2025

Malawi's First Biennial Transparency Report to the UNFCCC

CHAPTER ON FINANCIAL, TECHNOLOGY TRANSFER AND CAPACITY BUILDING SUPPORT NEEDED AND RECEIVED AND OTHER INFORMATION RELEVANT TO THE CONVENTION AND PARIS AGREEMENT

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ES.4 Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

This chapter and its associated CTF Tables III.6, III.7, III.8, III.9, III.10, III.11, III.12 and III.13 provide detailed information on financial support needed and received, technology development and transfer support needed and received, capacity building support needed and received and capacity building support needed and received for the implementation of article 13 of the Paris Agreement and transparency-related activities.

Malawi's national circumstances are described in the context of the climate finance landscape and institutional arrangements relevant to reporting on financial, technology and capacity building support needed and received in section 4.1. In terms of policy framework for climate finance mobilization, Malawi is guided by policy frameworks such as the Malawi 2063, the NCCMP, revised NDC and the NDC resource mobilization strategy.

Malawi's climate finance needs are informed by the revised Nationally Determined Contributions (NDCs). The country needs a total of US$41.8 billion for mitigation priorities, and US$4.5 billion for adaptation priorities, representing a combined funding requirement of over US$46.3 billion from 2020 through 2040. Of these amounts, US$24.6 Billion is required from external sources for mitigation actions, US $2.2 Billion for adaptation and US$0.753 Billion for cross-cutting climate action. During the reporting period, Malawi received an estimated US$ 0.875 Billion in climate financial support while a further US$2.17 Billion has been committed by different funding institutions.

Information on adaptation and mitigation technology support needed and received is described in sections 4.5 and 4.6 derived from the Technology Needs Assessment exercise of 2020. Technologies that were prioritized emanate from the following sectors: Energy, Forestry, Agriculture and Water. The most supported technologies during the reporting period include: Landscape restoration for improved land productivity; Solar PV Technology (both grid based and off-grid); Improved cook stoves and clean cooking; Early Warning Systems and Hazard Monitoring; Integrated Flood Management and Crop diversification for increased resilience.

Related to capacity building support needed and received, Malawi identified and prioritized three components of capacity building namely: individual capacity building, institutional capacity building and resource mobilization.

Finally, related to support needed and received for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity-building, Malawi has received support from three projects namely: Preparation of the First Biennial Transparency Report (BTR) and Fourth National Communication to the UNFCCC; Malawi Climate Transparency Framework under the Capacity Building Initiative for Transparency (CBIT) and Initiative for Climate Action Transparency – ICAT.

ES.5.1 Research and systematic observation

This section provides a general overview of the status of research and systematic observation in Malawi. Through the Department of Climate Change and Meteorological Services, Malawi participates in two Regional Climate Outlook Forums (RCOFs); Southern African Region COF (SARCOF) annually and South-west Indian Ocean COF (SWIOCOF) on invitation. At national level, observation stations are not adequate and well distributed limiting the functionality of climate observation. The country has developed a National Framework for Water and Climate

Services (NFWCS) to run from 2024 to 2029 with a total budget of USD 63,413,706 and will require external support.

ES.5.2 Gender and Climate Action

Regarding gender and climate action, climate change affects different gender categories differently. However, it has been observed that in Malawi, women tend to sell their assets in order to cope with climate impacts. Government has prioritized mmainstreaming gender in Natural Resources, Environment and Climate Change Management through the gender policy. In addition, at international level, Malawi signed up to the Lima Work Programme on Gender to promote gender balance and achieve gender-responsive climate policy.

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List of Abbreviations

AF	Adaptation Fund
AfDB	African Development Bank
AU	African Union
BoP	Balance of Payments
BTR1	First Biannual Transparency report
CBIT	Capacity Building Initiative for Transparency
CBO	Community Based Organization
CC	Climate Change
CCS	Carbon capture and Storage
CCUS	Carbon Capture, Utilization and Storage
CISONECC	Civil Society Network on Climate Change
COMESA	Common Market for East and Southern Africa
COP	Conference of Parties
CSA	Climate Smart Agriculture
c-Si	Crystalline Silicon
CTF	Common Tabular Format
CUNIMA	Catholic University of Malawi
DCCMS	Department of Climate Change and Meteorological Services
DCERCC	Development Cooperation Group on Environment, Resilience and Climate Change
DRM	Disaster Risk Management
ECHO	European Civil Protection and Humanitarian Aid Operations
EIB	European Investment Bank
ESB	Earth Stabilized Blocks
EU	European Union
EWG	Expert Working Group
EWS	Early Warning Systems
FAO	Food and Agriculture Organization
FCDO	Foreign, Commonwealth and Development Office
FLR	Forest Landscape Restoration
GCF	Green Climate Fund
GEF	Global Environment Facility
GETF	Green Economic Transition Facility
GFCS	Global Framework for Climate Services
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GoM	Government of Malawi
HDI	Human Development Index
ICAT	Initiative for Climate Action Transparency
IEA	International Energy Agency
IO	Indian Ocean
IPCC	Intergovernmental Panel on Climate Change
IRBM	Integrated River Basin Management
JICA	Japan International Cooperation Agency
KuHES	Kamuzu University of Health Sciences
LDC	Least Developed Countries

LDCF	Least Developed Countries Fund
LFG	Landfill Gas
LIFE-AR	Least Developed Countries Initiative for Effective Adaptation and Resilience
LPG	Liquefied Petroleum Gas
LUANAR	Lilongwe University of Agriculture and Natural Resources
MCA	Multi-Criteria Analysis
MIP-1	Malawi 2063 Implementation Plan 1
MIS	Management Information System
MoNRCC	Ministry of Natural Resources and Climate Change
MRV	Measurement, Reporting and Verification
MUBAS	Malawi University of Business and Applied Sciences
MUST	Malawi University of Science and Technology
MWASIP	Malawi Watershed Improvement Project
MZUNI	Mzuzu University
NC4	Fourth national Communication
NCCF	National climate Change Fund
NCCIP	National Climate Change Investment Plan
NCCMP	National Climate Change Management Policy
NDCs	Nationally Determined Contributions
NFWCS	National Framework for Water and Climate Services
NGO	Non-Governmental Organization
NORAD	Norwegian Agency for Development Cooperation
NSCCC	National Steering Committee on Climate Change
NTCCC	National technical Committee on Climate Change
OECD	Organization for Economic Cooperation and Development
PV	Photovoltaic
QC	Quality Control
RCOF	Regional Climate Outlook Forums
REDD+	Reducing Emissions from Deforestation and Forest Degradation, plus conservation, sustainable management of forests, and enhancement of forest carbon stocks
RHA	Rice Husk Ash
SADC	Southern Africa Development Committee
SARCOF	Southern African Region Climate Outlook Forum
SCCF	Special Climate Change Fund
SVTP	Shire Valley Transformation Programme
SWIOCOF	South West Indian Ocean Climate Outlook Forum
TF	Thin Film
UNDP	United nations Development Programme
UN CC: Learn	The One UN Climate Change Learning Partnership
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations Children's Fund
USAID	United Sates Agency for International Development
WB	World bank
WFP	World Food Programme
WMO	World Meteorological Organization
WtE	Waste to Energy

4 Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement

4.1 National circumstances, institutional arrangements and country-driven strategies

4.1.1 Systems and processes used to identify, track and report support needed and received

Mobilization of climate finance in Malawi is guided by the National Climate Change Management Policy - NCCMP (GoM, 2016), the National Vision through the MIP-1 (GoM, 2021a) and the updated Nationally Determined Contributions – NDC (GoM, 2021b). The NCCMP provides overall strategic direction for climate change management which includes climate finance.

In order to identify, track and report on support needed and received, Malawi has put in place different coordination and reporting mechanisms. As seen in Figure 4.1, Malawi's Institutional Framework for climate change coordination shows that the Cabinet Committee leads all climate work and enables all arms of government to coordinate their climate change actions. Below it is the Parliamentary Committee which serves to assist in lobbying for passing of environment related policies and legislations in the national assembly. This obligation includes oversight on climate finance needed and mobilized. Both committees work together with the Development Cooperation Group on Environment, Resilience and Climate Change (DCERCC).

Alongside the NDC, Malawi has also developed a resource mobilization strategy (May, 2022) with three main areas of action namely 1) institutional framework, 2) capacity building and enhanced capacities and 3) financing mechanisms and instruments. With support from Green Climate Fund (GCF), the government in consultation with various stakeholders, is in the process of establishing a National Climate Change Fund (NCCF). Once operational, the fund will be a single institutional framework that will act as basket for domestic and international resources and coordinating climate change funds. Further, a Finance Management Information System (MIS)[1] has been developed to track inflows of climate resources towards climate change related interventions by different stakeholders, including international NGOs; bilateral and multilateral institutions; development banks; United Nations programmes; academic institutions; the private sector and various non-state actors.

[1] https://www.ccfinancemw.com/

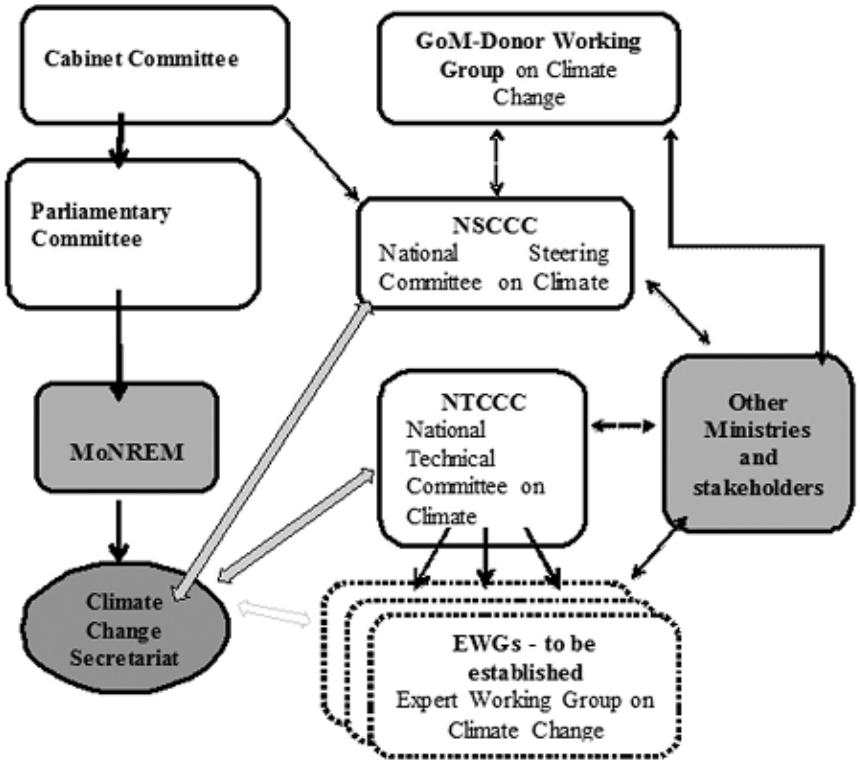

Figure 4.1: Coordination framework for CC Management in Malawi (Source: NCCMP)

4.1.2 Priorities and strategies on NDC under Article 4 of the Paris Agreement that need support

Under the updated NDC, Malawi revised the sectoral mitigation and adaptation targets up to 2040. The NDC demonstrates the commitment of the Malawi Government to meet its obligations towards addressing the challenges of climate change. The NDC articulates areas of priority for climate change management through both mitigation and adaptation measures needed to address challenges of climate change. Malawi has presented 115 measures in its NDC. Of these measures, 35 measures are related to mitigation while 80 measures relate to adaptation.

4.1.3 NDC measures that need support

Identified measures in the NDC that require support have been reported under section 4.3.1. It is worth noting that most of the financial support needs are reflected within the NDC framework.

4.2 Underlying assumptions, definitions and methodologies

4.2.1 Assumptions and definitions

The BTR1 covers the period from 1 Jan 2021 – 31 Dec 2023. The format of tables presented in the report was informed by the Common Tabular Formats (CTF) for the electronic reporting in Decision 5/CMA.3, but due to limited space in presenting tables in the chapter, selected columns were not illustrated in the chapter. This information for the columns not included in the chapter are included in the Common Tabular Formats (CTFs) for the relevant sections that supported the compilation of the chapter. Other assumptions and definitions for this chapter have been elaborated in Table 4.2.

4.2.1.1 Currency conversion

In this report, estimation to the USD equivalent has been done either using official agreement exchange rate or using historical data found on oanda website (https://www.oanda.com/currency-converter). Further, estimation of the Malawi Kwacha (domestic currency) provided has been done using 1146.94 Malawi Kwacha to 1 USD as an average exchange rate at the time of reporting (see Table 4.1). This is as provided by the Reserve Bank of Malawi (https://www.rbm.mw).

Table 4.1: Currency conversion for the reporting period

Currency	2021 (MWK)	2022 (MWK)	2023 (MWK)	2024 (MWK)	Average (2021-2024)
USD to MWK	800.13	930.41	1,134.53	1,722.78	1,146.96
EURO to MWK	945.98	1,001.57	1,281.29	1,921.09	1,287.48

The rest of the assumptions are outlined in Table 4.2 below:

Table 4.2: Assumptions and definitions

Item	Topic/issue	Assumption(s) made
1	Estimation of the amount of support needed	The amount of support needed has been estimated using national documents such as NDCs, NDC Resource Mobilization Strategy and National Climate Change Investment Plan (NCCIP) of 2013.
2	Determination of the reporting year or time frame	This report has covered support needed and received covering the year 2021 to 2022. This aligns with the revised NDC implementation period which commenced in 2021. Considering that most of the support provided is project based, apart from reporting on projects that started in 2021, this report has also included information on projects that started before 2021 but ended or extended beyond 2021.
3	Determination of support as committed or received	This report has determined support committed as that in which a funding institution has provided an award letter for or where an agreement is in place. Further, support is determined to be received if the amount has been moved by the donor to the recipient organization or MDA.
4	Identification and reporting of the status of the supported activity (planned, ongoing or completed	The activity is said to be planned if both the start and end date of the activity are in the future and the disbursements will not have started. For ongoing activities Implementation will have started and financial resources may or may not have been disbursed. Status is said to be completed if implementation is complete and the support disbursed fully.
5	Identification and reporting of the channel (bilateral, regional or multilateral)	The channel through which the support is provided is bilateral if the donor or development partner is a country or private company, and is multilateral if development partner is a UN Agency (e.g. UNDP) or multilateral bank (e.g. WB). The channel is regional if the support is coming from a regional body such as SADC, COMESA or Africa Union. It is worth noting that regional support also includes initiatives funded by a single donor or multilateral institution that covers different countries. In this report, such support has been classified as regional support.
6	Identification and reporting of the type of support	Projects or activities that will result in reduced GHG emissions have been considered as mitigation measures while those that will be taken to minimize the negative impacts of climate change have been considered as adaption measures. Those measures that will

	(mitigation, adaptation or cross-cutting)	have both mitigation and adaptation attributes have been considered as cross-cutting
7	Identification and reporting of the type of support by instrument (grant, concessional loan, non-concessional loan, equity, guarantee or other)	In this report (unless otherwise stated) grant, concessional loan, non-concessional loan, equity, guarantee and other have been defined as follows: **Grant:** Funds provided with no obligation to pay back for defined activities and within an agreed timeframe. These are either provided wholesome or in tranches. **Concessional loan:** Loans provided on terms substantially more generous than loans available on the market. **Non-concessional loan:** Loans provided at near or at market rates **Equity:** Finance available on the basis of gaining a share in the receiving entity with the right to receive a portion of the profits. **Guarantee:** A legally binding agreement under which the guarantor agrees to pay any or all of the amount due on a loan instrument in the event of non-payment by the borrower. **Insurance:** Insurance policies provide for the credit agency to re-imburse the lender for losses up to a certain percentage of the credit covered and under certain conditions. **Other:** Any other funding mechanism not aligned to any of the definitions above.
8	Identification and reporting of sectors and subsectors	Identification and reporting of sectors and sub-sectors has been guided by IPCC Guidelines and classification.
9	Reporting on the use, impact and estimated results of the support needed and received	The use, impact and estimated results of the support needed and received have been obtained from individual projects description which includes project objectives and results framework/theory of change.
10	Identification and reporting of the support as contributing to technology development and transfer and capacity-building	The primary objective of the activity has been assessed to see if it relates to technology development and transfer or capacity building or both.[2]
11	Measures to avoid double counting	In order to determine financial support coming from specific sources and to avoid double counting, an analysis of each of the projects and activities was done in order to separate amounts contributed by each funding source. Particular attention was paid to identifying names of projects, amounts of funding associated with each project and period of implementation and names of implementing agencies. This has been particularly done for multi-sectoral projects with different funding sources such as the Shire Valley Transformation Project (SVTP) and the Malawi Watershed Services Improvement Project (MWASIP) and others. Further, project or activity funding has been separated based on whether funding has been committed or received.

4.2.2 Methodologies used in compiling information in this chapter

In delivering this chapter the following steps were taken:

a. Reviewed relevant documents, including national climate action plans, reports, funding proposals and project documents.

[2] This is in line with both the Technology Needs Assessment report for Malawi and the 2021 Climate Change Learning Strategy

b. Engaged key stakeholders, including government ministries, department and agencies, international organizations, civil society groups, and private sector entities, to gather information on support needed and received.
c. Collected and analysed data on financial resources, technology development and transfer, and capacity-building support, including their sources, allocation, utilization, and impact.
d. Carried out Quality Control (QC) on the data using data from other sources such as OECD datasets and individual donor agencies particularly information published online. Links to this information have been provided.
e. Identified gaps, challenges, and lessons learned in accessing and utilizing the support, and recommend strategies for improvement.

4.3 Information on financial support needed under Article 9 of the Paris Agreement

4.3.1 Priority sectors for international climate finance

Malawi's climate finance and resource mobilization drives have historically faced insurmountable challenges which ultimately lead to climate finance gaps. Some of the issues that contribute to climate finance gaps include (i) the government of Malawi's heavy reliance on aid and international partners for financing development programmes and infrastructure, (ii) growing Balance of Payment (BoP) deficits due to an over-dependence on agriculture and tobacco as foreign currency earners, (iii) the limited involvement of private sector investment in environment and climate change activities, and (iv) high levels of informal economy which limits the scope of the government to collect taxes and initiate domestic resources mobilization strategies for climate change programmes.

Based on Malawi's circumstances, multi-lateral development banks such as the World Bank, the EIB and the AfDB are preferred due their attractive debt terms and the ability to unlock inflows from other sources. Priorities for climate financing for Malawi are in both adaptation and mitigation and have been defined in the NCIP and the revised NDCs. Table 4.3 below outlines prioritized sectors under which Malawi wishes to attract international climate finance.

Table 4.3: Priority sectors for international climate finance

Climate Action/Sector		**Source of funding**	
Mitigation		Bilateral	Multilateral
Sector	Activity		
Energy	Electricity Generation	✓	✓
	Transport		✓
	Buildings	✓	
	Agriculture		✓
Waste	Solid Waste		✓
	Wastewater		✓
Agriculture	Crop Management		✓
	Livestock		✓
Forest and Land Use		✓	✓
Adaptation			
Climate Services		✓	✓
Water	Drought Management	✓	✓
	Flood Management	✓	✓
	Integrated Watershed Management	✓	✓
Biodiversity & Ecosystems	Conservation of biodiversity	✓	✓
	Resilient Ecotourism		✓
Agriculture, Livestock and Fisheries		✓	✓

	Flood Proofing		✓
Human Well Being	Health	✓	✓
	Nutrition	✓	✓
	Social Support	✓	✓
Cross-cutting		✓	✓

4.3.2 Estimate of funding needed

Malawi needs substantial financial resources in order to achieve its ambition on climate as outlined the updated NDCs and other national policies on climate. Overall, Malawi needs a total of around US$41.8 billion for mitigation priorities, and US$4.5 billion for adaptation priorities, representing a combined funding requirement of over US$46.3 billion from 2020 through 2040. Detailed description has been provided in CTF III.6.

4.3.2.1 Mitigation

As shown in **Table 4.4** below, in order to achieve it ambition on mitigation, Malawi needs a total of US$24.6 Billion from external sources to complement un-conditional resources that will be raised domestically.

Table 4.4: Financial support needed (mitigation)

Mitigation activity, Programme, Project or Other (2020 – 2040)	Funding needed (US$M)	Is the activity anchored within the NDC?
Grid-connected hydropower generation	8300	Yes
Off-grid small scale solar PV systems	4	Yes
Grid connected large scale solar PV	1100	Yes
Grid connected wind power	479	Yes
Clean Coal technology - high efficiency coal-fired power plant	7500	Yes
Clean Coal technology - Carbon Capture and Storage (CCS)	4800	Yes
Modal shift: private to passenger transport	97	Yes
Modal shift: road to rail freight	6.45	Yes
Increasing ethanol blending with gasoline as a transportation fuel	253	Yes
Blending biodiesel with diesel as a transportation fuel	16	Yes
Increased use of rice husk ash (RHA) in blended cement	3	Yes
Earth stabilized blocks (ESBs) as building materials	1	Yes
Sustainable forest and landscape management	549	Yes
Alternative low carbon cement processes	1	Yes
Support industries involved in carbon capture utilization and storage	1	Yes
Landfill gas (LFG) utilization	102	Yes
Waste to Energy (WtE)	169	Yes
Waste-water treatment and reuse	67	Yes
Promotion of efficient fertilizer use and manure management	221	Yes
Improved rice management practices	100	Yes
Improved livestock husbandry	72	Yes
Improved livestock and breed management	700	Yes
Improved farm management	39	Yes
Total	**24,580**	

4.3.2.2 Adaptation

In terms of adaptation, Malawi will require approximately US $2.2 Billion through 2040 in order to achieve its ambition (see Table 4.5).

Table 4.5: Financial support needed (adaptation)

Adaptation Activity, Programme, Project or Other (2020 – 2040)	**Funding needed (US$ M)**	**Is the activity anchored within the NDC?**
Community-based EWS and flood monitoring in problematic rivers	180	Yes
Designing, testing, and executing multi-hazard contingency plans	100	Yes
Integrating DRM risk assessment and monitoring in all sectors	20	Yes
Water supply, storage, harvesting in drought-prone areas	54	Yes
Construction of multipurpose dams for water storage	90	Yes
Integration of indigenous knowledge into EWS for drought	11	Yes
Planning, construction, and improvement of flood management structures such as upstream dams, storm drains, dikes, and bunds	151	Yes
Delineation of flood prone areas with flood zoning maps and the development of appropriate adaptation strategies and measures	90	Yes
Extension of the installation of telemetry flood forecasting and warning systems to other flood prone areas	54	Yes
Development and strengthening of water policies, integrated land use management plans in priority watersheds and reservoirs	25	Yes
Increase sustainable utilization & monitoring of groundwater resources	20	Yes
Improvement in the coverage of rural piped water supply	55	Yes
Development of nationwide water quality monitoring framework systems	25	Yes
Promotion of cooperation with regional and international institutions in the conservation and management of wildlife resources	15	Yes
Provision of watering points at strategic locations of national parks	30	Yes
Upscaling of measures for controlling the extinction of plant & animal species	50	Yes
Management of elephant population & implementation of diseases' control	50	Yes
Development & implementation of tourism support infrastructure plan	7	Yes
Development of a tourism crisis management strategy and plan	9	Yes
Improvement of tourist facility/buildings designs	18	Yes
Membership of the Climate Change Crisis Committee	18	Yes
Mainstreaming climate change adaptation in tourism investment plans	8	Yes
Institute and upscale drought mitigation interventions	35	Yes
Mechanize agricultural production with support to smallholder farmers	60	Yes

Establish grain export processing zones & develop resilient value chains	15	Yes
Crop and diet diversification through the cultivation of roots and tubers	12	Yes
Promotion of legumes and other multiple impact crops for soil fertility improvement and dietary improvement	30	Yes
Promotion of various drought-resilient water, soil and catchment conservation interventions on and off-farm	20	Yes
Instituting and upscaling drought mitigation interventions such as the development of new irrigation schemes	20	Yes
Introduction, expansion, & scale-up of CSA practices	20	Yes
Crop/livestock and fish farming intensification & diversification	30	Yes
Expand Greenbelt initiative	30	Yes
Strengthening of farmer organizations and market engagement	20	Yes
Restocking strategic grain reserves	20	Yes
Up-scaling feed preservation & fodder banks	12	Yes
Improving agricultural value-addition through agro-processing	15	Yes
Improving infrastructure in agricultural value chains	20	Yes
Provision of agricultural input subsidies & incentives	5	Yes
Promotion of drought tolerant or early maturing planting material	10	Yes
Constructing water reservoirs & efficient use of water	26	Yes
Soil management techniques to improve soil fertility and soil conservation	10	Yes
Minimizing hard landscaping materials which absorb heat during the day and re-radiate it at night	15	Yes
Application of ventilation and cooling strategies	8	Yes
Application of drought management in the design, construction and management of public and private infrastructure	67	Yes
Applying safety and build better and smarter principles	100	Yes
Revision of existing building standards	90	Yes
Conducting slope stability studies to reduce incidents of landslides	30	Yes
Construction of offshore breakwaters, groins to protect shorelines	30	Yes
Increase practices of boiling drinking water, filtration and chlorination of drinking water and improvement in personal hygiene	15	Yes
Enhance public awareness about water, sanitation & hygiene practices	15	Yes
Enhance health surveillance of Malaria, Diarrhea and Malnutrition	20	Yes
Promotion of insecticide-treated mosquito nets		Yes
Increase adoption of oral rehydration salts	15	Yes
Conducting of nutrition assessment, counselling, and support services	20	Yes
Promotion of dietary diversity & integration of nutrition-sensitive practices	15	Yes
Promote nutrition-specific practices	25	Yes

Preparation of long-term workforce development plans	25	Yes
Establishment of Social Support Fund for predictable, timely response (Climatic shock related Social Protection services)	80	Yes
Linkage of inclusive social support systems to risk financing options	35	Yes
Strengthen governance	90	Yes
Total	**2,185**	

4.3.2.3 Cross-cutting

An analysis of the funding needed shows that US$0.753 Billion is needed to implement cross – cutting measures (see Table 4.6).

Table 4.6: Financial support needed (cross-cutting)

Cross-cutting Activity, Programme, Project or Other (2020 – 40)	**Funding needed (US$ M)**	**Is the activity anchored within NDC?**
Agroforestry	6	Yes
Conservation agriculture: crop residue incorporation and rotation	236	Yes
Conservation agriculture: conservation tillage	1	Yes
Afforestation (protective forests, woodlots and urban forests)	480	Yes
Promotion of drought-resilient water, soil and catchment conservation through farmer-managed natural regeneration	30	Yes
Total	**753**	

4.4 Information on financial support received under Article 9 of the Paris Agreement

During the reporting period, a total of US$3.045 Billion was either committed or received by Malawi for various projects and programmes in different sectors. However, only US$ 0.875 Billion was actually received. This represents 29% of the total funding earmarked for climate action (see Figure 4.2)

Detailed description of financial support received has been outlined in CTF III.7.

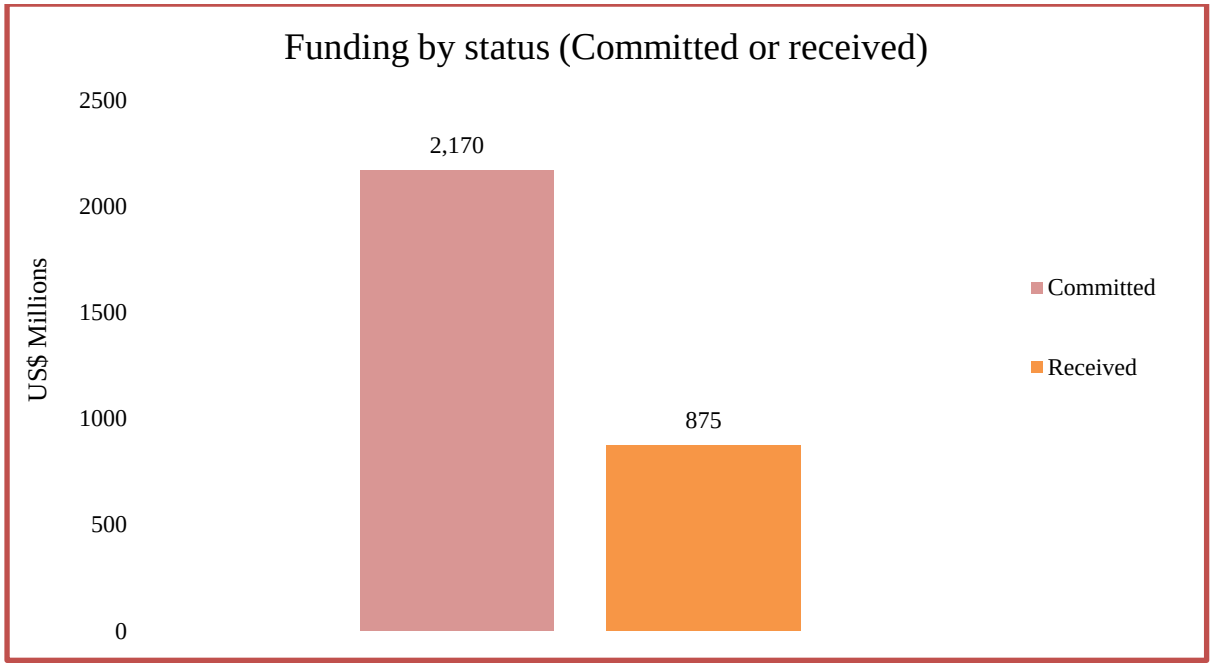

Figure 4.2: Funding committed or received

A total of US$ 1.7 Billion (either committed or received) was allocated to adaptation representing 56% of the committed or received funding. Cross-cutting and mitigation funding amounted to US$0.72 Billion and US$ 0.6 Billion respectively (see Figure 4.3)

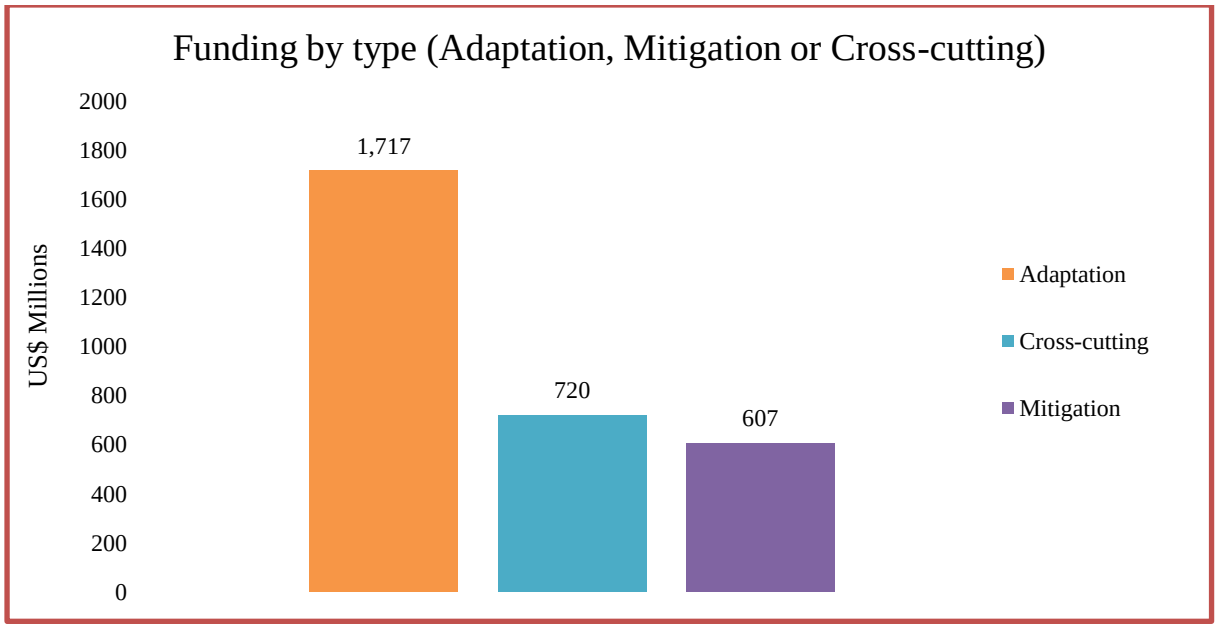

Figure 4.3: Funding by type (adaptation, cross-cutting or mitigation)

Out of the total funding committed or provided, US$ 0.5 Billion was for projects or activities that have been completed, US$1.436 Billion for on-going activities while US$1.1 Billion is for planned activities.

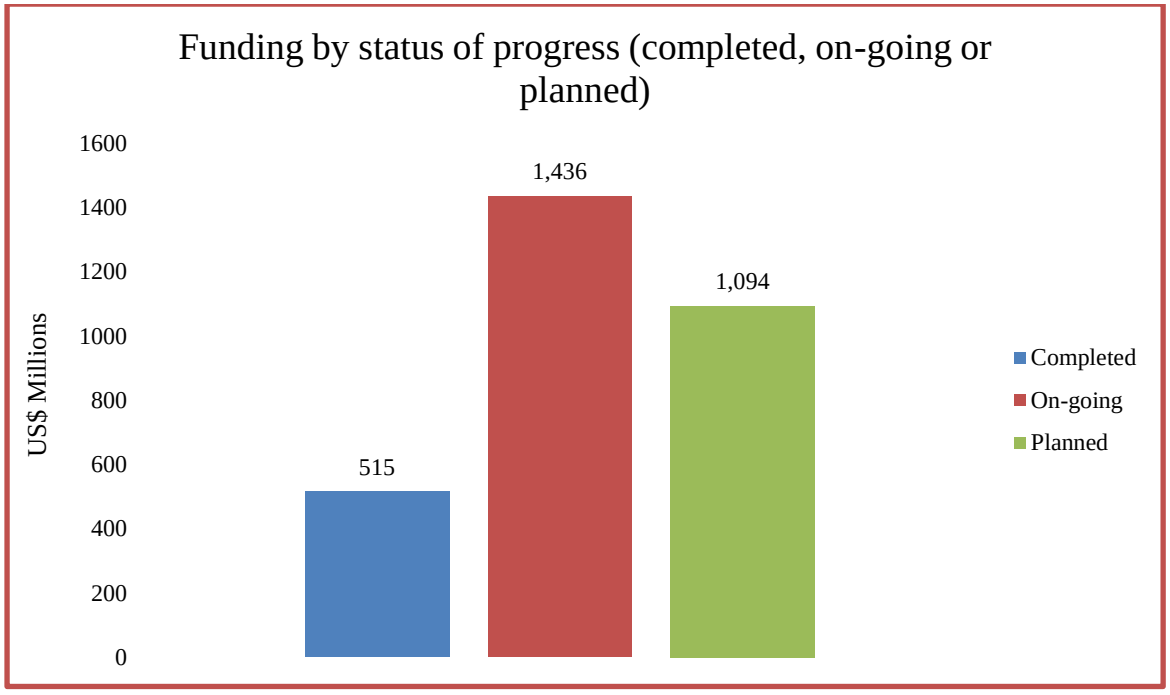

Figure 4.4: Funding by status of activities (completed, on-going or completed)

Grant funding constituted a bigger proportion of funding committed or received (i.e. 67%). Further, 33% of the funding is a combination of a grant and another financial mechanism (concessional loan or guarantee). Only 0.6% has been recorded as a concessional loan.

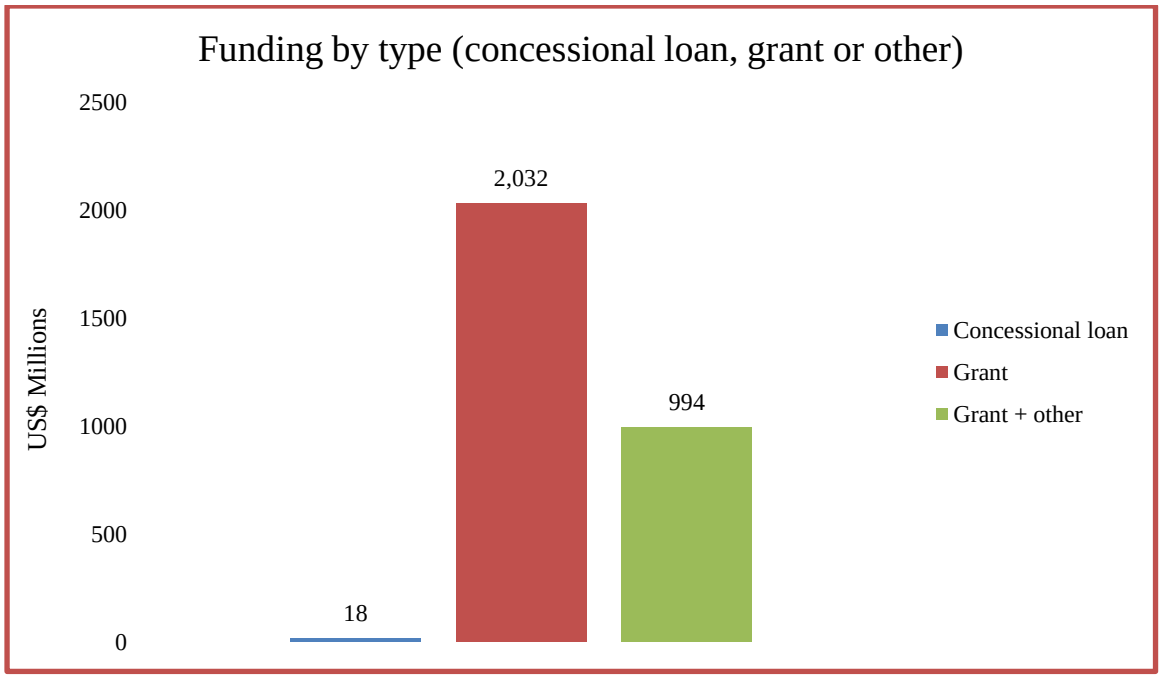

Figure 4.5: Funding received by type (concessional loan, grant or other)

4.5 Information on technology development and transfer support needed under Article 10 of the Paris Agreement

4.5.1 Plans, needs and priorities related to technology development and transfer

Malawi underwent a Technology Needs Assessment exercise targeting adaptation and mitigation in 2020[3]. Climate adaptation and mitigation technologies for key sectors were identified and taken through the prioritization process using a participatory Multi-Criteria Analysis (MCA). These sectors include agriculture, water, energy and forestry. A gender responsive approach was mainstreamed in the prioritisation process through inclusion of gender-related criteria to help prioritise climate technologies that could contribute to promotion of gender equality and economic empowerment of women and girls. In each sector, the top climate adaptation and mitigation technologies were selected. These technologies are presented in Table 4.7

Table 4.7: Priority technologies for climate adaptation and mitigation across sectors

Sector	Key technologies prioritized	Description of the technology	Related needs for the enhancement of endogenous capacities
Energy	Promotion of liquefied petroleum gas (LPG) for household cooking	As a cooking fuel, LPG is seen by the International Energy Agency (IEA) as one of the plausible main means for moving away from unsustainable use of biomass for cooking. The Malawi Government also identified it as one way of reducing deforestation.	Awareness raising on LPG as a cooking fuel as well as improvement in the gas storage and distribution networks in the country.
	Promotion of biofuel as vehicle fuel	Biofuels are fuels produced directly or indirectly from organic material including plant materials and animal waste. Biofuel used in the transport sector could be fuel grade ethanol and biodiesel from energy crops such as sugar cane and Jatropha respectively. Fuel grade Ethanol is blended with petrol at blending ratios of 20:80.	Further research needs to be supported on possibility of higher blending ratios between ethanol and petrol. Further, there is need for increased production of raw materials used for production of ethanol and bio-diesel.
	Biomass gasification technology	Biomass gasifiers are energy systems that generate combustible gas (syngas) from solid biomass (any solid carbonaceous material) through series of thermo-chemical processes. The advantage of biomass gasification is that using the syngas is potentially more efficient than direct combustion of the original biomass because syngas can be combusted at higher temperatures or even in fuel cells so that the thermodynamic upper limit to the efficiency defined by Carnot's rule is higher. The syngas could be used in fuel cells and internal combustion engine.	Support for local institutions that are developing the technology such as Chitedze Agricultural Research Institution and at Jesuit Centre for Ecology and Development.

[3] https://tech-action.unepccc.org/country/malawi/

	Lake Malawi hydrokinetic electric power technology	Enormous electricity could be produced from hydrokinetic power extracted from Lake Malawi. From science, due to boundary layer phenomenon, the velocity of water flow increases from the lake bed with height until reaching the maximum velocity, and then it decreases unto to the water surface. It is thus, possible to place a turbine at a position of maximum water flow velocity to harness maximum hydrokinetic power.	Support for further research on the feasibility of the technology.
	Promotion of improved charcoal production kilns	Improved charcoal production kilns have the potential to increase production efficiency of charcoal reducing wastage of biomass.	Capacity building for licensed charcoal producers on the technology.
	On-grid and off-grid Solar PV Technology	Solar photovoltaic (PV) cells convert sunlight directly into electricity. Currently, crystalline silicon (c-Si) and the thin-film (TF) technologies dominate the global PV market. In a c-Si PV system slices (wafers) of solar-grade (high purity) silicon are made into cells that are assembled into modules and electrically connected. TF PV technology consists of thin layers of semiconducting material deposited onto relatively inexpensive, large-size substrates such as glass, polymer or metal.	Capacity building for local companies to assemble and install Solar PV technology
Forestry	Forest landscape restoration	Forest landscape restoration (FLR) is the process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes. FLR is more than just planting trees – it is restoring a whole landscape to meet present and future needs and to offer multiple benefits and land uses over time	Preservation of indigenous species of trees and other plants utilizing local knowledge systems in combination with scientific knowledge.
	Efficient use of forest products	A forest product is any material derived from forestry for direct consumption or commercial use, such as wood, timber and poles. Wood by far the dominant product of forests in Malawi, is used for many purposes, such as source of energy (e.g. in form of firewood and charcoal), and as materials for construction (timber for construction).	Engagement of local artisans and other forest users as stakeholders in forest management.
	Urban forestry	Urban development results in the depletion and degradation of natural trees and forests in and around urban areas causing loss of vital ecosystem services and, potentially, rendering little resilience to disasters, such as those from climate change impacts. As Malawi continues to urbanize, with insufficient and or	Capacity building on land use planning and development of urban green spaces with emphasis on urban forestry.

		absence of strategic planning, it will result in unsustainable patterns of land use, which could exacerbate the mentioned challenges.	
Agriculture	Landscape restoration for improved land productivity	A technology of regaining ecological functionality across deforested or degraded landscapes.	This technology requires sufficient local capacity building in addition to continued extension support for sustained adoption.
Agriculture	Integrated crop-livestock-aquaculture-forest production systems	a technology which integrates four different production systems within the same area or farmland in order to maximize its production capacity. The interaction between the production systems generates mutual benefits. In addition, a diversified portfolio of production systems ensures increased resilience of the farming households from climate variability and changes.	This technology requires sufficient local capacity building in addition to continued extension support for sustained adoption.
Agriculture	Community based agricultural extension	A technology based on the idea of providing specialized and intensive technical training to 1 or 2 people in a community who then promote a variety of appropriate technologies and provide technical services with occasional support and review from a supporting organization	Initial local capacity building is required supplemented by backstopping support from frontline agricultural extension agents
Water	Rainwater harvesting	A technology through which rainwater is captured from manmade surface catchments such as rooftops, and road drainage and culverts, and stored in reservoirs or storage tanks for use during dry periods	Capacity building for local artisans to manufacture and install water harvesting equipment.
Water	Integrated river basin management (IRBM)	IRBM is an approach of looking at the whole river basin at a time, understanding different components of the basin, and manipulating how these can work together in order to sustainably supply water for different types of uses in the face of climate change.	Capacity building for local communities to understand the technology and related benefits.
Water	Integrated flood management	An integrated technology to flood management. It integrates land and water resource development in flood-prone areas and aims to minimize damages and losses associated with floods, and maximize the net benefits from the use of alluvial-rich soils of the floodplains for farming.	Capacity building for local institutions and communities on flood hazard mapping, flood proofing of critical infrastructure and provision of early warning information systems.

4.6 Information on technology development and transfer support received under Article 10 of the Paris Agreement

Malawi has received technology development and transfer support from a number of bilateral, regional and multilateral mechanisms as outlined in CTF III.9. Table 4.8 below outlines common technologies that have been supported including how the technology is contributing

to enhancement of endogenous capacities and know how as well as the stage of technology development and transfer.

Table 4.8: Supported technologies and how they enhance endogenous capacities

Technology development and transfer support received	**Type of technology**	**How support contributes to technology development and transfer, endogenous capacities and know-how**	**Stage of the technology cycle supported**
Malawi Watershed Services Improvement Project (MWASIP) – CTF TableIII.7 TITUKULANE Food Security and Resilience Project - CTF TableIII.7 Building community and ecosystem resilience through livelihood improvement and rehabilitation of badly degraded areas - CTF TableIII.7 Sustainable Management of Landscapes (SAMALA) - Flanders and Ireland - CTF TableIII.7 Climate Resilience Initiative in Malawi (CRIM) Project I - CTF TableIII.7 Malawi Resilience and Disaster Risk Management Project (MRDRMP) - CTF TableIII.7	Landscape restoration for improved land productivity	The project provides training on proven and locally developed SLM technologies to restore degraded landscapes and increase land productivity. These include physical and biological soil and water conservation techniques (contour ridging, box ridging, infiltration ditches, gully reclamation, vetiver hedgerows, vegetative river/stream-bank protection etc.)	Deployment – climate friendly SLM technologies are being promoted within communities using a catchment management approach
Increased Access to Clean and Affordable Decentralized Energy Services in Selected Vulnerable Areas of Malawi - CTF TableIII.7 Africa Mini grids Program - Malawi - CTF TableIII.7 Malawi Energy Programme - Wala Malawi - TableIII.7	Solar PV Technology	Scaling up and strengthening Malawi's first mini-grid, independent and vertically integrated energy company operated as a social enterprise; provide micro-capital grants and pilot innovative service arrangements for clean energy mini grids. By setting up a social enterprise to operate 168kWP generated from Mini grids at Lujeri Estate local capacity is enhanced. Further, this project is training at least 300 people on how to	Research, development and dissemination

		operate a minigrid with 28 districts covered by clean energy Mini grids training programmes.	
Modern Cooking for Healthy Forests in Malawi - CTF TableIII.7 Accelerating Alternative Energy and Fuel Efficient Techologies through the Green Economic Transition Facility - CTF TableIII.7	Improved cook stoves and clean cooking	This intervention supports accelerated adoption of clean cooking technologies through inclusive and sustainable business and entrepreneurship opportunities. Locally developed cooking technologies and fuels are being promoted under this programme in order to address deforestation.	Diffusion
Transformational Adaptation for Climate Resilience in Lake Chilwa Basin of Malawi (TRANSFORM) - TableIII.7	Early Warning Systems and Hazard Monitoring	This intervention is reducing vulnerability and increasing resilience through innovation and technology transfer in EWS and Hazard Monitoring around Lake Chilwa Basin. Building on indigenous climate knowledge, communities within the basin are developing early warning information and adapatation strategies that incorporate both science and local knowledge	Diffusion

Box 4-1: Case Study 1: Scaling up the use of Modernized Climate Information and Early Warning Systems in Malawi (M-CLIMES) Project

Scaling Up the Use of Modernized Climate Information and Early Warning Systems in Malawi (M-CLIMES) Project funded by the Green Climate Fund supports Government of Malawi (GoM) to take steps to save lives and enhance livelihoods at risk from climate-related disasters. It addresses technical, financial, capacity, and access barriers related to weather and climate information (CI) by investing in enhancing hydro-meteorological capacity for early warnings (EWs) and forecasting, development and dissemination of tailored products including for smallholder farmers and fishers, and strengthening capacities of communities to respond to climate-related disasters. The objective of the project is to reduce vulnerability to climate change impacts on lives and livelihoods, particularly of women, from extreme weather events and climate change. The expected key Fund level impact is increased resilience and enhanced livelihoods of the most vulnerable people communities and regions. The primary measurable benefits include approximately 1.4M direct and 0.7M indirect beneficiaries (total 12% of the population) who will gain access to critical weather information.

The M-CLIMES project has registered significant progress since its conception and achieved the project goal of reaching an estimated 2 million people with lifesaving early warnings and severe weather advisories through improved monitoring, packaging and dissemination of tailored climate information that can save lives and protect livelihoods. The installation of additional hydro-met equipment and systems, including automated weather stations, automated hydro stations, lake based weather buoys, lightning detection and warning systems and weather data integration systems, has improved the hydromet observation network in Malawi. Similarly, the training of hydromet staff in operation and maintenance, data modelling and improved forecasting has improved the accuracy of weather forecasts and related climate services. Seasonal and short-term agro-weather information and advisories for small-holder farmers have been produced and disseminated to more than 500,000 (53% women) smallholder farmers across 14 districts via PICSA (Participatory Integrated Climate Services for Agriculture) approach using the national agriculture extension network and the Agro weather SMS dissemination Platform. More than 300,000 people (over 30% female) in fishing communities in 4 lakeshore districts have been reached with regular weather and safety advisories through various media including community radio programs and awareness campaigns. The Telemetry Community Based Flood Early Warning System continue to provide live saving advance flood warnings to over 175,000 people (over 50% women) across eight flood prone districts. A comprehensive community-based flood preparedness program in the flood prone communities has helped the communities to implement a set of preparedness and preventive actions to save lives and livelihoods.

Box 4-2: GETF has increased national LPG storage capacity

Figure 4.6: LPG storage facility for 265 Energy supported by GETF (Photo credit: GETF Project)

The Green Economic Transition Facility (GETF) is a competitive and transparent business support facility partnering with companies willing to invest and, or diversify into green business solutions. The first window of the facility, 'Accelerating Alternative Energy and Fuel-Efficient Cooking Technologies' with support from Irish Aid, supports companies to assist households in urban and peri-urban centers of Malawi transition to alternative energy and fuel-efficient technologies which includes LPG for cooking reducing their reliance on illegal charcoal for cooking and resulting in decreased deforestation. Through the facility, four companies namely 265 Energy, Gasman, Blue Waves and Mount Meru are increasing the supply of LPG in urban and peri-urban areas to ensure sustained access of the product for cooking in place of illegal charcoal. Through their combined efforts, national LPG storage capacity has more than doubled from 50 tonnes original capacity to 128 tonnes as new capacity. This is expected to ensure sustained supply of LPG and increased adoption of the technology.

4.7 Information on capacity-building support needed under Article 11 of the Paris Agreement

4.7.1 Malawi's capacity-building needs, constraints and gaps related to CC

Malawi has prioritized three areas for capacity building support in order to achieve its vision of a knowledge-driven climate change resilient country by 2030, pursuing a low carbon development pathway in line with the National Climate Change Management Policy of 2016 as outlined in its 2021 climate change learning strategy (GoM, 2021c). The prioritized areas have been outlined in CTF III.10 and relate to the following components:

4.7.1.1 Individual capacity building

Malawi has made tremendous progress in improving human resources capacity in terms of raising awareness and building knowledge and skills to design, develop and implement climate change adaptation and mitigation programmes, projects and activities. Despite this progress, a lot more work needs to be done in creating awareness of climate change issues by the general public, in both urban and rural areas; and increasing numbers and improving the range of skills to address current and emerging climate change challenges. In terms of CC learning content, the individual learning needs vary from basic, intermediate to advanced knowledge and skills. The following priority actions were selected in order to address the identified needs and gaps under Individual learning and skills development:

- Developing innovative national climate change awareness raising programmes to meet the needs of diverse stakeholders;
- Training lead trainers from key stakeholder groups (CISONECC, Faith Based Organizations, Association of Environmental Journalists, Youth Groups, Women Groups) about climate science, adaptation, mitigation, policy and negotiation;

- Developing training of trainers' programme for Agricultural Extension Officers and Lead Farmers to impart knowledge of climate smart agriculture (CSA) to farming households; and
- Training government professional officers at national and district levels, policy makers and parliamentarians in basic knowledge of climate change science, impacts of climate change on sustainable development, CC financing, governance and negotiation.

4.7.1.2 Institutional capacity building

Environmental Affairs Department in the Ministry of Natural Resources and Climate Change (MoNRCC) is the National Focal Point on climate change issues. The establishment of a dedicated department is one of the greatest boosts in the institutionalization of climate change programmes, projects and activities in Malawi. The Department plays a leading role in climate change learning, through the Steering Committee on Climate Change and the Technical Committee on Climate Change, urging ministries/departments to continue support positions of Climate Change Desk Officers. Furthermore, the Strategy on Climate Change Learning targets primary and secondary schools, higher education institutions, community colleges, technical institutions, NGOs, CBOs CISONECC, Association of Environmental Journalists, and business associations to spearhead climate change training and awareness initiatives. Although Malawi has a number of institutions involved in climate change issues, none of them is wholly dedicated to climate change training, research and awareness. The following priority actions were selected for institutional capacity building in Malawi:

- Reviewing and updating curricular on climate change at primary and secondary schools
- Mainstreaming climate change learning in existing curricular at tertiary education institutions (e.g. University of Malawi, Malawi University of Science and Technology (MUST), Mzuzu University (MZUNI), Lilongwe University of Agriculture and Natural Resources (LUANAR), Kamuzu University of Health Sciences (KuHES) and Catholic University); and
- Developing and/or strengthening infrastructure for climate change learning (classroom space, E-learning facilities, National Library Services and Academic libraries, Climate Centers, etc.).

4.7.1.3 Resource mobilization

The main thematic areas for climate change learning strategy in Malawi relate to individual learning needs and institutional capacity building. It has however been noted that in order to effectively implement various activities associated with these two main pillars, it will be absolutely necessary to source adequate financial resources. It is in light of the above that stakeholders and participants at the two National Workshops (Please mention them) strongly supported the idea of coming up with a third pillar, financing, so that appropriate strategies could be developed to ensure sustainable funding for climate change in general, and CC learning activities in particular. In 2013, the Government developed and launched the National Climate Investment Plan to provide potential investors and funders a basket of prioritised investment projects in which the Government was looking for potential partners to support and invest. Priority actions have been developed to address financing gap. The following priority actions were selected under this priority area:

- Developing human resource capacity with knowledge and skills to develop fundable project proposals for local and international sources;
- Mobilizing local resources for Climate Change learning; and
- Mobilizing international resources for Climate Change learning.

4.7.2 Processes for enhancing public awareness, public participation and access to information in relation to capacity-building

Malawi has implemented a number of processes for enhancing public awareness, public participation and access to information in relation to capacity building as outlined below:

4.7.2.1 Strengthening the National Youth Network on Climate Change (NYNCC)

The National Youth Network on Climate Change (NYNCC), founded in 2011, has been working with the Government of Malawi in advancing the voice of the youth on the climate change management agenda in the Country. However, in the absence of enabling strategic frameworks, their efforts were not coordinated amongst their membership and with stakeholders. As a youth network which has a great passion for climate change issues in the country, the Network needs to have an established ground for continuous improvement in its performance. In order to strengthen the network, support has been provided under the UN:CC Learn Programme to develop a strategic plan and to establish an online platform that will allow information sharing on climate.

4.7.2.2 Establishing Malawi Higher Education Institutions Network on Climate Change Learning (MHEINCCL)

Having identified gaps in coordination mechanisms among Higher Education Institutions in climate change learning in the country, the project facilitated establishment of the Malawi Higher Education Institutions Network on Climate Change Learning (MHEINCCL). The main objective the MHEINCCL is to champion climate change learning in Higher Education Institutions (HEIs) in Malawi and beyond. Specifically, the Network intends to:

i. Expand interest for CC learning among HEIs in Malawi and beyond;
ii. Influence decision-making towards investments in CC learning in Malawi and in the region;
iii. Represent HEIs in high level national committees on CC;
iv. Promote CC learning activism among HEIs in Malawi;
v. Advance CC learning and related research among HEIs in Malawi and beyond;
vi. Provide technical and academic support and advice on CC learning related issues among various stakeholders; and
vii. Attend to any other issues related to CC learning of interest to HEIs that arise from time to time.

4.8 Information on capacity-building support received under Article 11 of the Paris Agreement

Malawi has received varying support on capacity building. This has been outlined in CTF III.11. Key highlights of support provided include the following:

- Building capacities of civil society organizations to improve the quality of GCF proposals submitted and enabling participatory monitoring of GCF projects
- Building the capacity of national and district level authorities to improve DRM, with the objective of reducing future hazard impacts and ensuring effective humanitarian response.
- Facilitating participation of youth in climate change impact mitigation through establishment of community youth led enterprises in waste management.

Box 4-3: Support for Climate Change Learning in Malawi by UN CC:Learn

Malawi faces high climate variability and an increasing number of extreme weather events. Since 2012, UN CC:Learn has been working with the government of Malawi and other stakeholders in the country to design and implement a strategic and results-oriented approach to climate change learning. Together with the Government of Malawi and key stakeholders, UN CC:Learn facilitated the development the country's first national climate learning strategy, which was launched in 2013 and in 2021, the strategy was updated using a multi-stakeholder and cross-sectoral approach. The updated strategy sets out a number of objectives including the following:

- Developing a critical mass of human resources with the requisite understanding, knowledge and skills to respond to the impacts of climate change,
- Strengthening the national institutions and systems that will spearhead climate change training initiatives, and
- Developing a sustainable financing mechanism for climate change learning programmes.

4.9 Information on support needed and received for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity-building

Malawi needed and has received varying support for the implementation of Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity building. All the support has been provided through multi-lateral institutions and is on-going.

Table 4.9: Support received in the implementation of Article 13 of the Paris Agreement and transparency-related activities

Title of activity/ programme/project	Objectives and description	Use, impact and estimated results	Amount ($)
Preparation of BTR1 and NC4 to the UNFCCC	This project objective is to support Government of Malawi prepare and submit the First Biennial Update Report (BTR1) and the Fourth National Communication to the United Nations Framework Convention on Climate Change (UNFCCC).	BTR1 and NC4 reports submitted to UNFCCC. In addition, different stakeholders (including private sector) participate in the transparency initiative through provision of data	566,115
Malawi Climate Transparency Framework under the Capacity Building Initiative for Transparency (CBIT)	The objective of the project is to establish or strengthen national capacity to track progress on national commitments made under the Paris Agreement and also to prepare comprehensive and accurate reports capturing their implementation in the medium to long-term.	Among others the project will ensure that: 1) Malawi's institutions effectively collaborate to track and report Greenhouse Gas (GHG) emissions, climate actions and support needed and received; 2) Stakeholders use the data management platform to support the MRV system; 3) The climate	1,156,320

		transparency unit, relevant sector institutions and stakeholders perform their roles in the MRV system on a continuous basis	
Initiative for Climate Action Transparency – ICAT	The project objective is to enable Malawi to manage and track the implementation of its NDC mitigation actions by putting in place a framework for regular collection and management of the necessary data		166,306

4.10 Conclusion

Malawi is committed to report transparently its climate action and support (needed and received) in line with transparency related goals of the Paris Agreement. In reporting financial, technology development and transfer and capacity building support needed and received, Malawi is guided by national institutional and policy frameworks such as the Malawi 2063, the NCCMP, revised NDC and the NDC resource mobilization strategy with the National Adaptation Plan currently under development.

Malawi has determined that it needs a total of US$41.8 billion for mitigation priorities, and US$4.5 billion for adaptation priorities, representing a combined funding requirement of over US$46.3 billion from 2020 through 2040. Of these amounts, US$24.6 Billion is required from external sources for mitigation actions, US $2.2 Billion for adaptation and US$0.753 Billion for cross-cutting climate action. During the reporting period, Malawi received an estimated US$ 0.875 Billion in climate financial support while a further US$2.17 Billion has been committed by different funding institutions.

5 Information to be reported when national communications and biennial transparency reports are submitted jointly every four years

5.1 Status of climate change research and systematic observation

Malawi through the Department of Climate Change and Meteorological Services participates in two Regional Climate Outlook Forums (RCOFs); Southern African Region COF (SARCOF) annually and South-west Indian Ocean COF (SWIOCOF) on invitation. These are mainly active during the approach of rainfall season: SARCOF is for the Southern African Development Community (SADC) countries; SWIOCOF is for Indian Ocean (IO) islands (Comoros, Madagascar, Mauritius, Reunion, Seychelles) and IO west coast countries (Mozambique and Tanzania).

Regionally, meteorological services in the SADC are linked through the SADC Climate Services Centre (located in Botswana). Its coordination capability is not very strong and has so far dealt with weather/ seasonal forecasting issues and network expansion and management. Additionally, the forums do not include formal arrangements for data sharing and human capacity building.

5.1.1 Gaps in meteorological, atmospheric and oceanographic research and observation in Malawi

Observation and monitoring imply the examination of the state of the earth's atmosphere and its underlying surface in a particular area at a particular time of the day by using instruments and eyes within a given short period of time. Hydro meteorological observation and monitoring in Malawi comprise systems such as automatic weather stations, conventional meteorological stations, automatic and manual hydrological monitoring stations and lake-based buoys on Lake Malawi; while upper air observations include use of accessible satellite imagery and upper air balloons. The use of the latter is limited by resources.

In Malawi, the observation stations are not adequate and well distributed over the national territory. There are 21 principle meteorological conventional stations which observe full range of weather elements including temperature, wind speed and direction, rainfall, sunshine hours, cloud cover, visibility, humidity and atmospheric pressure. These are also working as climatological stations supported by 21 subsidiary agro-meteorological stations, over 400 rainfall stations and over 81 Automatic Weather Stations. Some of the subsidiary Agro meteorological stations are no longer operational due to other factors. Currently, there is no upper air observation station and weather radar, and there is only one satellite observation station.

An ideal situation would be to have a station covering a radius of about 20km in flat areas and smaller radius in hilly areas. Although this is the ideal situation, a minimum of one station per district would be very useful to improve the spatial resolution. The 21 full meteorological stations available are representing wider areas, thereby affecting precision and reliability of the data. Furthermore, data transmission to the responsible departments is not automated and the availability of data capturing staff is not adequate. There is also no backup for the data management system available. As such, this increases data backlog and risk of losing data. Meanwhile, the use of various types of rain gauges in the rainfall stations affects the quality and comparability of data, because installation of rain gauges is not fully regulated. There is need therefore to procure and install additional conventional and Automatic Weather stations and to adequately service them. It is also recommended that on installation of rain gauges and other observation equipment by stakeholders, regulations and standards be implemented and that Department of Climate Change and Metrological Services (DCCMS) approves the rain

gauges to be used and that distribution is regulated. There is need to improve the collaboration in procurement and installation of weather/ climate monitoring equipment in the country.

5.1.2 Identified needs and priorities for climate change research and systematic observation

Malawi has developed a National Framework for Water and Climate Services (NFWCS) to run from 2024 to 2029 with a total budget of USD 63,413,706.01 (GoM, 2024). The NFWCS will serve as a multi-stakeholder platform facilitating the development and delivery of hydro meteorological services at the country level including climate change research and systematic observation. This critical mechanism, aligned with the Global Framework for Climate Services (GFCS), focuses on enhancing the co-production, customization, delivery, and utilization of science-based climate predictions and services in key areas such as agriculture and food security, disaster risk reduction, energy, health, and water.

Establishing the NFWCS is crucial for enhancing climate risk management through the development and utilization of country-specific climate information and services. This framework informs coordinated and integrated action, decision-making, and policy formulation based on national contexts. Decision-makers at all levels and across sectors require hydro meteorological information and services for short-, medium-, and long-term planning. Effective development and delivery of hydro meteorological services at the national level necessitate close collaboration among service providers, researchers, and users, including governments, civil society, communities, the private sector, technical partners, and donors.

While it is expected that some elements of the NFWCS will be funded by Malawi Government through funding allocations to specific ministries, the NFWCS has also proposed additional support from international funding institutions such as Green Climate Fund (GCF) Readiness funds, Global Environment Facility (GEF), Adaptation Fund (AF), Special Climate Change Fund (SCCF) and Least Developed Countries Fund (LDCF), Bilateral Country Funds and other development cooperation missions such as NORAD and the Norwegian Embassy, FCDO, GIZ, Flanders, Qatar fund, Kuwait fund, EU, ECHO, REDD+, Indian government, Irish Aid, USAID, Bill Gates Foundation, AfDB, Arab, Development Bank, JICA, China Aid, Australian government, and other multilateral financial institutions such as the World Bank and United Nation (UN) agencies; UNDP, UNEP, FAO, WFP, UNICEF and WMO. Funds will also be mobilized through private sector through Public-Private-Partnerships with mobile telecommunications companies, construction companies, energy and water boards, aviation among others. The country will also continue participating in various initiatives of regional blocks such as SADC and the AU in support of the NFWCS.

5.2 Gender and climate action

5.2.1 Gender and climate context in Malawi

Malawi ranks towards the bottom of the UNDP's 2022 Gender Equality Index (148 out of 172 countries and territories) with an overall Human Development Index (HDI) value of 0.508 (172 out of 193 countries and territories) (UNDP, 2024). Related to climate change, Malawi's Planetary pressures-adjusted HDI dropped to 0.501 in 2022, a testament of the impact of climate change on human development.

The unequal status of women in relation to men in Malawi is shaped by of the intersection of poverty, discriminatory customary laws, and inequitable treatment in private and public spheres. Malawi has matrilineal and patrilineal systems that both perpetuate discrimination against women in terms of resource control. Women generally fare worse than men on most

social and economic indicators including wage equality, political participation, secondary and tertiary education enrolment, and literacy.

Despite making up 70% of the agricultural workforce, and producing as much as 80% of the agricultural produce for consumption and sale (Lodhi, 2018), women score poorly across all development indicators. They are less likely to be food secure, more likely to be classified as poor or ultra-poor than men (FAO, 2011), are less likely to own land or have control over household resources, have limited opportunities to access credit (Malindi & Kasambala, 2018), and are frequently excluded from participation in community (Molloy, 2016) or national level decision making. Women's limited economic empowerment also contributes to their vulnerability to climate change impacts. Inadequate access to land, labour, inputs and credit makes women more likely to engage in low-productivity subsistence agriculture and business activities that generate low returns.

As a result of climate change impacts, women may be forced to sell off assets such as small livestock or seek other means of generating income to support a family. Men's larger involvement in cash crop production and waged labor may mean they are susceptible to wage loss when crops fail, or they may temporarily migrate to other areas in search of other employment opportunities.

Climate-extreme events such as drought often lead to household food insecurity and malnutrition, with different impacts for men, women, and children. These impacts are linked to gendered vulnerabilities contextualized by social and cultural norms. Because women are the main providers of food for their families, they face greater constraints due to climate events. Resulting increasing vulnerability also expose women to other risks such as HIV as they resort to engaging in commercial sex work to fend off hunger.

5.2.2 Policies, Strategies and Frameworks for mainstreaming gender and other cross-cutting issues in climate action

Climate change and gender inequality are complex challenges that are interconnected. They require an integrated approach that builds resilience while also promoting human rights and justice, particularly for already marginalized people. Malawi's National Gender Policy (GoM, 2015) stipulates that Malawi is committed to gender parity, women's empowerment and upholding of women's rights as a prerequisite to poverty reduction and sustainable development. This commitment is premised on the provisions of the Republican Constitution of Malawi and also on the basis that gender equality is a basic human right as affirmed in a number of international and regional human rights instruments to which Malawi is a signatory, such as the Convention on Elimination of All Forms of Discrimination against Women.

Mainstreaming gender in Natural Resources, Environment and Climate Change Management is one of the prioritized actions through the gender policy. The policy has recognized that gender inequalities in natural resource and environmental management which include under representation of vulnerable groups in decision making forums on the utilization of forests, land and water has led to deterioration of natural resources and has displaced communities, especially those living in poverty. Other gender challenges include inadequate information and education on sustainable environment management, inadequate gender responsive environmental policies and programmes and inadequate mitigating measures of the impact of environmental degradation and climate change.

At international level, Malawi signed up to the Lima Work Programme on Gender at COP20[4]. This established a two-year work programme to promote gender balance and achieve gender-responsive climate policy by encouraging parties and relevant organizations to support training and awareness-raising for all delegates on issues related to gender and climate change, and building the skills and capacity of female delegates to enhance their participation in negotiations. Progress for Malawi on the implementation of the Lima work programme has been slow owing to a number of challenges as follows:

- Lack of relevant expertise and capacity within line ministries and institutions to conduct in-depth gender analysis, limited knowledge on the development of advocacy and gender mainstreaming approaches and inconsistent implementation of gender-responsive laws, policies, guidelines, plans and programs.
- Limited coordination among relevant stakeholders, coupled with insufficient domestic budget allocated for the implementation of gender-related plans and activities.
- Lack of financial and technical support from UNFCCC that target female negotiators from LDC group to participate actively in the climate change meetings
- Limited financial Support from UN agencies, NGOs, private sectors, other funding agencies and UNFCCC to the least developing countries including financing of capacity building activities in the field of gender and climate change.
- Limited support for Gender and Climate Change Focal Points to carry out the mandate as accorded in the Lima work Programme.
- Under-representation of women at the decision making and policy level in relation to climate change and disaster risk reduction. This includes limited representation at regional and global platform on climate change and disaster risk reduction.

5.3 Conclusion

Malawi through the Department of Climate Change and Meteorological Services participates in two Regional Climate Outlook Forums (RCOFs); Southern African Region COF (SARCOF) annually and South-west Indian Ocean COF (SWIOCOF) on invitation. At national level, observation stations are not adequate and well distributed limiting the functionality of climate observation. The country has developed a National Framework for Water and Climate Services (NFWCS) to run from 2024 to 2029 with a total budget of USD 63,413,706 and will require external support.

Regarding gender and climate action, climate change affects different gender categories differently. However, it has been observed that in Malawi, women tend to sell their assets in order to cope with climate impacts. Government has prioritized mmainstreaming gender in Natural Resources, Environment and Climate Change Management through the gender policy. In addition, at international level, Malawi signed up to the Lima Work Programme on Gender to promote gender balance and achieve gender-responsive climate policy.

[4] https://unfccc.int/topics/gender/workstreams/the-enhanced-lima-work-programme-on-gender

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Annex III: Common tabular formats (FTC)