Recurrent Transactions refers to the ongoing costs of governmental operations, excluding those in personnel emoluments. It is often referred to as ORT.



service revenues collected, provided the entity maintains a pre-agreed minimum performance score on the APA. The variable grant amount will be based on agreed multiples (hereafter referred to as 'Annual Grant Multiplier or AGM') of verified watershed service revenues collected. The performance agreement will specify AGMs for each year within the project period. Each entity will only be eligible for a maximum variable grant amount in any given year regardless of the amount of revenues collected. In sizing the variable grant, we have assumed a government contribution equivalent to the envisaged cost-recovery gap in the year after the project closes or the existing (actual) government funding to the entity, whichever is higher. This amount is assumed to remain approximately constant (in real terms) throughout the life of the project. Gradual increases in watershed service revenues will enable the entities to cover an increasing portion of their costs through these revenues, thereby reducing their reliance on government budgets. Table 1.4 shows the grant estimates for the three agencies (NWRA, DoF, and DNPW). These estimates will be further refined prior to the signing of the performance agreements with each entity.

**Table 1.4:** Estimated Grant Amounts for NWRA, DoF, and DNPW

	Parameter	Y1	Y2	Y3	Y4	Y5	Y6
NWRA	Cost recovery from revenues (%)	8%	6%	14%	32%	54%	81%
	GoM contribution (%)	16%	7%	11%	14%	13%	13%
	Annual Grant Multiplier	0.7	6.4	5.3	1.7	0.6	0.1
	<b>Cost of Services (US\$ millions)</b>	<b>1.63</b>	<b>3.82</b>	<b>2.88</b>	<b>2.26</b>	<b>2.27</b>	<b>2.35</b>
	GoM Contribution	0.26	0.29	0.31	0.30	0.30	0.30
	Verified Watershed Service Revenues (R)	0.14	0.22	0.41	0.71	1.23	1.90
	Fixed Grant (A)	1.14	1.91				
	Variable Grant (B)	0.09	1.41	2.16	1.25	0.75	0.16
	<b>Total Grant (A+B)</b>	<b>1.23</b>	<b>3.32</b>	<b>2.16</b>	<b>1.25</b>	<b>0.75</b>	<b>0.16</b>
	<b>Cumulative Grant Amount (US\$ millions)</b>	<b>1.23</b>	<b>4.55</b>	<b>6.71</b>	<b>7.95</b>	<b>8.70</b>	<b>8.85</b>
DoF	Cost recovery from revenues (%)	47%	33%	51%	54%	52%	54%
	GoM contribution (%)	11%	9%	15%	17%	18%	21%
	Annual Grant Multiplier	0.2	0.0	0.7	0.5	0.6	0.48
	<b>Cost of Services (US\$ Millions)</b>	<b>2.05</b>	<b>2.68</b>	<b>1.82</b>	<b>1.75</b>	<b>1.84</b>	<b>1.70</b>
	GoM Contribution	0.22	0.24	0.27	0.29	0.32	0.35
	Verified Watershed Service Revenues (R)	0.97	0.88	0.92	0.95	0.96	0.91
	Fixed Grant (A)	0.68	1.73				
	Variable Grant (B)	0.18	-	0.64	0.51	0.56	0.43
	<b>Total Grant (A+B)</b>	<b>0.86</b>	<b>1.73</b>	<b>0.64</b>	<b>0.51</b>	<b>0.56</b>	<b>0.43</b>
	<b>Cumulative Grant Amount (US\$ millions)</b>	<b>0.86</b>	<b>2.59</b>	<b>3.22</b>	<b>3.74</b>	<b>4.29</b>	<b>4.73</b>
DNPW	Cost recovery from revenues (%)	7%	5%	8%	25%	30%	34%
	GoM contribution (%)	25%	15%	26%	73%	79%	86%
	Annual Grant Multiplier	1.9	1.0	8.4	0.1	0.0	0.0
	<b>Cost of Services US\$ millions)</b>	<b>1.22</b>	<b>2.32</b>	<b>1.51</b>	<b>0.59</b>	<b>0.60</b>	<b>0.60</b>
	GoM Contribution	0.30	0.34	0.39	0.43	0.47	0.52
	Verified Watershed Service Revenues (R)	0.09	0.11	0.12	0.15	0.18	0.20
	Fixed Grant (A)	0.67	1.76				
	Variable Grant (B)	0.16	0.11	1.01	0.01	-	-
	<b>Total Grant (A+B)</b>	<b>0.83</b>	<b>1.87</b>	<b>1.01</b>	<b>0.01</b>	<b>-</b>	<b>-</b>
	<b>Cumulative Grant Amount (US\$ millions)</b>	<b>0.83</b>	<b>2.69</b>	<b>3.70</b>	<b>3.71</b>	<b>3.71</b>	<b>3.71</b>



46. **Performance scorecard.** Central to the performance-based grant scheme is a performance scorecard that will be developed and agreed with each participating institution. The scorecard consists of two categories of indicators: (i) institutional capacity prerequisites necessary for each entity to deliver on its mandate; and (ii) performance measures that represent the result of the application and use of that capacity. Tables 1.5-1.8 show the proposed performance scorecard for each entity. The performance scorecard is subject to change during project implementation in agreement with the World Bank, and the PIM will contain the final scorecards and targets agreed between each entity and MoIWD, as well as the verification procedures.

**Table 1.5:** Districts Performance Scorecard

<b>Indicator</b>	<b>Weight (Year 1-2)</b>	<b>Weight (Year 3-6)</b>
<b>Institutional prerequisites</b>	<b>100%</b>	<b>30%</b>
Annual capacity building plan (fully costed) to strengthen extension services – approved by council resolution with budget allocation	25%	10%
Signed MoU/agreement with atleast one CMC to provide extension support	25%	0%
Maintain a separate bank account for all project-related expenditure	25%	10%
Annual progress report on project activities (including financial reporting)	25%	10%
Improved financial management (as defined in the PIM)		
<b>Performance</b>	<b>0%</b>	<b>70%</b>
Maintain at least 70 percent of required extension staff in target catchments	0%	25%
% proportion of annual agriculture/natural resources management spending at the district level that goes to extension services (scalable)	0%	25%
% of project beneficiaries are satisfied with the extension services provided by the district (scalable)	0%	20%
<b>Total score (institutional and performance)</b>	<b>100%</b>	<b>100%</b>
<b>Conditions to access grants</b>	Fixed grant on the achievement of minimum total score of 100%	Variable grant proportional to the achieved total score

**Table 1.5:** NWRA Performance Scorecard

<b>Indicator</b>	<b>Weight (Year 1-2)</b>	<b>Weight (Year 3-6)</b>
<b>Institutional prerequisites</b>	<b>80%</b>	<b>20%</b>
Executive Director appointed competitively	30%	0%
Strategic plan, policies, and procedures approved by the board	10%	0%
Organizational structure endorsed by the Department of Statutory Corporations, Office of the President and Cabinet	10%	0%
Operational plan approved by the board	10%	0%
Existing water resources information systems transferred from DWR to NWRA	10%	0
Improved financial management (as defined in the PIM)	10%	20%
<b>Performance</b>	<b>20%</b>	<b>80%</b>
Number of CMCs established and receiving funding from NWRA (scalable)	0%	20%
Functionality of the hydrological monitoring network (as defined in PIM)	10%	20%
% of sampled water users who are satisfied with NWRA services (scalable)	0%	20%
% of NWRA's operating costs covered from water abstraction fees and other charges (scalable)	10%	20%
<b>Total score (institutional and performance)</b>	<b>100%</b>	<b>100%</b>
<b>Condition to access grants</b>	Minimum total score of 60%	

**Table 1.7:** DoF Performance Scorecard

<b>Indicator</b>	<b>Weight (Year 1-2)</b>	<b>Weight (Year 3-6)</b>
<b>Institutional prerequisites</b>	<b>80%</b>	<b>20%</b>
Establish forest co-management in Phirilongwe and Namizium forest reserves	20%	0%
Issue expressions of interest and sign at least 15,000 ha of forest plantation contracts with the private sector or community groups	20%	0%
Establish forest seed bank for provision of certified seeds	20%	0%
Improved financial management of the FDMF (as defined in the PIM)	20%	20%
<b>Performance</b>	<b>20%</b>	<b>80%</b>
Number of forest reserves under co-management (scalable)	5%	20%
Area of plantation forests established (i.e., received at least one payment under performance-based grant scheme for plantation forestry) (scalable)	5%	20%
% of project beneficiaries who are satisfied with forestry extension services provided by DoF (scalable)	5%	20%
% of forest management costs covered from revenues collected in FDMF (scalable)	5%	20%
<b>Total score (institutional and performance)</b>	<b>100%</b>	<b>100%</b>
<b>Condition to access grants</b>	Minimum total score of 60%	

**Table 1.8:** DNPW Performance Scorecard

<b>Indicator</b>	<b>Weight (Year 1-2)</b>	<b>Weight (Year 3-6)</b>
<b>Institutional prerequisites</b>	<b>80%</b>	<b>20%</b>
Prepare and adopt a protected areas concession management strategy	30%	0%
Prepare and publish a prospectus for leveraging private sector investments in Malawi's protected areas (national parks, sanctuaries and wildlife reserves)	20%	0%
Issue expressions of interest for concessions for selected national parks sanctuaries and wildlife reserves	10%	0%
Improved financial management of the NPWF (as defined in the PIM)	20%	20%
<b>Performance</b>	<b>20%</b>	<b>80%</b>
Concession agreements signed (scalable)	0%	20%
% increase in visitor numbers in national parks	10%	30%
% of parks management costs covered from revenues collected in NPWF	10%	30%
<b>Total score (institutional and performance)</b>	<b>100%</b>	<b>100%</b>
<b>Condition to access grants</b>	Minimum total score of 60%	

47. **Verification mechanism.** All the performance grants will be subject to independent verification by a third party (consultant engaged by MoWD) before the transfer of grants. Detailed verification procedures will be outlined in the PIM. An annual performance assessment (APA) will be conducted for target districts to determine the performance score for each district and the grant amount earned. For the revenue-generating entities (NWRA, DoF, and DNPW), the APA will follow two steps. First, a performance verification will be done to confirm the performance score on each entity's performance scorecard. Then, a financial verification will be done to verify the amount of watershed service revenues collected (the basis for calculation of the variable portion of the grant). If performance verification confirms achievement of the minimum performance score, financial verification will determine the grant to be provided to the entity – which includes a fixed portion (applicable to year 1 and 2 only) and a variable part (applicable throughout the project period) based on an agreed multiple of



the verified watershed service revenues in the year. Each entity will only be permitted to fail performance verification on only three occasions. In the unlikely event that they fail more than three times, their participation in the grant scheme will be reconsidered.

***Sub-component 2.2: Piloting Market-Based Mechanism for the Provision of Selected Watershed Services (US\$5 million, equivalent)***

48. This component will finance technical assistance and the initial capital required to establish a market-based mechanism for the provision and maintenance of selected watershed services in the Shire River Basin. The mechanism will involve using payments or rewards to individual farming households to encourage certain land-use practices that result in a specific watershed service that is of value to downstream water users. Regulating services of the watershed, particularly the reduction in sedimentation, offer the most potential for developing a market-based mechanism to complement the institutional capacity interventions under sub-component 2.1 above. Recent studies<sup>44</sup> have highlighted the potential for such a scheme in the Shire River Basin, targeting a number of downstream water users, including Malawi's Electricity Generation Company (EGENCO), water utilities operating in the Shire River basin – i.e., Blantyre Water Board (BWB) and Southern Region Water Board (SRWB) – who are incurring high operating costs due to the high level of sediments in the Shire River.

49. Building on these studies, the project will finance (i) technical assistance and related goods, works and services for the development of a Payment for Watershed Services (PWS) scheme for sediment reduction in selected micro-catchments upstream of the major hydropower and water supply intake installations; and (ii) PWS transfers to eligible beneficiary farmers upon achievement of sediment reduction targets. The project will take on the role of a “stand-in buyer” to pay individual farming households based on PWS contracts for sediment reduction. The aim is to provide a demonstration to the potential buyers (EGENCO, BWB, and SRWB) that payments to the farmers can deliver reductions in sediments. Beyond the immediate financial benefits to the buyers, reduced sedimentation will also improve climate change adaptation in the sense that reduced sediments will lead to improved water quality and availability and increase resilience to the impact of flash floods in the form of landslides or similar potentially life-threatening events.

50. **Rationale for piloting a market-based mechanism.** A market-based mechanism is proposed to complement the institutional capacity interventions under sub-component 2.1 and provide an opportunity to crowd-in private financing for watershed services where a market for such services exist. One of the challenges for watershed management in Malawi and elsewhere is the lack of consistent, long-term financing beyond the typical short-term project-based financing models. A PWS scheme can shift that dynamic because, in such a scheme, payments provided by downstream water users can finance watershed services for a much more extended period. In the case of the Shire River Basin, regulating services (such as sediment reduction, water quality) presents the best opportunity for a market-based mechanism given the high levels of sedimentation in the Shire River and its tributaries, and the associated costs incurred by both the energy and water utilities. Preliminary estimates indicate that EGENCO, BWB, and SRWB together lose about US\$10 million annually due to high levels of sediments. A feasibility study<sup>45</sup> carried out in 2017 highlighted the potential for developing a PWS scheme focusing on sediment reduction by paying farmers to implement riparian buffers. These buffers are small pockets of vegetation that line river and stream banks, with the ability to improve water quality by preventing

<sup>44</sup> World Conservation Society (2017). Payments for Ecosystem Services (PES) - Scheme for Improving Erosion/Sedimentation of the Shire River Basin. Unpublished report for the Millennium Challenge Account- Malawi.

<sup>45</sup> World Conservation Society (2017). Payments for Ecosystem Services (PES) - Scheme for Improving Erosion/Sedimentation of the Shire River Basin. Unpublished report for the Millennium Challenge Account- Malawi.



sediment from entering a stream. Projects that provide incentives to farmers to implement riparian buffers in the Shire have been done before by various NGOs and their funding partners. However, these projects are done typically at a small-scale and on a fixed time basis, and there is no rigorous monitoring and verification of their impacts on sediment yield. The proposed project will finance a pilot PWS scheme to demonstrate the impact of interventions such as riparian buffers on sediment reduction, and thus provide the evidence needed to inform buyer decisions for maintaining these watershed services beyond the project.

***Sub-component 2.3: Enabling Infrastructure and Climate Information Services (US\$58.5 million, equivalent)***

51. This sub-component will finance a package of enabling infrastructure and climate information services to maximize the livelihood benefits from improved watersheds and to enhance the resilience of both the farming community and the watershed to climate-change induced droughts and floods. Investments will include:(i) **multi-purpose water infrastructure** to increase access to water for multi-purpose use, while at the same time protecting people from floods; (ii) **last-mile infrastructure**, including small to medium scale irrigation systems and rural feeder roads, bridges and market sheds, to support agricultural productivity and market access and enhance the chances of success for the small-holder farmer groups supported under sub-component 1.2; and (iii) development of **climate information services** to enable climate-informed decision-making by different watershed users (including farmers and agri-enterprises, energy and water utilities, dam operators, insurance companies, etc).

52. **Multipurpose water infrastructure.** The project will finance infrastructure for harvesting, storing, and delivering water for people, livestock, and agriculture in the targeted watersheds, as well as flood control. The objective is to diversify water sources in each watershed and increase the amount of water available for productive use, mitigate against the risk of droughts, while at the same time protecting people from the destructive impacts of water (floods). The menu of water infrastructure investments will include small to medium dams, rainwater harvesting structures (including sand and sub-surface dams, semi-circular bunds and soil bunds), and boreholes for groundwater extraction. The project is expected to finance approximately **10 small dams, 20 rainwater harvesting structures, and eight solar-powered high yielding boreholes** and associated conveyance infrastructure to increase access to water for multi-purpose use for about **42,000 people**. However, the exact scope of investments will be identified based on participatory plans and detailed micro-catchment hydrology assessments and groundwater investigations. A framework for identification, selection and appraisal of multipurpose water infrastructure has been developed (see Annex 4). Based on this framework, a preliminary list of eight small dams have been screened for potential financing under the project (see Table 1.9).

**Table 1.9:** Indicative List of Small Dams

	<b>Site</b>	<b>District</b>	<b>River/catchment</b>	<b>Storage capacity (m<sup>3</sup>)</b>	<b>Height m</b>	<b>Type of Structure</b>
1	Mpili	Machinga	Mpili	730,000	7.5	Zoned Earth fill embankment
2	Mwaye	Balaka	Mwaye	220,000	6.5	Zoned earth-fill embankment
3	Linjizi	Blantyre	Linjizi	188,000	6.5	Zoned earth fill embankment
4	Linengwe	Ntcheu	Linengwe	120,000	7.5	Zoned earth-fill embankment
5	Lilole	Mangochi	Lilole	984,000	6.5	Zoned earth fill embankment
6	Phalombe	Zomba	Phalombe	100,000	4.5	Rubble masonry concrete
7	Zumulu	Machinga	Zumulu	300,000	6.5	Zoned earth fill embankment
8	Thondwe	Zomba	Thondwe	320,000	9.25	Zoned earth-fill embankment



53. The final set small dams, however, will be defined during project implementation based on detailed assessments (including water availability assessments to ensure that increased water abstraction will not exacerbate the water stress in the targeted catchment). The component will also finance technical assistance for the design and construction supervision of these infrastructure investments, as well as capacity building for operation and maintenance (including establishing and training of water user associations).

54. **Last-mile infrastructure.** The project will finance last-mile infrastructure to support small-holder producer groups to improve productivity, add value to their products and gain access to markets. Investments will include (i) small-medium scale irrigation systems to accelerate diversification, intensification, and commercialization of agricultural production; (ii) rural feeder roads, bridges, and market centers to improve access to markets; and (iii) clean water for value addition, where required. These investments tend to have a prohibitively high cost for producer groups, but they yield benefits that extend beyond the producer groups supported by the project to surrounding communities.

55. The project is expected to finance at least 10 small to medium scale irrigation systems to provide irrigation services on approximately 2,400 ha of cropland and benefiting about 5,000 farmers; construction or rehabilitation of 10 market shades in strategic locations; construction or repair of roughly 100 km of rural feeder roads to improve rural access and for water harvesting (roads for water); construction or rehabilitation of about 10 rural bridges or river crossings. A framework for identification, selection, and appraisal of last-mile infrastructure investments has been developed (see Annex 4). Based on this framework, a preliminary list of nine small and medium irrigation schemes have been screened for potential financing under the project (see Table 1.10). Most of these schemes were prepared under SRBMP. The final set schemes, however, will be defined during project implementation based on detailed assessments. The component will also finance technical assistance for the design and construction supervision of these last-mile infrastructure investments, as well as capacity building for operation and maintenance (including establishing and training of water user associations, in the case of irrigation schemes).

**Table 1.10:** List of Indicative Irrigation Schemes

Scheme Name	Catchment	District	Area (ha)	Beneficiaries
<b>Upilewetu</b>	Chingale	Zomba	89	111
<b>Mpoya/ Mdere</b>	Chingale	Machinga	25	58
<b>Bilira</b>	Chingale	Zomba	7	30
<b>Mango</b>	Chingale	Zomba	115	30
<b>Chitseke</b>	Lisungwi	Ntcheu	32	100
<b>Fufule</b>	Lisungwi	Ntcheu	21	70
<b>Thava</b>	Lisungwi	Ntcheu	46	150
<b>Tsenjerani</b>	Wamkulumadzi	Neno	12	45
<b>Wamkulumadzi</b>	Wamkulumadzi	Neno	321	642

56. **Climate information services<sup>46</sup>.** The project will finance technical assistance and related goods, works and services to develop and market a suite of hydrological, weather and climate products and services to enable climate-informed decision-making by different users (including smallholder farmers and agri-enterprises, energy

<sup>46</sup> We use the term “climate information services” to refer to both hydrological (water-related) and meteorological (weather and climate-related) services. When weather or climate is used independently or together in the document, water is also implied.



and water utilities, dam operators, insurance companies, etc) using data from the existing ground-based observation network managed by both the Department of Climate Change and Meteorological Services (DCCMS) and NWRA, and supplemented as necessary with other global, satellite-based sources.

57. Future climate change scenarios suggest that Malawi will see increasing climatic variability, higher temperatures, more extended dry periods, and more erratic and intense rainfall events<sup>47</sup>. Changes to climate and weather patterns exacerbate the impacts of landscape degradation, making it harder to address the problem. More extreme flood events will cause greater soil erosion and land degradation. Hotter and drier periods will contribute to forest fire risks. Droughts will continue to negatively impact food production, causing food insecurity, and increased poverty. Increased poverty results in higher demand for agricultural land, thus exerting more pressure on the natural resources base. Improving climate information services is, therefore, key to building climate resilience across various productive sectors in a watershed and reducing stress on the natural resources base. However, Malawi remains unprepared to anticipate and respond to the effects of climate change.

58. While GoM has made some investments in revamping the country's most critical hydrological and meteorological observation network (especially within the Shire river basin)<sup>48</sup>, operation and maintenance of the network remain a challenge due to limited budgets. Moreover, both DCCMS and NWRA have limited technical capacity to convert hydro-meteorological data into useful, and potentially revenue-generating climate information products and services needed for building resilience. Both agencies, however, are committed to exploring the involvement of the private sector to support the transition up the climate services chain, from data collection to products and services, and there are opportunities to strengthen the ground observation network further to support product development.

59. The project will therefore finance three interrelated activities to enable both DCCMS and NWRA to move up the climate services chain. First, the project will fund technical assistance to assess the demand for tailored hydrological and climate products and services in Malawi; assess market-oriented opportunities for developing these products and services, including opportunities and modalities for a PPP; and provide transaction advisory services should a viable PPP model emerge from the assessment. Second, the project will finance technical assistance and related goods and works to support the installation and operation of Malawi's first weather radar station to support climate services. Finally, the project will provide innovation grants for the private sector to develop and market different hydrological and climate products targeting different user groups, one of which must be smallholder farmers in the target watersheds. The purpose of the grants is to defray part of the capital costs required to bring innovative product/service ideas to the market and to promote private sector participation in Malawi's climate services sector.

60. To operationalize the innovation grant mechanism, DCCMS and NWRA will issue a joint request for proposals (RFP) from private sector innovators and developers (local, regional and international) to develop tailored products and services as part of a public-private partnership with DCCMS/NWRA. Proposals will be selected based on transparent criteria to be outlined in the RFP. An independent panel will be constituted to assist DCCMS/NWRA in evaluating the proposals and business plans and provide advice during the subsequent product development process. Grants will be awarded for the best, game-changing and disruptive ideas that have the potential to become commercial successes. Proposals may be for a brand-new product or service or for

<sup>47</sup> Government of Malawi (2017). Strategic Program for Climate Resilience: Pilot Program on Climate Resilience (PPCR).

<sup>48</sup> A network of 100 hydromet monitoring stations (75 meteorological and 25 hydrological) across the basin has recently been revamped as part of SRBMP. Plus, modern hydromet equipment and associated software have been installed to enable access to hydromet data in near real time. More investments in network expansion are underway under M-CLIMES project implemented by UNDP)



taking an existing product or service to scale. Selected developers will sign contracts with DCCMS/NWRA which would include a development phase of no more than three years and a service delivery phase of three years or more. The contract will commit DCCMS/NWRA to provide free access to hydrological and meteorological data needed for the product or service to work. The contract will also specify a revenue-sharing mechanism between DCCMS/NWRA and the developer, should the product or service become a commercial success. The grant amount is capped at US\$250,000 per recipient, and this is expected to cover the development costs (including prototype and testing) and initial roll-out and marketing. The actual grant amount, however, will be determined through a competitive bidding process. Details of the transaction (including selection criteria, risk allocation mechanism, payment model, and other contractual terms) will be developed during project implementation, with the help of an experienced transaction advisor.

***Cost Estimates for Component 2***

61. A detailed breakdown of costs for Component 2 is provided in Table 1.11 below.

**Table 1.11:** Breakdown of Costs for Component 2

	Cost estimate in US\$ million									
	Grants	PWS Transfers	Goods	Works	CS	NCS	T/W	OC	RAP	Total
Performance-based grant to NWRA	8.9									8.9
Performance-based grant to DoF	4.7									4.7
Performance-based grant to DNPW	3.7									3.7
Performance-based grant to districts	2.0									2.0
PWS pilot		4.0	0.2		0.8					5.0
Construction of small dams				10.0	1.2			1.0		12.3
Construction of rainwater harvesting structures				5.0	0.5			0.5		6.0
Construction of solar-powered high yielding boreholes				7.0	0.5			0.5		8.0
Construction of irrigation schemes				18.0	1.5			1.0		20.7
Other last-mile infrastructure (rural feeder roads, bridges, market shades, potable water supply)				3.5	0.5					4.0
Weather radar			2.0							2.0
Hydrological, weather and climate products and services					1.0	4.0				5.0
<b>Total</b>	<b>19.3</b>	<b>4.0</b>	<b>2.2</b>	<b>43.5</b>	<b>6.0</b>	<b>4.0</b>	<b>0.0</b>	<b>0.0</b>	<b>3.0</b>	<b>82.0</b>

CS- Consulting Services; NCS - Non-Consulting Services; T/W - Training and Workshops; OC- Operating Costs; RAP- Resettlement Action Plan (compensation costs); PWS- Payments for Watershed Services

**Component 3 – Technical and Project Management Support (US\$25 million equivalent)**

62. This component aims to strengthen MoIWD's capacity to implement the proposed SoP in partnership with other line ministries, departments, and agencies, and to monitor and evaluate its development impact. Activities are organized in three sub-components as follows.

***Sub-component 3.1 - Preparation of Future Phases of the Project (US\$6 million)***

63. This sub-component will finance technical assistance to MoIWD to prepare the second phase of the project (SoP-2) targeting Linthipe, Bua, and Dwangwa river basins. Activities will include studies to identify and delineate priority (hotspot) catchments in the three river basins, the formation of CMCs, preparation of catchment management plans and micro-catchment plans, and carrying out feasibility studies and engineering designs for enabling infrastructure investments identified in the catchment management plans. The sub-component will also finance incremental operating costs associated with stakeholder consultations and consensus-building on the scope of the second phase. Further, to inform financial structuring of future phases of the project, this sub-component will finance studies on the efficient cost of achieving GoM's landscape restoration targets as laid out in the NFLRS and propose a credible long-term financing plan that considers not only the benefits of managing watersheds sustainably but also potential policy measures such as redirecting part of the existing agricultural subsidy programs to finance the NFLRS.

***Sub-component 3.2 – Biophysical and Ecological Monitoring and Impact Evaluation (US\$7 million)***

64. Large-scale land restoration requires sound and rigorous multi-level monitoring system for biophysical and ecological changes within the landscape. The monitoring is essential for several reasons. First, GoM needs to be able to track and report the progress of its SLM-related policies, strategies, and investment plans to enable policymakers to better coordinate restoration-related programs, and to meet requirements from funding institutions. Secondly, a sound monitoring, and evaluation system would allow GoM and investors to understand better what restoration options work where and why. This understanding is critical to building adaptive capacity, making more informed investment decisions, better planning and targeting, and to mobilize additional finance. Finally, enhanced biophysical monitoring is crucial to the success of the proposed PWS pilot.

65. This sub-component will, therefore, finance technical assistance and capacity building to develop and operationalize a GIS-based biophysical and ecological monitoring system and to carry out impact evaluations to inform future projects in the SoP. Specifically, the project will support (i) development of a framework for biophysical and ecological monitoring, together with associated ICT-based monitoring tools and geo-spatial information systems; (ii) collection of spatially-referenced baseline biophysical data such as soil erosion maps, sediment yields, soil fertility maps etc; (iii) purchase of modern ICT equipment and tools for data management, including integration with satellite and remote-sensed data systems; (iv) ecological zoning of agroforestry systems and preparation and update of agro-ecological zones; (v) preparation and update of national forest cover maps, land use and land cover maps; (vi) water quality and sediment monitoring in targeted watersheds; and (vii) capacity building of CMCs, VNRMCs, districts, relevant ministries, departments and agencies on biophysical and ecological monitoring of changes. The main output from this component is the development and operationalization of a GIS-based biophysical and ecological monitoring system. The development of the system will take advantage of the significant advance of digitalization (handling and visualizing big amounts of data). The system will integrate high resolution, project-level data with data systems supporting the compilation of the national inventories and registries. Cost-effective monitoring systems via approaches like remote sensing, aerial vehicles, and mobile-phones based reporting will be tested.

66. This sub-component will also finance several impact evaluations (IE) to build the evidence-base to inform future projects in the SoP. Four impact evaluations are planned to be conducted through a partnership between MoIWD and the Lilongwe University of Agriculture and Natural Resources (LUANAR). The first (IE1) will be an impact evaluation using randomized control trials to evaluate the effectiveness and impact of financial incentives on farmer decisions to adopt SLM practices. The second evaluation (IE2) will be a biophysical impact evaluation



examining the response of the environment to SLM interventions, considering parameters such as peak and base surface water flows, groundwater levels and recharge rates, sediment loads, and remotely sensed information on vegetation cover and soil moisture. The third evaluation (IE3) will investigate the productivity gains from adopting SLM and CSA. Lastly, a livelihood impact evaluation (IE4) will examine the impact of project interventions on livelihoods (household incomes) in the targeted watersheds.

67. The above interventions will also help strengthen the adaptive capacity of MoIWD (and other line ministries and departments) to climate change through improving preparedness and learning and through generating feedback with which to gain or create knowledge and strengthen relevant skills and capacities.

#### ***Sub-component 3.3 – Project Management Support and Incremental Operating Costs (US\$12 million)***

68. This sub-component will finance project management consultants to support the Multi-sectoral Technical Team (TT) in implementing the project, as well as incremental operating costs associated with the day-to-day management of the project and coordination with different sectoral agencies/departments at national, district and local levels. The nature and scope of project management support required have been determined based on a recent capacity assessment of the TT, as well as lessons from SRBMP. The project will finance full-time individual consultants to support the TT in the following areas: project management, financial management, procurement, monitoring and evaluation, and environmental and social standards implementation. This sub-component will also finance technical assistance to support the watershed institutions (NWRA, DoF, DNPW and DCs) in finalizing their institutional development plans, confirming the revenue and cost projections, negotiating the performance agreements with MoIWD; and in carrying out annual performance assessments.

#### ***Cost Estimates for Component 3***

69. A detailed breakdown of costs for Component 3 is provided in Table 1.12 below.

**Table 1.12:** Breakdown of costs for Component 3

	Cost estimate in US\$ million						
	Goods	Works	CS	NCS	T/W	OC	Total
Technical assistance for preparation of future phases of the project			5.5			0.5	<b>6.0</b>
Biophysical and ecological monitoring	0.5		3.7		0.8		<b>5.0</b>
Impact evaluations			2.0				<b>2.0</b>
Project management support consultants			2.8				<b>2.8</b>
Preparation of institutional development plans for key watershed institutions			0.3				<b>0.3</b>
Independent verification of performance for key watershed institutions			0.4				<b>0.4</b>
Incremental operating costs for TT						8.5	<b>8.5</b>
	<b>Total</b>	<b>0.5</b>	<b>0.0</b>	<b>14.7</b>	<b>0.0</b>	<b>0.8</b>	<b>9.0</b>
							<b>25.0</b>

CS- Consulting Services; NCS - Non-Consulting Services; T/W - Training and Workshops; OC- Operating Costs

**ANNEX 2: Implementation Arrangements and Support Plan**

**COUNTRY: Malawi**  
**Malawi Watershed Services Improvement Project**

**Institutional and Implementation Arrangements**

1. **The project will adopt the same implementation arrangements used for SRBMP.** MoIWD is the lead implementing ministry for the project. However, individual project components, sub-components and activities will be implemented through relevant departments, other ministries and local governments, as appropriate. MoIWD will sign a memorandum of understanding with each participating ministry or department or agency. The existing Multi-Sectoral Technical Team (TT) comprising staff from various ministries and departments, will be retained and strengthened to function as the Program Management Unit (PMU). A Program Coordinator, seconded from MoIWD, will lead the TT. Further, a Project Management Support (PMS) team will be recruited to support the TT on project management, financial management, procurement, monitoring and evaluation, and environmental and social safeguards implementation. The existing Program Steering Committee (PSC) and the Program Technical Committee (PTC) will also be retained to provide overall policy and technical guidance respectively. District Councils will continue to play a critical role in project implementation and will be incentivized through performance-based grants. Catchment Management Committees (CMCs) will be formed in line with the Water Resources Act 2013 to spearhead the implementation of landscape restoration activities, working with existing Village Natural Resources Management Committees (VNRMCs) at the micro-catchment level. Figure 2.1 provides a graphical illustration of the project implementation arrangements.

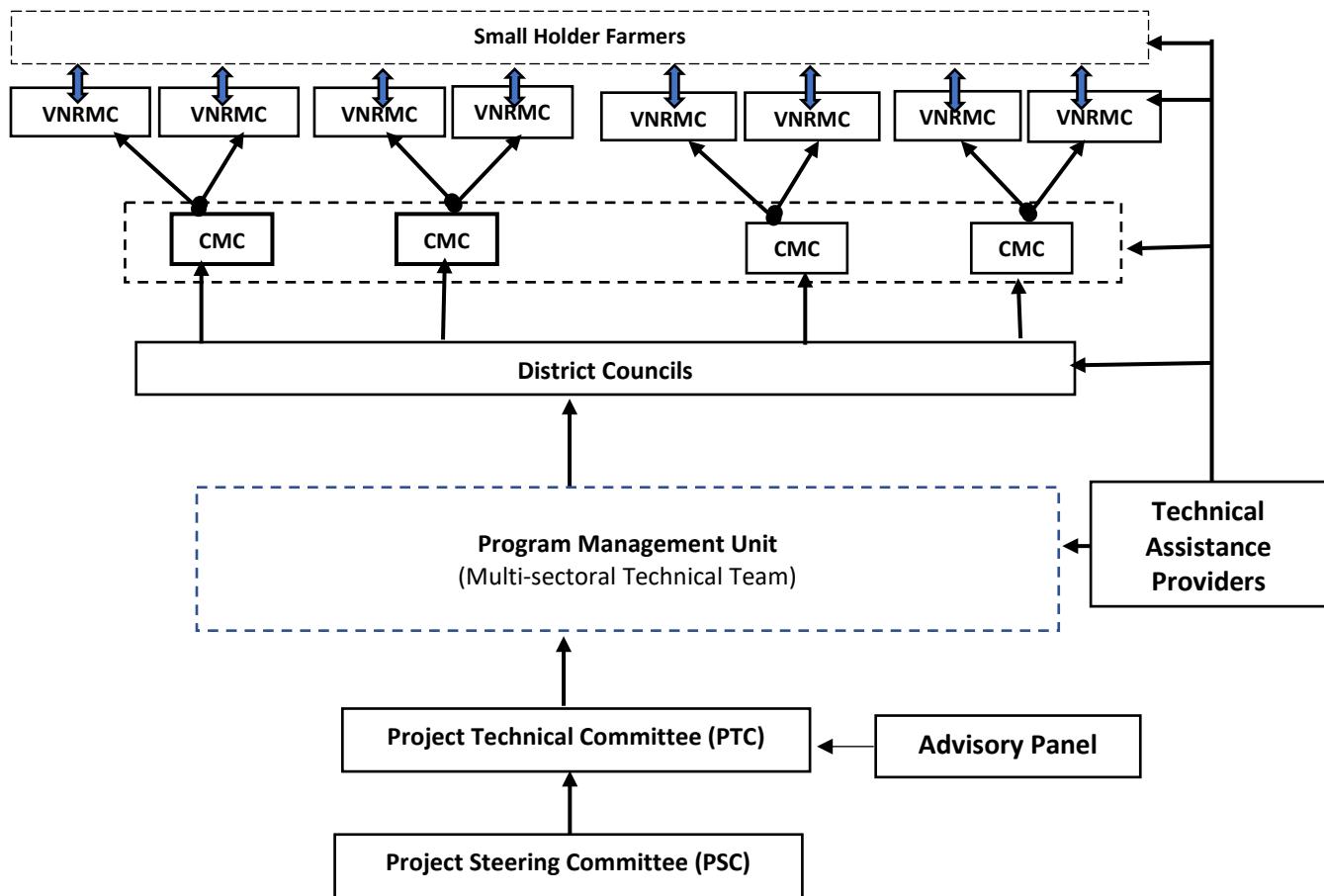
2. **The Project Steering Committee (PSC).** The PSC will provide strategic guidance, direction and oversight to the project. The PSC is chaired by the Principal Secretary (PS) of MoIWD and is composed of Principal Secretaries of MoIWD; the Ministry of Finance, Economic Planning, and Development (MoFEPD); the Ministry of Agriculture and Food Security (MoAFS); Ministry of Natural Resources and Mining (MoNRM); the Ministry of Energy (MoE); the Ministry of Environment, Tourism and Wildlife (MoETW); the Ministry of Housing, Lands and Urban Development (MoLHUD); Ministry of Local Government and Rural Development (MLGRD); the Ministry of Transport and Public Works (MTPW). Composition and terms of reference for the PSC will be further detailed in the Project Implementation Manual (PIM). The Program Coordinator will serve as Secretary of the PSC. The PSC would meet at least twice a year and is responsible for: inter-sectoral coordination and facilitation, annual programming of activities and approval of work plans and budgets, monitoring implementation and results (including audits), policy guidance and recommending corrective actions that may be necessary.

3. **Project Technical Committee (PTC).** The PTC will provide a multi-sector advisory and consultative platform to review technical submissions, synthesize information, and insight on project preparation and implementation issues. The Director of Water Resources, MoIWD, will chair the PTC. PTC members include Director-level representatives of the Departments of Water Resources (DWR); Irrigation (DoI); Land Resources and Conservation (DLRC); Agricultural Extension Services (DAES); Crop Development (DCD); Animal Health and Livestock Development (DAHLD); Forestry (DoF); National Parks and Wildlife (DNPW); Environmental Affairs (EAD); Surveys (DoS); Climate Change and Meteorological Services (DCCMS); Rural Development (DRD); and Local Government Services (DLGS). Membership would also include a representative from the Secretariat of the National Agriculture Investment Plan (NAIP), the Chief Executive Officers (CEOs) of the National Water Resources Authority (NWRA), Southern Region Water Board (SRWB), Central Region Water Board (CRWB), and Lilongwe Water Board (LWB). The Program Coordinator will serve as Secretary of the PTC. The PTC would meet

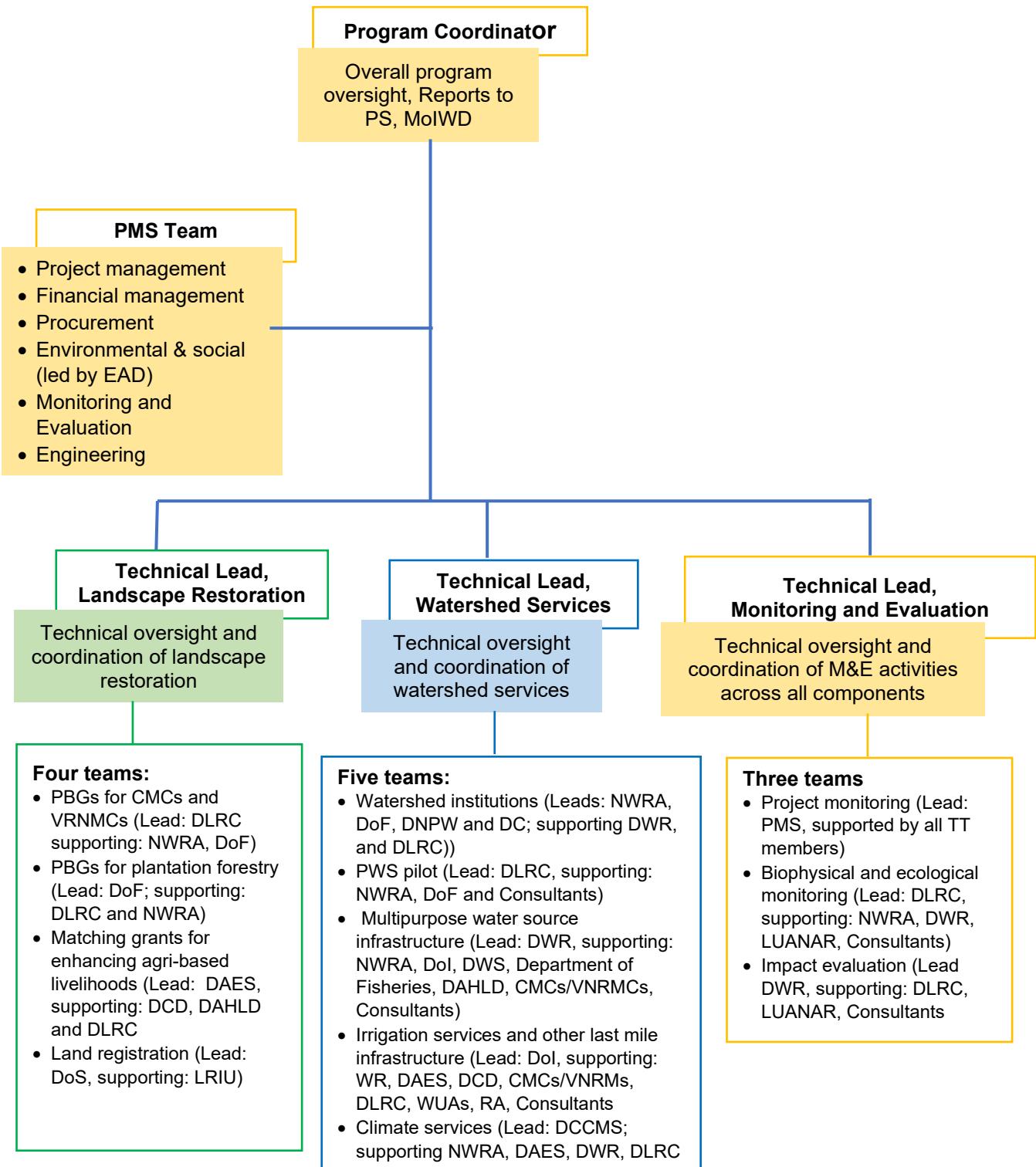


at least three times per year and be responsible for technical guidance and oversight of program activities (including reports and studies), review and synthesize suggestions and recommendations from studies and reports and submit these to the PSC for consideration and decision. The PTC will be supported by an independent Advisory Panel consisting of recognized experts in different fields relevant to the project. The Panel will also carry out independent reviews of grant applications under sub-component 1.1 (private sector and community grants for plantation forestry) and sub-component 1.2 (matching grants to farmer groups and agri-enterprises) and provide advice on biophysical and ecological monitoring and impact evaluation activities under sub-component 3.2.

**Figure 2.1:** Project Implementation Arrangements



4. **Program Management Unit (PMU).** The PMU is composed of a Multi-Sector Technical Team (TT) drawn from different ministries, departments, and agencies involved in the project. The TT will be responsible for the overall coordination and management of the project, including planning, procurement, financial management, implementation of E&S standards, and results monitoring and evaluation. The TT is a fully integrated project team that includes professional staff from the different government agencies involved in the project, as well as a Project Management Support (PMS) team consisting of both government staff and consultants recruited externally. The TT will be led by a Program Coordinator who would report directly to the PS, MoIWD. The structure of the PMU/TT is illustrated in Figure 2.2 below.

**Figure 2.2: PMU/TT structure**



5. The TT has been reconstituted with a new mandate to coordinate and manage this project and the subsequent projects in the series. TT members will be organized in three workstreams, each led by a Technical Lead - a senior government technical staff with relevant expertise and experience in the assigned workstream. The three workstreams are landscape restoration, watershed services and monitoring and evaluation. The Technical Leads will be responsible for day-to-day oversight and coordination of project activities under their workstream. Individual TT members will be expected to lead on components or sub-components under their respective departments or agencies. This delivery model was used under SRBMP and it proved successful in fostering inter-agency collaboration and building capacity for coordinated management of land and water resources. The World Bank team has carried out a capacity assessment of the reconstituted TT and noted that some of the critical skills (such as project management, financial management, procurement, safeguards, and M&E) that are required to deliver on a project of this scale and complexity are lacking in the current TT structure. To address these gaps, MoIWD has agreed to contract full-time individual consultants within nine months after project effectiveness to support the TT in the areas of project management, procurement, financial management, M&E and safeguards implementation. MoIWD has also agreed to engage other professional and support staff to facilitate the operations of the TT and ensure that other specialized tasks, beyond the ones identified above, are professionally executed by people with the necessary expertise.

6. **District Councils (DCs).** DCs in the project area will continue to play a critical role in project implementation and provide the interface between the TT and the participatory watershed governance structures at the community level. Technical Officers from the relevant departments at the district level (i.e., agriculture, land resources conservation, forestry, water, etc), as well as field extension staff, will coordinate the implementation of activities under Component 1 and 2 at the district level, under the oversight of the District Commissioner. DCs will also continue to provide extension support to CMCs, VNRMCs and farmers on SLM technologies. The main capacity gap at the district level is the human and financial resource constraint facing the public extension service. A combination of high staff vacancy rates and limited budgets allocation have had a crippling effect on extension services and undermined the capacity of districts to promote widespread adoption of SLM practices.

7. While it is beyond the scope of this project to address systemic capacity issues within districts<sup>49</sup>, some actions have been agreed to mitigate risks to the project. First, the project will promote a pluralist approach to extension service provision involving different players (e.g., district, NGOs, individuals, private sector) and different methods (e.g., farmer field schools, lead farmer approaches etc). DCs will not be the sole providers of extension services. CMCs will have the flexibility to choose the type of service provider – either public (DCs) or private (NGOs, private sector etc). Second, where a CMC decides to use the public extension service, the CMC will enter a Memorandum of Understanding with the DCs to clarify expectations and service standards. Further, to enhance accountability, MoIWD will sign a performance agreement with the DCs. The project will finance reasonable incremental operating costs for DCs to support the delivery of extension services in the project area and for coordination support at the community level. Also, DCs will receive performance grants contingent upon achieving the minimum performance requirements as stipulated in the performance agreement.

8. **Catchment Management Committees (CMCs).** CMCs will be established to coordinate project implementation within the catchment or sub-catchment. CMCs are new entities created under the Water Resources Act 2013 to advise NWRA on water resource management and allocation at the catchment level and

<sup>49</sup> GoM requested World Bank support on strengthening local government capacity, and a separate operation (Governance for Service Delivery Project) is under preparation.



to implement catchment protection activities. Their role in the project is therefore consistent with the existing institutional framework for water resources management. The CMCs will work through existing local institutions for community-based natural resources management and will be supported either by the extension team from the DC or by contracted service providers (e.g., NGOs). Well-functioning CMCs are critical to the success of the project, and NWRA has already launched the process of forming and training the CMCs in the target project area.

9. **Village Natural Resource Management Committees (VRNMCs).** The VNRMC is the lowest governance structure for natural resource management in Malawi. The committee is elected by a village or group of villages to represent their interests related to natural resource management (including SLM) and to formulate and enforce local bylaws. The committee will facilitate and coordinate the implementation of project activities at the micro-catchment level, based on a village-level action plan (VLAP), and act as liaison with extension service providers, lead farmers and government officials. The VNRMC is a sub-committee of the Village Development Committee (VDC) and its jurisdiction may not necessarily match the hydrological boundaries of a micro-watershed. In such cases, the project will facilitate the re-demarcation of the existing VNRMC boundaries to match the hydrological boundaries of the micro-catchment.

10. **Implementation Arrangements by Component.** Implementation arrangements by component are summarized in Table 2.1.

**Table 2.1:** Implementation Arrangements/Roles by component

Component	Lead Department	Supporting Teams
<b>Component 1 – Scaling up Landscape Restoration</b>	DLRC	NWRA
<b><i>Sub-component 1.1 - Performance-Based Grants for Landscape Restoration</i></b>		
Performance-based grants to CMCs and VNRMCs	DLRC	NWRA, DoF
Performance-based grants to private tree growers	DoF	DLRC, NWRA, DNPW
Performance-based grants to community tree grower groups	DoF	DLRC, NWRA
<b><i>Sub-component 1.2 - Matching Grants for Enhancing Agricultural-Based Livelihoods</i></b>		
Matching grants to farmer groups	DAES	DCD, DAHLD, DLRC
Matching grants to agri-enterprises	DAES	DCD, DAHLD, DLRC
<b><i>Sub-component 1.3 - Advisory, Capacity Building, and Social Marketing Services</i></b>		
Integrated training and advisory services on SLM, CSA practices and silvicultural techniques	DLRC	DAES, DCD, DoF, NWRA, DCs, FFSs
Establishment and training of farmer groups (including training on preparation of grant proposals)	DAES	DCs, DoRD, Consultants
Formation and training of CMCs and VNRMCs	NWRA/DLRC	DLRC, DoF, DoI, DNPW
Preparation or update of catchment management plans	DLRC	NWRA, DoF, Consultants, DoS
Social marketing campaign	DAES	DLRC, NWRA, DoF, Consultant
<b><i>Sub-component 1.4 – Support to Land Registration</i></b>		
Participatory land-use planning, land demarcation, adjudication and registration	DoS	LRIU
<b>Component 2 – Improving Watershed Services</b>		
<b><i>Sub-component 2.1: Performance-Based Grants to Selected Watershed Management Institutions</i></b>		
Performance-based grant to NWRA	NWRA	DWR, consultants
Performance-based grant to DoF	DoF	Consultants



Performance-based grant to DNPW	DNPW	Consultants
Performance-based grant to districts	DCs	DLGS
<b><i>Sub-component 2.2: Piloting Market-Based Mechanism for the Provision of Selected Watershed Services</i></b>		
Design and implementation of the PWS pilot	DLRC	NWRA, DoF, Consultants
<b><i>Sub-component 2.3: Enabling Infrastructure and Climate Information Services</i></b>		
Multipurpose water infrastructure (small dams, rainwater harvesting structures and solar-powered high yielding boreholes)	DWR	NWRA, Dol, DWS, Department of Fisheries, DAHLD, CMCs/VNRMCs, Consultants
Construction of irrigation schemes	Dol	DWR, DAES, DCD, CMCs/VNRMCs, DLRC, WUAs, Consultants
Other last-mile infrastructure (rural feeder roads, bridges, market shades, potable water supply)	Dol	DCs, CMCs/VNRMCs, DWS, DWR, RA, Consultants
Hydrological, weather and climate products and services	DCCMS	NWRA, DWR, DAES
<b>Component 3 – Technical and Project Management Support</b>		
<b><i>Sub-component 3.1 - Technical assistance for preparation of future phases of the project</i></b>	DWR	DoF, NWRA, DLRC, CRWB, LWB, Consultants
<b><i>Sub-component 3.2 – Biophysical and Ecological Monitoring and Impact Evaluation</i></b>		
Biophysical and ecological monitoring	DLRC	NWRA, DWR, LUANAR, Consultants
Impact evaluations	DWR	DLRC, LUANAR, Consultant
<b><i>Sub-component 3.3 – Project Management Support and Incremental Operating Costs</i></b>		
Project management support	Consultants	

11. **Project Implementation Manual (PIM).** All project operational modalities will be detailed in a Project Implementation Manual (PIM). Preparation and adoption of the PIM is a condition of project effectiveness.

### Financial Management

12. **MolWD (through the TT) will be responsible for project financial management (FM).** The TT will be staffed with qualified and experienced FM personnel. Transaction processing and reporting will be through a computerized software – the same software used under SRBMP – to ensure timely and accurate transaction processing and reporting. There is a functioning internal audit under the MolWD that also covers projects under the ministry. The FM Manual is available and will be updated to incorporate the requirements for the proposed project.

13. **Overall, the FM arrangements for the project are satisfactory.** However, there are weaknesses in the FM arrangements of the districts and the government departments/agencies that will receive performance-grants (i.e., DoF, DNPW, NWRA). The major challenges are weak internal audit function, poor management of bank accounts, delayed financial reports, use of excel spreadsheets for transaction processing and reporting and inadequate FM staff. These weaknesses are exacerbated by weak public finance management control environment characterized by poor managerial accountability and the absence of consistent application of disciplinary measures. The other deficiencies noted during SRBMP implementation was poor planning and budgeting leading to cost overruns and delays in implementation.

14. **FM actions.** To mitigate these risks, MolWD has agreed to the following actions and measures. First, all

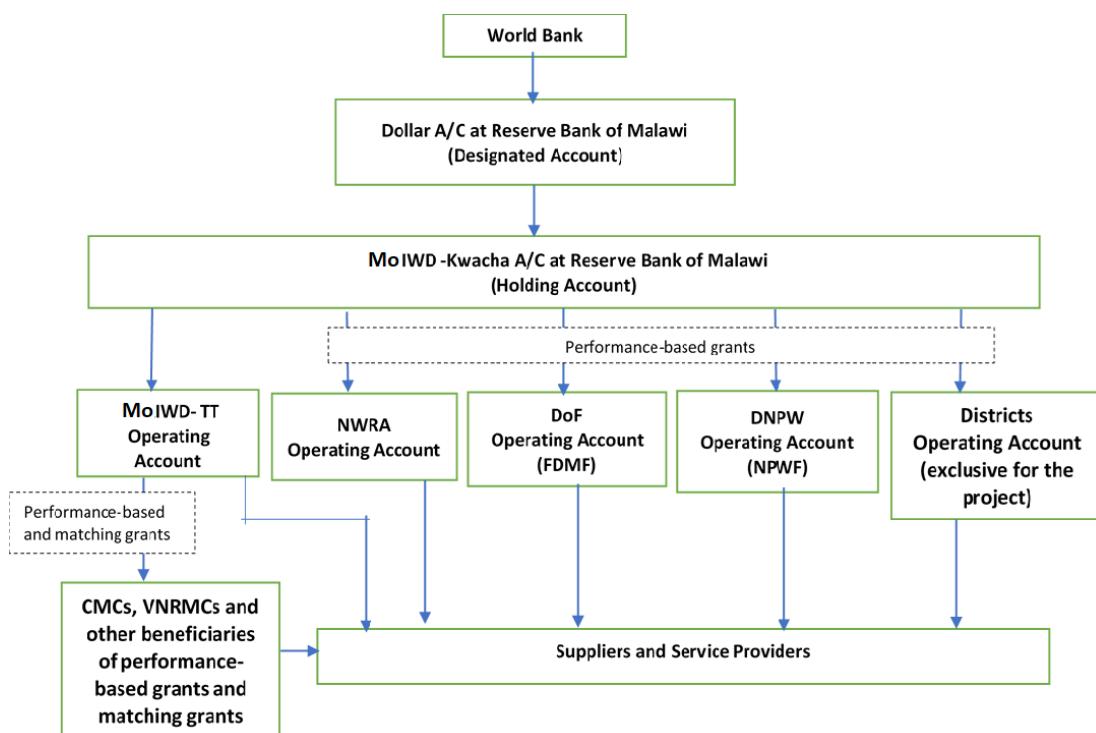


districts receiving performance grants under the project, will be required to process and report on project operations using the Integrated Financial Management System (IFMS) which is already available in the districts. Similarly, NWRA, DoF and DNPW will also be required to shift from excel-based accounting to using IFMIS or other computerized accounting software for transaction processing and reporting. Secondly, districts will be required to open exclusive bank accounts for the project, while DoF, DNPW and NWRA will use their existing fund accounts (i.e., FMDF, NPWF, and NWRA's existing operating account). Bank reconciliations will be regularly monitored by the project FM staff in the TT. Third, the internal audit function will be enhanced using the Central Internal Audit Unit staff. A robust internal audit function will ensure the timely detection of errors and other irregularities. Fourth, the project FM staff will closely work with district, departments and agencies to ensure compliance with agreed policies and procedures including timely reporting. Where necessary, the TT will recruit accounts assistants to assist districts and communities in financial management and reporting. Finally, the World Bank and government team will ensure that the project uses activity-based planning and budgeting with realistic assumptions.

## Disbursements

15. **Funds flow arrangements.** Funds flow arrangements for the project are illustrated in Figure 2.3.

**Figure 2.3: Funds Flow Chart**



16. MoIWD will open a US dollar Designated Account and a Malawi Kwacha Holding Account – both at the Reserve Bank of Malawi (RBM). MoIWD will also open a Malawi Kwacha Operating Account with a commercial Bank acceptable to the World Bank. The TT will be responsible for managing the project's Designated Account and Operating Accounts and ensuring proper and timely project accounting and reporting of project expenditures



and preparing consolidated progress reports. Eligible expenditure categories (as per the Financing Agreement) are provided in Table 2.2.

17. Funds will flow from the World Bank to the Dollar Designated Accounts and finally to the Kwacha Operating Account. The TT will prepare a six-month cash flow forecast based on agreed work plans then submit a withdrawal application request to the World Bank. The six-month estimates will be revised quarterly, and the resultant funds requirements will be used to replenish the Designated Accounts. Project expenditure can be paid from either the Designated Account or the Operating Accounts. Funds flow from MoIWD to NWRA, DoF, DNPW, Districts, CMCs and VNRMCs will be subject to meeting the performance requirements as stipulated in the performance agreements to be signed between MoIWD and the respective entities.

**Table 2.2:** Eligible Expenditure Categories

Category	Amount of the Credit Allocated (expressed in SDR)	Amount of the Grant Allocated (expressed in SDR)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works, non-consulting services, consulting services, Training, and Operating Costs for Part 1.3, Part 1.4, Part 2.2(a), Part 2.3(a), 2.3(b) and Part 3 of the Project, Matching Grants under Part 1.2 of the Project and Innovation Grants under Part 2.3(c).	36,808,000	36,808,000	100%
(2) Performance-Based Grants under Part 1.1(a) and Part 2.1 of the Project, CECF Transfers under Part 1.1(b) and PWS Transfers under Part 2.2 (b) of the Project.	20,292,000	20,292,000	100%
<b>TOTAL AMOUNT</b>	<b>57,100,000</b>	<b>57,100,000</b>	

18. **IDA Disbursement Methods.** The IDA Disbursement Letter provides details on disbursement arrangements for the project. The following disbursement methods shall apply:

- a. **Special Commitments and Direct Payments:** Special Commitments using irrevocable letters of credit may be used as well as direct payments to suppliers for works, goods, and services upon the Borrower's request.
- b. **Advances:** The project will also receive funds into the designated account using the report-based disbursement method. IDA will make the initial disbursement to the project after receiving a withdrawal application with a six-month cash flow forecast. This withdrawal application should be prepared within one month after project effectiveness. Thereafter, IDA will disburse into the respective Designated Account based on quarterly Interim Financial Reports (IFRs), which would provide actual expenditure for the preceding quarter (three months) and cash flow projections for the next two quarters (six months). The IFR will be reviewed by the World Bank's Financial Management Specialist (FMS) and approved by the Task Team Leader (TTL) before the request for disbursement is processed by the World Bank' Finance and Accounting Department.
- c. **Reimbursements:** The Government can request reimbursement in cases where project activities have been pre-financed.



## Procurement

19. Procurement activities under the proposed project will be carried out following (a) World Bank's *Procurement Regulations for IPF Borrowers (Procurement in IPF – Goods, Works, Non-Consulting and Consulting Services; July 2016, revised November 2017 and August 2018)*; (b) World Bank's *Guidelines on Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, dated July 1, 2016, and*; (c) other provisions stipulated in the Financing Agreement (FA).

20. **Institutional Arrangements for Procurement.** Procurement under this project shall be carried out by the MoIWD. The World Bank team carried out a procurement capacity assessment of MoIWD in October 2019. The assessment found that MoIWD as a procuring entity has a history of implementing World Bank-funded projects. In compliance with the Public Procurement and Disposal of Assets Act (PPDA), 2017, the MoIWD is a procuring entity with a Procurement and Disposal Unit (PDU) and an Internal Procurement and Disposal Committee (IPDC). The PDU is headed by a Chief Procurement Officer who supported by a Principal Procurement Officer and three other staff, most of whom have formal training in procurement and are familiar with the World Bank because MoIWD has implemented several World Bank-funded projects. However, current PDU procurement staff may not efficiently support procurements under the proposed project because (i) in addition to its own government-funded procurements; the MoIWD is implementing several ongoing World Bank-financed Projects and other projects funded by other development partners; (ii) the proposed project has several benefiting entities and there are many envisaged contract packages and; (iii) the current MoIWD mainstream procurement staff have limited experience in World Bank-funded procurements as they are not directly involved in project implementation which is facilitated by Project Implementation Units. The MoIWD procurement capacity will be further strengthened through the hiring of a dedicated Project Procurement Specialists (PPS) and Assistant Project Procurement Specialist (APPS) with qualifications and experience satisfactory to the World Bank. The PPS will assist the MoIWD to ensure that procurement under the project is carried out following the Procurement Regulations of the World Bank.

21. The assessment rated the overall procurement risk **Substantial**, given the procurement scope and associated risks identified. The assessment identified several risks that could adversely impact project implementation if not mitigated. Table 2.3 summarizes key risks and mitigation measures agreed with MoIWD.

**Table 2.3:** Procurement Risk Assessment and Mitigation Action Plan

Risk	Mitigation Measure	Time Frame	Responsible Agency
Delays in procurement processing due to limited capacity, staffing and workload.	MoIWD will hire a procurement specialist and assistant procurement specialist with qualifications and experience satisfactory to the World Bank to guide implementing agencies	Within nine months of project effectiveness	MoIWD
Lack of adherence to procedures including preparation of low-quality bidding documents, evaluation reports, and contracts due to inadequate understanding of the World Bank Procurement Regulations for IPF Borrowers.	MoIWD staff involved in project implementation will receive training on the World Bank Procurement Regulations for IPF Borrowers. The World Bank will also provide constant support to staff to ensure adherence to the Procurement Regulations.	Throughout project implementation	World Bank and MoIWD



Delays or unsuccessful completion of contracts due to inadequate contract management capacity	i. MoIWD will hire a project/contract management specialist with qualifications and experience (including contract management experience) satisfactory to the World Bank.  ii. Key staff who will be involved in project implementation will undergo contract management training to enhance capacity;	Within nine months of project effectiveness	World Bank and MoIWD
Loss or unauthorized access to procurement records due to poor record management	MoIWD will put in place an effective and secure record management system, with a dedicated staff to manage the records.	During project implementation	MoIWD

22. **Filing and record-keeping.** The Procurement Manual (part of the PIM) will set out the detailed processes for maintaining and providing readily available access to project procurement records, in compliance with the FA. The MoIWD will assign one person responsible for maintaining the records. The logbook of the contracts with a unique numbering system shall be maintained.

23. **Commitment control system:** The signed contracts shall be reflected in the commitment control system of the MoIAWD's accounting system or books of accounts as commitments whose payments should be updated with reference made to the payment voucher. This approach will ensure a complete record system whereby the contracts and related payments can be corroborated.

24. **PPSD:** As part of the preparation of the project, MoIWD has prepared its PPSD, using inputs taken from a market survey and analysis of potential contractors and suppliers available for the proposed procurement scope, the assessment of operational context, their institutional capacity as well as procurement-related risk analysis. Through these analytical assessments, the PPSD made recommendations on procurement arrangements under the proposed project and the associated Procurement Plan addresses how procurement activities would support the achievement of the PDO and deliver the best value for money under a risk-managed approach.

25. **Summary of procurement arrangements.** The World Bank has reviewed the outputs of the PPSD developed by the MoIWD and agrees with the proposed procurement arrangements under the project. The procurement method and review thresholds may be subject to the World Bank's review and modification throughout the project period based on the procurement performance and risk rating of the project. The World Bank will make official notice about such changes promptly to ensure smooth implementation.

26. **Procurement templates.** The World Bank's Standard Procurement Documents (SPDs) shall be used for the procurement of goods, works, and non-consulting services under International Competitive Procurement. National Bidding documents may be used under national open competitive procurement subject to the exceptions stipulated under paragraph 5.4 of the Procurement Regulations.

27. **National procurement procedures.** National open competitive procurement procedures may be used while approaching the national market. National open competitive procurement will observe the requirements stipulated in the Procurement Regulations. Other national procurement arrangements (other than national open competitive procurement) that may be applied by the Borrower (such as limited competitive bidding, request for quotations, direct selection) shall be consistent with the World Bank's Core Procurement Principles and ensure that the World Bank's Anti-Corruption Guidelines and Sanctions Framework and contractual remedies set out in the Legal Agreement apply. However, the request for bids/request for proposals document shall require that



bidders/proposers submitting bids/proposals present a signed acceptance at the time of bidding, to be incorporated in any resulting contracts, confirming application of, and compliance with, the World Bank's Anti-Corruption Guidelines, including without limitation the World Bank's right to sanction and the World Bank's inspection and audit rights, and that the Procurement Documents include provisions, as agreed with the World Bank, intended to adequately mitigate against environmental, social (including sexual exploitation and abuse and gender-based violence), health and safety ("ESHS") risks and impacts.

**28. Procurement Thresholds.** Table 2.4 below shows the Thresholds and Procurement Methods to be used under the project given a risk rating of Substantial:

**Table 2.4: Procurement Thresholds Methods and Prior-review Thresholds**

Prior-review Thresholds		Thresholds for Procurement Methods								
Procurement Type	Substantial Risk (\$'000)	Works			Goods, IT & Non-Consulting Services			Shortlist of National Consultants		
<b>Works</b>	10,000	Open International or ICB (\$'000)	Open National or NCB (\$'000)	Request for Quotation or National Shopping (\$'000)	Open international or ICB (\$'000)	Open National or NCB (\$'000)	Request for Quotation or National Shopping (\$'000)	Consulting Services (\$'000)	Engineering & Construction Supervision (\$'000)	
<b>Goods, IT &amp; Non-Consulting Services</b>	2,000	≥	<	≤	≥	<	≤	<	≤	
<b>Consultants (Firms)</b>	1,000	7,000	7,000	200	1,000	1,000	100	200	300	
<b>Individual Consultants</b>	300									

\*These thresholds are for the initial procurement plan for the first 18 months. The thresholds will be revised periodically.

**29. Procurement plan.** MoIWD has prepared a Procurement Plan for the first 18 months, based on the findings and recommendations of the PPSD. The Procurement Plan is subject to public disclosure and will be updated on an annual basis or as needed. The updates or modifications of the Procurement Plan shall be subject to the World Bank's prior review and no objection. The World Bank shall arrange for the publication of the Procurement Plan and any updates on the World Bank's external website directly from STEP, while MoIWD will do the publication on its project website.

**30. Monitoring by STEP.** STEP will be used to prepare, clear, and update procurement plans and conduct all procurement transactions for the project. Through the mandatory use of STEP by the MoIWD, the World Bank will be able to consolidate procurement/contract data for monitoring and tracking of all procurement transactions. Using STEP, comprehensive information of all prior and post review contracts for goods, works, technical services, and consultants' services awarded under the whole project will be available automatically and systematically on a real-time basis whenever required, including, but not limited to: (a) the reference number as indicated in the Procurement Plan and a brief description of the contract; (b) the estimated cost; (c) the procurement method; (d) timelines of the bidding process, (e) the number of participated bidders; (f) names of rejected bidders and reasons for rejection; (g) the date of contract award; (h) the name of the awarded supplier, contractor, or consultant; (i) the final contract value; and (j) the contractual implementation period.

**31. Publication of Procurement Information.** The project will follow the World Bank's policies on publication



of procurement information that are outlined in the World Bank's Procurement Regulations.

32. **Fiduciary oversight by the World Bank.** The World Bank shall prior review contracts as provided for in the procurement plan. Contracts below the prior-review thresholds shall be subject to post review according to procedures outlined in World Bank Procurement Regulations on an annual basis by the World Bank team. The rate of post review is initially set at 20 percent. This rate may be adjusted periodically based on the performance of the Procuring Entity. Also, the World Bank Procurement Specialist will regularly participate in implementation support missions to assist in monitoring procurement procedures and plans.

33. **Training, Workshops, Study Tours, and Conferences.** Training activities would comprise workshops and training, based on individual needs, as well as group requirements, on-the-job training, and hiring consultants for developing training materials and conducting training. All training and workshop activities (other than consulting services) would be carried out based on approved Annual Work Plans/Training Plans that would identify the general framework of training activities for the year, including (i) the type of training or workshop; (ii) the personnel to be trained; (iii) the institutions which would conduct the training and reason for selection of this particular institution; (iv) the justification for the training, focusing on how it would lead to effective performance and implementation of the project; (v) the duration of the proposed training; and (vi) the cost estimate of the training. Report by the trainee(s), including completion certificate/diploma upon completion of training, shall be provided to the Project Coordinator and will be kept as parts of the records, and will be shared with the World Bank if required.

34. **Training Plan.** A detailed plan of the training/workshop describing the nature of the training/workshop, number of trainees/participants, duration, staff months, timing and estimated cost will be submitted to IDA for review and approval before initiating the process. The selection methods will derive from the activity requirement, schedule and circumstance. After the training, the beneficiaries will be requested to submit a brief report indicating what skill has been acquired and how these skills will contribute to enhance their performance and to attain the project objective.

35. **Operational Costs.** Operational costs financed by the Project would be incremental expenses, including office supplies, operation and maintenance of vehicles, maintenance of equipment, communication, rental expenses, utilities, consumables, transport and accommodation, per diem, supervision, and salaries of locally contracted support staff. Such services' needs will be procured using the procurement procedures specified in the PIM accepted and approved by the World Bank.

36. **Procurement Manual.** Procurement arrangements, roles and responsibilities, methods and requirements for carrying out procurement under the proposed project shall be elaborated in detail in the Procurement Manual, which will be a section of the PIM. The PIM shall be prepared by the Recipient and agreed with the World Bank before project effectiveness.

## **Strategy and Approach for Implementation Support**

37. The strategy for implementation support has been developed based on the nature of the project and its risk profile. The aim is to make implementation support to the client more flexible and efficient by focusing on implementing the risk mitigation measures defined in the Systematic Operations Risk-rating Tool (SORT). The World Bank Task Team will use a combination of (i) periodic implementation support missions to review overall project implementation performance and progress toward the achievement of the PDO; and (ii) ongoing technical assistance and guidance in areas of weaknesses and where new approaches/procedures have been introduced. This approach has proven to be effective in other projects and programs in Malawi, including the previous



SRBMP. A mid-term review will be carried out mid-way through the implementation phase. It will include a comprehensive assessment of the progress in achieving project objectives as laid out in the Results Framework. The MTR will also serve as a platform for revisiting design issues that may require adjustments to ensure satisfactory achievement of the PDO. At the close of the project, the Government and the World Bank will carry out separate implementation completion reviews to assess the success of the project and draw lessons from its implementation.

### Implementation Support Plan and Resource Requirements

38. The World Bank Task Team Leaders (TTLs) will provide ongoing support by coordinating with the client and among World Bank staff who will provide implementation support on technical, fiduciary (FM and procurement), and E&S standards. The TTL will be based in Lilongwe, and implementation will be supported by task team members in the World Bank's Headquarters in Washington DC or Regional offices. Field missions will be organized quickly should the need arise, and international expertise can be mobilized to provide global best practices. Formal missions will be carried out at least twice per year. Table 2.5 shows the expected skill requirements, timing and resource requirements for implementation support over the life of the project. The implementation support plan is flexible and open to adjustment throughout the project period.

39. In conjunction with Government counterparts, the World Bank will monitor progress against the monitoring indicators in the Results Framework. The World Bank will also monitor risks and update the risk assessment and risk management measures, as needed. A midterm review will involve a more in-depth stocktaking of performance under the project. Based on the evaluation of progress at the midpoint, Government counterparts and the World Bank will consider recommendations for improvements or changes. The World Bank team will also maintain close coordination with other development partners supporting the Government's landscape restoration agenda.

**Table 2.5 - Implementation Support Skills Mix**

Skills Needed	Resource Estimate (Staff weeks/year)	Staff location
Task Team Leader	12	Based in Country Office
Co-Task Team Leader (Natural Resources Management Specialist)	12	Based in HQ or Regional Office
Co-Task Team Leader (Agriculture Specialist)	12	Based in Country Office
Water Resources Management/Irrigation Specialist	10	Based in Country Office
Rural Development Specialist	8	Based in HQ or Regional Office
Agronomist	6	FAO staff
Rural Roads Engineer	3	Based in Country Office
Procurement Specialist	6	Based in Country Office
Financial Management Specialist	6	Based in Country Office
M&E Specialist	8	Based in Country Office
Natural Resources Economist	8	Based in HQ or Regional Office
Communication Specialist	6	Based in Country Office
Social Development Specialist	8	Based in Country Office
Environmental Specialist	6	Based in Country Office
Operations Analyst	12	Based in Country Office
Team Assistant	12	Based in Country Office

**ANNEX 3: Economic and Financial Analysis****COUNTRY: Malawi**  
**Malawi Watershed Services Improvement Project*****Methodology and Assumptions***

1. A cost-benefit model has been used to assess the ex-ante efficiency of the project. Annual cost and benefit flows are estimated as the difference between without-project and with-project net benefits for direct beneficiaries. It is expected that without the project, land degradation will continue its current path causing direct losses to those that rely on land, forests, and woodlands for their livelihood. Production yields will go down or farmers will have to increase their input costs to maintain current yields. Non-agricultural land in the watershed will also continue to deteriorate without the project due to soil erosion. Downstream from the project areas, continued land degradation will also affect areas and households through increased flood risk and sedimentation of irrigation and hydropower plants. Deterioration of raw water quality will lead to an increase in the cost of treating water for domestic use. Incremental benefits have been estimated for project Components 1 and 2. The analysis is primarily based on an estimation of (i) improved productivity resulting from sustainable soil and water management practices and improved agronomic practice; (ii) farm-level incremental benefits; (iii) diversified and increased farm benefits from enterprise support and enhanced access to financial services; and (iv) GHG emissions estimates generated over 26 years.
2. The project will deliver significant climate change adaptation Co-Benefits through Component 2, by improving resilience to droughts through small-scale infrastructure and improved climate information systems, as well as improving the planning and management of increasingly scarce water in response to climate-related events. The project is also expected to deliver significant mitigation Co-Benefits, particularly in Component 1, through landscape restoration interventions on approximately 95,000 ha of land in the Shire River Basin using various agricultural technologies and forest management improvements. The economic analysis was performed considering three scenarios: (i) without considering the social value of carbon-the base scenario; (ii) considering the social value of carbon using high shadow price of carbon; and (iii) considering the social value of carbon using low shadow price of carbon.
3. Economic crop models have been calculated by removing taxes and duties on financial prices of imported inputs such as fertilizer and pesticides and applying an economic conversion factor (cf) ranging between 0.9 and 0.95. All prices are current (second quarter of 2019) prices. The opportunity cost of family labor has been valued at an estimated of 600MK/person day, by applying a CF of 0.75.
4. The financial project costs have been converted to economic costs, which exclude taxes, duties, and price contingencies. The analysis is based on a twenty-five-year period, during which the MWASIP will generate benefits.

***Estimation of Benefits***

5. **Crops.** In the Middle Shire, maize represents approximately 66 percent of land under crop, while horticulture is grown on 5 percent and rice is grown on 3 percent of arable land. The areas targeted for each crop are thus approximately 52,404 ha of maize, 3,970 ha of horticulture crops, and 2,382 ha of rice. About 40 percent of this area is expected to be irrigated thanks to the project. To derive financial benefits at the household level, this analysis assumes that an average household will grow 0.66 ha of maize, 0.1 ha of horticulture and 0.25 ha of rice. Crop yields are expected to increase gradually during the project lifetime and to continue after project



completion through the gradual adoption of improved land management practices and technology. Full adoption is assumed to be reached during the eighth year after project start, and approximately two years after project completion. Average crop yields in the project intervention area are expected to increase mainly through the adoption of improved varieties, soil fertility improvement, and minimal external inputs. Horticulture and rice yields are also likely to increase using irrigation. Assumptions are presented in Table 3.1.

**Table 3.1:** Average Yields Without and With Project

Crop	Yield (kg/ha)		%increase
	Without	With	
<b>Maize</b>	750	2395	219%
<b>Horticulture</b>	5000	7500	50%
<b>Rice</b>	800	1960	145%

6. The expected yields depend on the type and combination of technologies adopted. Table 3.2 summarizes the mix of possible technologies and the associated expected yields for the three crops considered.

**Table 3.2:** Crop and Technology Combination Scenarios and Expected Yields

Crops	Technologies	Scenarios			
		1	2	3	4
<b>Maize</b>	Variety	Local	Improved	Improved	Improved
	Conservation Agriculture	-	yes	yes	yes
	Agro-forestry	-	-	yes	yes
	Without project	50%	505	-	-
	With project	10%	10%	50%	30%
	Yield (kg/ha)	750	1700	2500	3000
<b>Horticulture (Tomato)</b>	Variety	Improved	Improved	improved	
	Fertilizer	yes	yes	yes	
	Pesticides	-	yes	yes	
	Irrigation	-	-	Yes	
	Without project	100%	-	-	
	With project	25%	50%	25%	
	Yield (kg/ha)	5000	7500	10,000	
<b>Rice</b>	Variety	Local	Improved	Improved	Improved
	Fertilize	-	yes	yes	yes
	Irrigation	-	-	yes	yes
	Herbicide/Pesticide	-	-	-	yes
	Without Project	100%			
	With project	10%	30%	50%	10%
	Yield (kg/ha)	800	1200	2500	2700

7. **Livelihood interventions.** Several enterprise models were included in the analysis, and these include the processing of oil crops, honey production, and a range of small-stock enterprises. These enterprises are all assumed to be in the “with-project” scenario, as the project will promote these. Since this component will be demand-driven, it is difficult to estimate how many groups will engage in each type of enterprise. There may also well be additional enterprises that are not included in the analysis at this stage. Given this constraint, an average



annual return in MK/year was calculated.

8. **Landscape restoration benefits.** This benefit is estimated using secondary information on the benefits and costs of landscape restoration activities in the Shire River Basin. The analysis showed that stakeholders including farmers, Illovo Sugar, EGENCO, and water boards, lose approximately US\$23.7 - 34.2 million every year because of soil erosion in the shire basin.

9. **GHG accounting and mitigation co-benefits.** The project will deliver significant climate mitigation co-benefits through landscape restoration interventions. The GHG accounting calculation accounted for the emissions associated with the landscape restoration activities on approximately 95,000 ha of land in the upper and middle Shire River Basin, using various SLM technologies (i.e., soil and water conservation, vegetative riparian buffers, agricultural techniques, community forestry and wood lots, plantation forestry management). The estimated net GHG emissions<sup>50</sup> attributed to landscape restoration activities under Component 1 of the project is **-4,591,402** tons of CO<sub>2</sub>e over 26 years (the project's economic life), with net annual average emissions of -176,592 tons of CO<sub>2</sub>e. On a per hectare basis, the support for landscape restoration activities will result in estimated net emissions of -48 tons CO<sub>2</sub>e/ha and -1.9 tons CO<sub>2</sub>e/ha/year. The project will also deliver significant climate change adaptation co-benefits through (i) strengthening key institutions charged with responsibility to manage Malawi's watersheds and building their adaptive capacity; (ii) construction of multipurpose water sources (small to medium dams, rain water harvesting structures, high yielding boreholes) to diversify the water sources in each target watershed, increase water supply for multiple use and therefore mitigate against the risk of drought; (iii) construction of irrigation systems to mitigate the risk of rainfall variability on agricultural-based livelihoods; and (iv) developing a suite of hydrological, weather and climate products and services to enable climate-informed decision-making by different users (including small holder farmers).

### ***Financial Analysis***

10. The financial viability of the main crop and farm models that will be supported by the project were assessed to determine their profitability and effects on the beneficiary's income. Financial crop models have been prepared based on the prevailing farming system in the Middle Shire and information available from similar projects and programs supported by the Government and other development partners. The models compare the "future without project" and "future with project" scenarios.

11. Without the project, it is expected that farmers would continue with low-input, low-output, largely rain-fed production systems, which are increasingly being threatened by loss of soil fertility and soil erosion. Available information from ongoing interventions supporting improved land management in Malawi suggests that there is scope for significant increases in productivity, through conservation agriculture, improved soil and water conservation, agroforestry, and small-scale irrigation, reflected in the "future with the project" scenario. For financial analysis, family labor has been valued at 800 MK per person-day. Given land scarcity in the Middle Shire in particular, this analysis does not assume any increase in cropped area nor change in crops pattern distribution.

12. Several enterprise models were included in the analysis. These include processing of oil crops, honey production and a range of small-stock enterprises. These enterprises are all assumed to be in the "with-project" scenario, as the project will promote these. Since this component will be demand-driven, it is difficult to estimate how many groups will engage in each type of enterprise. There may also well be additional enterprises that are not included in the analysis at this stage.

<sup>50</sup> GHG emissions were estimated using the FAO's EX-ACT tool.



### **Project Costs**

13. The project costs differentiated by components are provided in Table 3.3 below. The annual Operation and Maintenance costs were estimated to be US\$1.05 million, which is 1.5% of infrastructure costs.

**Table 3.3:** Project Costs

Components	Estimated Cost (US\$ Million)
Scaling up Landscape Restoration	53
Improving Watershed Services	82
Technical and Project Management Support	25
<b>Total</b>	<b>160</b>

### **Results of the Financial Analysis**

14. **Summary results of the Financial Analysis.** Table 4.4 presents a summary of the financial analysis of crop models. At the farm level, the annual incremental benefit varies according to which crops are grown. The average net margins per ha and return to labor appear much higher for horticulture than rice and maize.

**Table 3.4:** Summary of financial returns on crop production

	Without project			With project		
	Maize	Horticulture	Rice	Maize	Horticulture	Rice
Area per HH (ha)	0.66	0.1	0.25	0.66	0.1	0.25
Income (MK/ha/year)	20,902	470,788	115,119	52,434	697,245	343,667
Return to labor (MK/person-day)	1163	6402	1655	1786	6650	23260
Income per HH (MK/year)	13796	47079	28779	34606	67723	85917

15. This table also presents the financial results of the combined cropping patterns in the with-project situation. For maize, the net margin per household, for the same cultivated area as in the without-project scenario, would increase from 13,796 MK without the project to 34,606MK with the project. For horticulture, under the same conditions, the increase is from 47,079MK up to 67, 723 MK per household and year. For rice, it goes from 28, 779MK to 85, 917 MK. Overall income weighted average would go from 27,976 MK/year/household to 54,352 MK/year/household, while value of production of affected households would rise from 1,671 to 3,269 million MK.

16. The results of the gross margin analysis for selected livelihood diversification activities are presented in Table 3.5. The results indicate that these activities can potentially boost the income of target farming households.

**Table 3.5.** Gross margin analysis for selected livelihood diversification activities

Type	Unit	Livelihood activities					Average
		Oil Press	Goat	Layers-egg	Broiler	Honey	
Investment	MK/year	5,673,831	595,479	707,820	1,126,617	3,179,216	2,256,592
Recurrent costs	MK/year	4,109,441	249,222	436,239	117,975	1,666,940	1,315,963
Benefits	MK/year	5,451,226	599,475	1,431,606	1,019,108	5,994,750	2,899,233
Gross margin	MK/year	<b>1,341,785</b>	<b>350,253</b>	<b>995,367</b>	<b>901,133</b>	<b>4,327,810</b>	<b>1,583,270</b>

**Results of the Economic Analysis**

17. The results of the economic cost-benefit analysis are summarized in Table 3.6. The results indicate that the project is economically viable under all the scenarios assumed. The analysis shows that the project embodies significant carbon sink benefits. The inclusion of these benefits significantly increases the economic returns of the project.

**Table 3.6:** Summary Results of the Economic Cost-benefit Analysis

No	Scenarios	NPV million \$	IRR (%)	B/C Ratio
1	Without social value of Carbon	85.97	15.76%	1.87
2	With social value of Carbon-high shadow price of Carbon	304.6	31%	
3	With social value of Carbon- low shadow price of Carbon	205.4	24%	

18. The sensitivity analysis indicates that the economic viability of the project is robust under most of the assumptions. The results become unfavorable, under the unlikely assumption of 20% cost escalation and 20 percent benefit reduction (See Table 3.7).

**Table 3.7: Sensitivity Analysis**

Sensitivity tests	EIRR	NPV 6% (million USD)
	15.76%	85.97
10% increase in project costs	13.99%	76.08
20% increase in project costs	12.49%	66.20
30% increase in project costs	11.18%	56.31
10% increase in project benefits	17.66%	104.45
20% increase in project benefits	19.54%	122.93
30% increase in project benefits	21.40%	141.42
10% reduction in project benefits	13.81%	67.49
20% reduction in project benefits	11.82%	49.00
30% reduction in project benefits	8.35%	20.63
Benefits delayed by 1 year	13.27%	70.76
Benefits delayed by 2 years	11.42%	56.41
10% increase in costs and 10% reduction in benefits	12.18%	57.60
20% increase in costs and 20% reduction in benefits	9.0%	29.23
80% adoption rate of SLM/CSA practices	14%	67.97
75% adoption rate of SLM/CSA practices	13%	63.47
50% adoption rate of SLM/CSA practices	11%	40.97

**ANNEX 4: Framework for Selection and Appraisal of Infrastructure Investments****COUNTRY: Malawi**  
**Malawi Watershed Services Improvement Project**

1. This Annex outlines the criteria for selection and appraisal of enabling infrastructure investments to be financed under sub-component 2.3. The purpose of the infrastructure investments is to maximize the livelihood benefits from improved watersheds and to enhance the resilience of both the farming community and the watershed. The investment will include (i) multi-purpose water infrastructure to increase access to water for multi-purpose use, while at the same time protecting people from floods; and (ii) last-mile infrastructure (including small to medium irrigation systems, rural feeder roads and bridges) to support agricultural productivity and market access.
2. A framework has been developed because the exact scope of the investments cannot be finalized before project appraisal as it requires participatory planning and prioritization with the communities in the target catchment areas. The framework provides a criterion for selection and prioritization of infrastructure investments according to relevance to the PDO, readiness, environmental and social (E&S) constraints and risks, implementation capacity, cost, and water availability/sustainability.
3. **General Criteria for Selection of Investments.** The following criteria shall be used for selection of enabling infrastructure investments to be considered for financing under the project:
  - a. Selected infrastructure investments must be within the catchment areas targeted under the project and benefit the same areas and beyond.
  - b. Selected investments must be identified through a participatory approach with the involvement of the CMCs, VNRMCVs, beneficiary communities, local authorities and other interested parties;
  - c. Selected infrastructure shall complement other program (MWASIP and MRDRM) interventions to maximize the livelihood benefits and enhance the resilience of farmers and the watershed
  - d. Selected water infrastructure must directly increase water availability for productive uses, including irrigation, fisheries, livestock and water supply for productive use;
  - e. Selected last-mile infrastructure must directly increase market access for the project beneficiaries of matching grants and irrigation services.
  - f. Selected investments shall be economically feasible. Where additional interventions are required to realize the full benefits of the investments chosen, financing for those must be confirmed before the package financed under this project goes to tender.
  - g. Selected investments must contribute to enhancing resilience to climate-related events, including flood and drought management, or sediment control; or be otherwise in line with the project development objective;
  - h. Selected investments must follow the social, environmental, procurement and financial management requirements of the World Bank and the Government of Malawi, and obtain all required environmental and regulatory clearances ahead of any construction;



- i. The project will aim first to avoid adverse impacts (at site or downstream) to people and the environment by locating these interventions away from protected areas, areas of high conservation value, and areas where social impacts such as land acquisition cannot be mitigated. The investment will not be prepared for, or take place in, areas where the standards and conditions of the Bank's Environmental and Social Standard 5 (ESS5 of the World Bank's Environmental and Social Framework (ESF)) cannot be ensured. A mitigation hierarchy will be applied, whereas involuntary resettlement will be avoided, and if unavoidable, it will be minimized and mitigated.
- j. Selected investments shall not adversely affect the quality or quantity of water flows to other riparians.
- k. Selected investments shall be considered small-to-medium scale projects. Investments in irrigation systems shall support less than 2,000 ha, while any proposed dams/weirs shall be lower than 15m and/or maximum volume of 3Mm<sup>3</sup> (ICOLD definition of large dams).

**4. Appraisal Criteria and Standards of Preparation.** The following appraisal criteria and standards of preparation shall apply:

- a. Design of small dams or weirs shall follow the established guidelines on international best practice published by the Food and Agriculture Organization (FAO) and National guidelines as presented in the Engineering Handbook for Design and Construction of Small and Medium-Sized Dams in Malawi (2019).
- b. Preparation shall be based on the completion of detailed field surveys, hydrological, geotechnical, socioeconomic assessments and engineering designs to ensure feasibility, cost-effectiveness, and compliance of technical standards with international best practice;
- c. Following Environmental and Social (E&S) screening, the necessary safeguard instruments will be prepared, e.g., ESIA, ESMPs, RAPs, and suitable mitigation measures for any significant impacts together with any residual project impacts should be detailed;
- d. Preparation should be based on an appropriate design horizon for each kind of asset, based on forecasts of population, type crops and fish, water use requirements, hydrology (water quantity and quality), and project E&S impact. These assumptions must be suitably validated by implementing comprehensive E&S monitoring;
- e. Selected investments should avoid areas of disputed land tenure, although such areas will be considered with clear proposals for early resolution. Priority will be given to subprojects that avoid land acquisition altogether or can obtain land through donation;
- f. A detailed Project Implementation Plan must be prepared for each selected investment with realistic timelines for each stage of preparation and implementation;
- g. Adequate budget provisions must be confirmed, including price and physical contingencies as appropriate;
- h. Adequate consideration is to be given to the management arrangements, and operations and maintenance costs to ensure investments are sustainable from a financial and institutional point of view;



- i. Selected investments shall promote and adhere to International Best Practice and the requirements of the World Bank Group Environmental, Health, and Safety (EHS) Guidelines;

**5. Prioritization.**

- a. Ceteris paribus, priority shall be given to infrastructure investments that enhance agricultural-based livelihoods in the target catchments
- b. Cost-effectiveness and cost-efficiency shall be the critical criteria for selecting investments. Ceteris paribus, interventions with higher expected return shall be given priority.
- c. Ceteris paribus, interventions with the established value chain (access to market) shall be given priority.

**6. Selection and Approval Cycle**

- a. *Stage 1 – Identification:* The TT shall carry out participatory planning and consultative meeting with communities in the target catchments to confirm infrastructure needs and identify a long list of investments to be screened. Some of the infrastructures may have already been identified by the communities as part of their sub-catchment management plan or Village-Level Action Plan (VLAP)
- b. Any proposed investments are to comply with the selection criteria outlined above. An initial environmental and social screening will be conducted for the proposed investments to identify any major issues and the most adequate type of environmental and social management instruments. Considering feedback received at the meeting, the TT will then submit a finalized set of investments and Terms of Reference for feasibility studies to the World Bank for comments, review and no objection.
- c. *Stage 2 – Feasibility studies and detailed design:* The TT and lead technical government department will prepare Detailed Design Reports (DDR) for investments contained in the approved infrastructure plan. This will involve compiling feasibility reports with detailed engineering designs, cost projections, and the environment and social assessments as needed in line with the requirements of the World Bank and the Government of Malawi. In parallel, the environmental and social management instruments will be prepared and submitted to the World Bank for review and no objection.
- d. During the preparation of the feasibility studies, the TT shall conduct consultations with the local community and other relevant project stakeholders on all aspects of the proposed investment(s), while making available all relevant information to the public. Evidence of consultations and community agreement are to be integrated into the feasibility study reports.
- e. Feasibility studies and detailed designs within the procurement prior review threshold shall be reviewed by the World Bank for review and no-objection. The selected investments will then be submitted to the PTC for endorsement.
- f. *Stage 3 - Setting up Management, O&M arrangements:* The lead technical department and TT shall be responsible for establishing the required management structures for service delivery, operation and maintenance of the infrastructure. These management structures should be established at the early stages of project design and be part of the supervision arrangements. Training should be provided throughout the construction phase to the established management team.



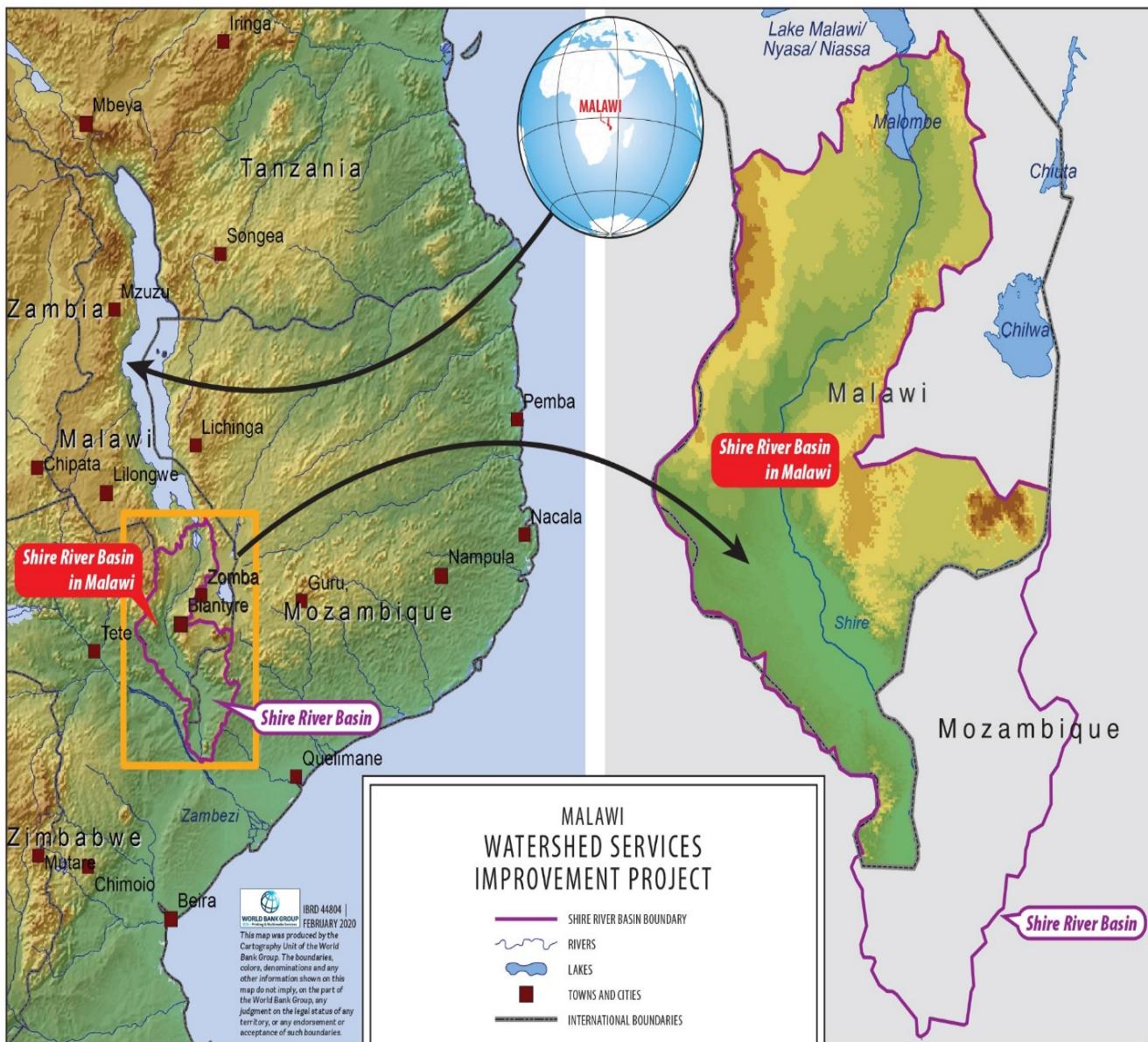
- g. *Stage 4 – Bid Documents and Bidding:* The TT shall be responsible for managing the tendering processes in line with World Bank procurement regulations.
- h. *Stage 5 – Construction Supervision, Quality Assurance, Monitoring, and Evaluation:* The lead technical department and TT shall be responsible for putting in place arrangements for the supervision of all contracts. All civil and mechanical works investments would require comprehensive on-site construction supervision, following international best practices. If needed, the lead technical department and TT may procure and manage supervision consultants to address any capacity gap for effective construction supervision.
- i. ***Stage 6 – Transfer, Management, O&M of the Infrastructure:*** The lead technical department and the TT shall be responsible for formally handing over the infrastructure to the management team established during stage 3, provide the required training and technical support for efficient and sustainable operations of the infrastructure and services.



## ANNEX 5: Maps

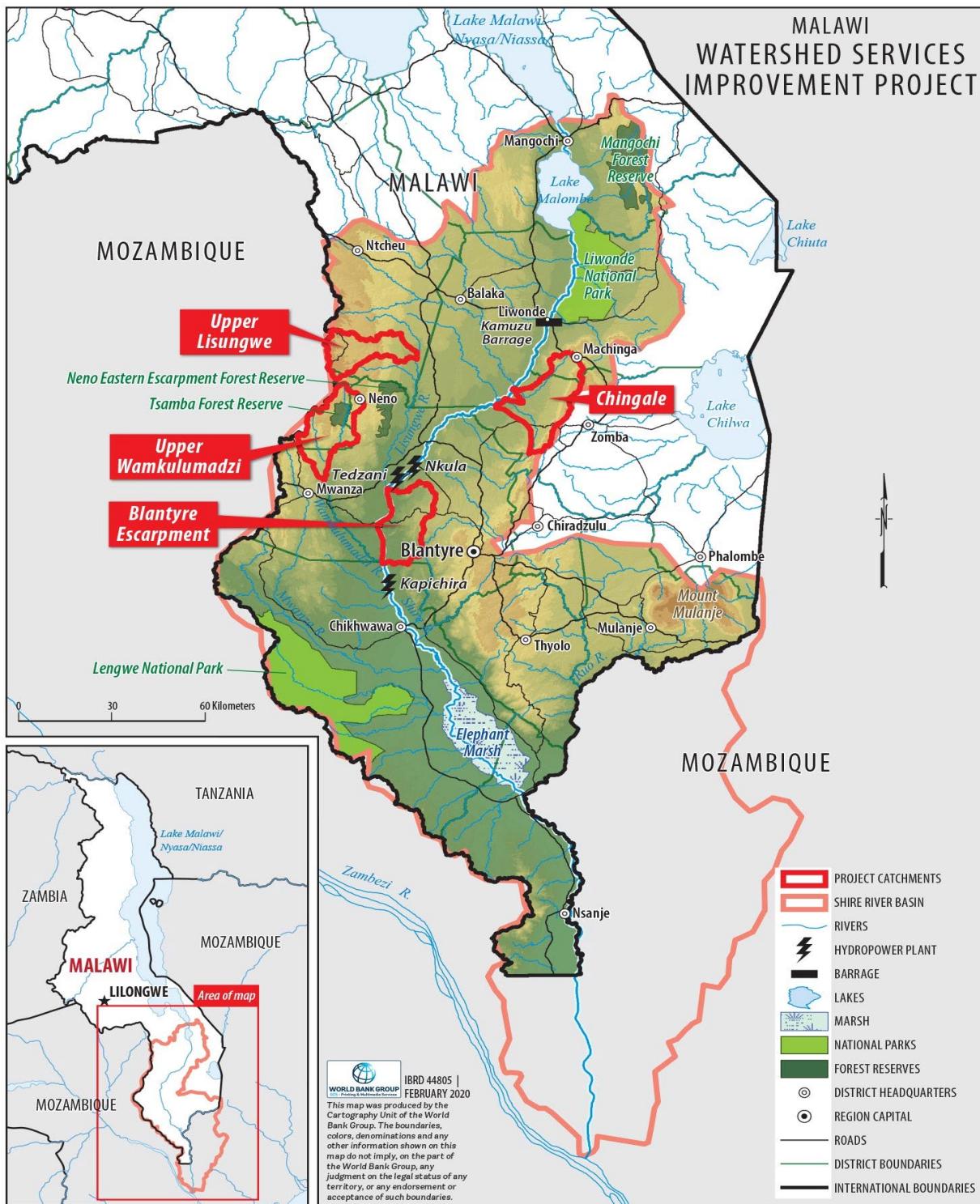
### COUNTRY: Malawi Malawi Watershed Services Improvement Project

Map 1: Project Location Map



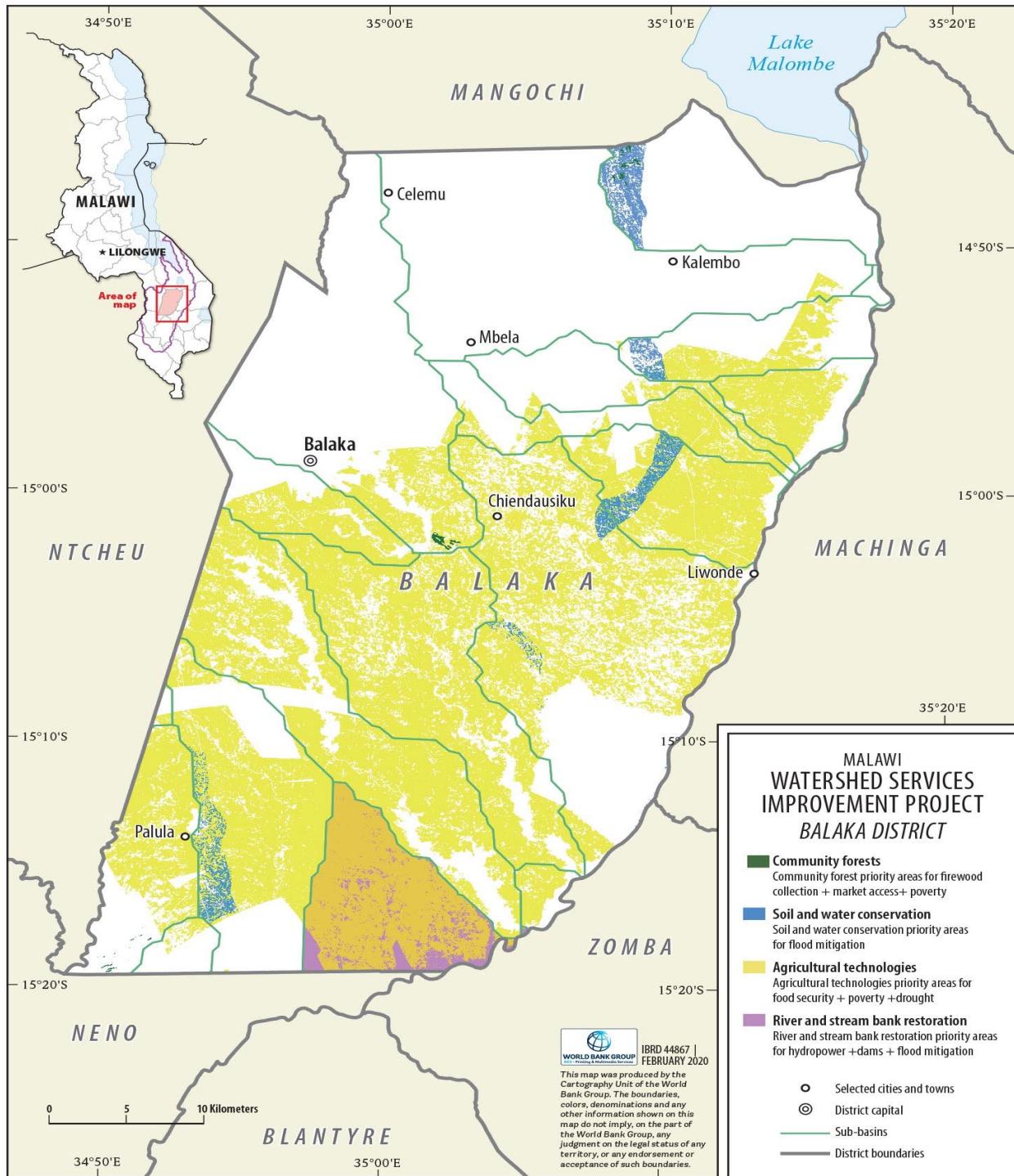


Map 2: Location of some of the targeted watersheds in the middle Shire



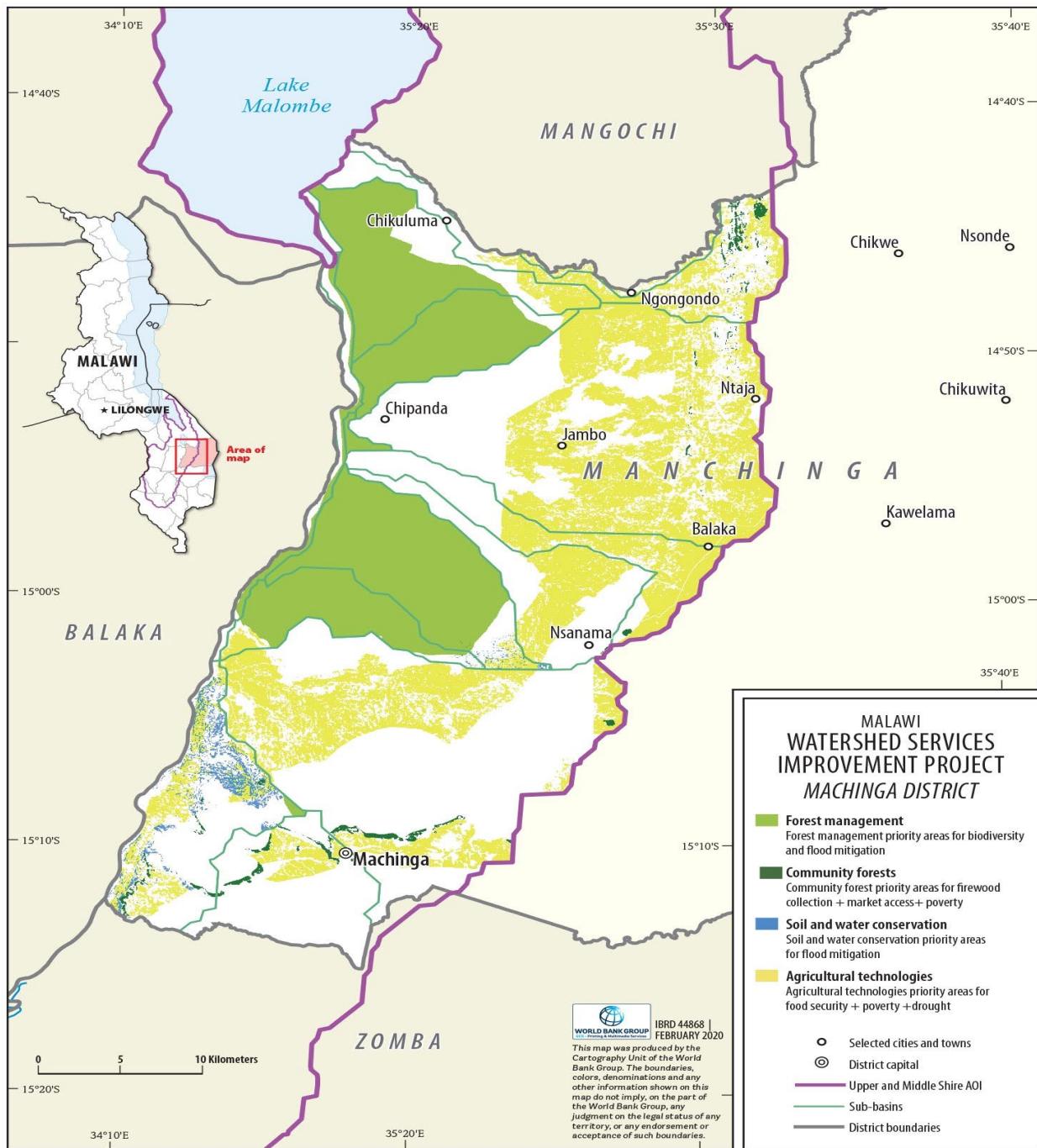


Map 3: Priority landscape restoration opportunities for Balaka District (upper Shire)



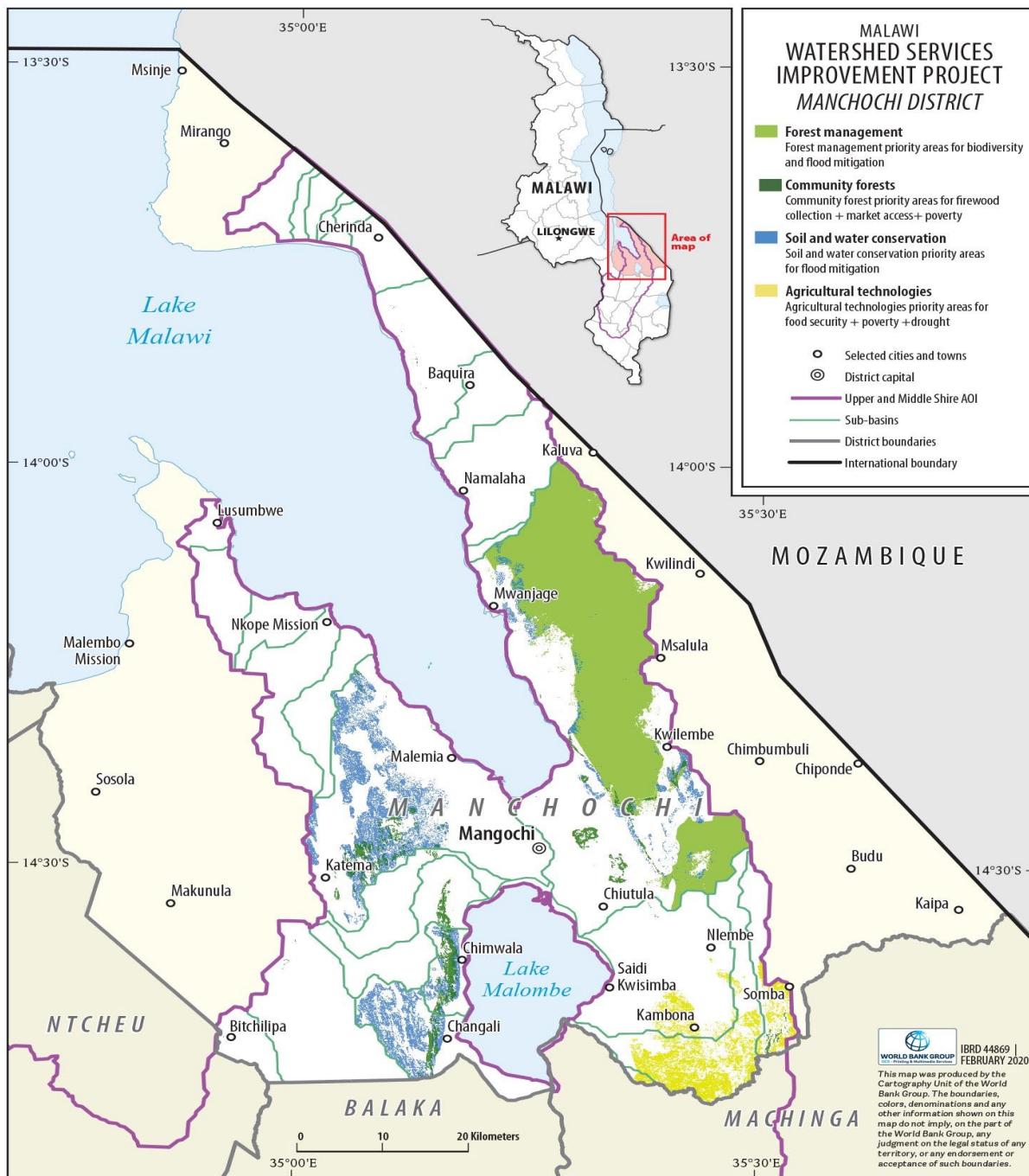


Map 4: Priority landscape restoration opportunities for Machinga District (upper Shire)





Map 5: Priority landscape restoration opportunities for Mangochi District (upper Shire)



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