



**MALAWI
GOVERNMENT**



Malawi 2015 Floods Post Disaster Needs Assessment Report



Malawi 2015 Floods

PDNA Report

A report prepared by the Government of Malawi

with Financial Support from

The European Union

And Technical Support from

The World Bank Global Facility for Disaster Reduction and Recovery,

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Foreword

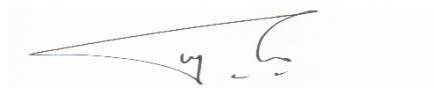
Disasters in Malawi are no longer unforeseen. The country is experiencing serious effects of climate change. There are floods or dry spell or both almost yearly. The 2015 floods were the most devastating in terms of geographical coverage, severity of damage and extent of loss. While 15 districts were directly affected, the whole country suffered from the effects. Water and electricity were interrupted. Damages on roads and bridges disrupted business.

An estimated 1,101,364 people were affected, 230,000 displaced, 106 killed and 172 reported missing. Economic losses were experienced at different levels: damage in infrastructure, crops and livestock; reduced production due to water and electricity shortage, disruption of economic system in communities where people were displaced; fiscal transfer to disaster response and crowding out of other functions as for weeks manpower concentrated more on disaster response than any other activities.

Government and development partners applied a three-pronged approach: rescue and evacuation; relief response; and recovery and reconstruction. Response was managed through 9 clusters that were activated and covered all areas of immediate human needs. I am grateful to development partners, government departments, private sector and individuals that provided support in various forms during the response phase.

The purpose for requesting a comprehensive Post Disaster Needs Assessment was two-fold; first to quantify the damage and loss and second to estimate cost of recovery and reconstruction. The assessment has shown that total damage and loss is US\$335 million while total cost of recovery and reconstruction is US\$494 million.

Government recognizes that although disasters cannot be avoided in the short to medium term, their effects can be minimized. For this reason, therefore, the reconstruction phase will focus more on building resilience. The World Bank has already provided US\$80 million to support recovery and reconstruction. We look forward to more support from development partners, corporate sector and individuals. I must stress that the recovery and reconstruction phase is very important for Malawi to minimize effects of disaster.



Saulos Klaus CHILIMA

Vice President of the Republic of Malawi and Minister of Disaster Management Affairs

Acknowledgements

This Post Disaster Needs Assessment (PDNA) of the recent flooding in Malawi would not have been possible without the dedication and technical and financial support of different partners and stakeholders at national as well as local levels, who contributed both time and expertise.

After the Government of Malawi (GoM) requested the World Bank to support conducting a comprehensive PDNA, the global partnership with the United Nations Development Programme (UNDP) and the European Union (EU) worked together to address the request. The World Bank and UNDP provided technical support. The assessment was prepared with financial support of the Africa Caribbean Pacific – European Union Natural Disaster Risk Reduction Program managed by the Global Facility for Disaster Reduction and Recovery (GFDRR).

This report reflects the relief and recovery efforts of the Government of Malawi to lift the nation out of the economic setbacks, infrastructure destruction and social impact caused by the floods. I would like to acknowledge the role played by members of District Civil Protection Committees (DCPC) and the District Commissioners (DC) in Nsanje, Chikwawa, Phalombe, Zomba, Blantyre, Chiradzulu, Thyolo, Mulanje, Balaka, Machinga, Mangochi, Ntcheu, Salima, Rumphi and Karonga districts.

I would also like to express my gratitude to the following organisations for the different roles played in the development of this PDNA report: Lilongwe University of Agriculture and Natural Resources (LUANAR) through Centre for Agricultural Research and Development, Chancellor College, the Polytechnic, UNDP, the UN Resident Coordinator's Office, FAO, WFP, UNFPA, UNICEF, WHO, UN-Habitat, ILO, IOM, UN Women, UN AIDS, Malawi Red Cross Society, World Vision Malawi, Goal Malawi and Christian Aid. The Office of the Vice President, Ministry of Agriculture, Irrigation and Water Development, Malawi Defence Force, Ministry of Finance, Planning and Economic Development, Ministry of Health, Ministry of Education, Science and Technology, Ministry of Transport and Public Works, Ministry of Industry & Trade , Ministry of Lands, Housing and Urban Development, Ministry of Labour and Manpower, Ministry of Local Government and Rural Development, Department of Irrigation, Department of Environmental Affairs, National Statistics Office, Department of Nutrition and HIV/Aids, Ministry of Gender, Children, Disability and Social Welfare, Department of Water Resources, ESCOM and all development partners at international level for their meaningful contributions.



ACP-EU Natural Disaster Risk Reduction Program

An initiative of the African, Caribbean and Pacific Group, funded by the European Union and managed by GFDRR

A handwritten signature in black ink, appearing to read "Paul CHIUNGUZENI", is written over a horizontal line.

Paul CHIUNGUZENI

**SECRETARY AND COMMISSIONER FOR DISASTER MANAGEMENT
AFFAIRS**

Abbreviations and Acronyms

AfDB	African Development Bank	DODMA	Department of Disaster Management Affairs
AIDS	Acquired Immuno-Deficiency Syndrome	DRM	Disaster Risk Management
APES	Agriculture Production Estimates Survey	DRR	Disaster Risk Reduction
BBB	Building Back Better	DSWO	District Social Welfare Office
BBS	Build Back Smarter	EAD	Environmental Affairs Department
BOP	Balance of Payments	ECD	Early Child Development
BRSP	Balochistan Rural Support Program	ECLAC	Economic Commission for Latin America and the Caribbean
BWB	Blantyre Water Board	EFSA	Emergency Food Security Assessment
CAADP	Comprehensive African Agricultural Development Programme	EIA	Environmental Impact Assessment
CBCCC	Community Based Child Care Centre	EIIP	Employment Intensive Investment Programmes
CBO	Community Based Organization	ENN	Emergency Nutrition Network
CCA	Climate Change Adaptation	EOC	Emergency Operations Centre
CCG	Community Care Group	EPA	Extension Planning Area
CDNA	Cyclone Damage and Needs Assessment	ESCOM	Electricity Supply Commission of Malawi
CEAR	Central East Africa Railways	EU	European Union
CFSVA	Comprehensive Food Security and Vulnerability Assessment	EWS	Early Warning System
CHAM	Christian Health Association of Malawi	FAO	Food and Agricultural Organization
CHD	Child Health Day	FBO	Faith Based Organisation
CMAM	Community Management of Acute Malnutrition	FEWS	Flood Early Warning System
COMESA	Common Market for Eastern and Southern Africa	FEWSNET	Famine Early Warning System Network
CPC	Civil Protection Committee	FISP	Farm Input Subsidy Programme
CRED	Centre for Research on Epidemiology of Disasters	GAM	Global Acute Malnutrition
CSO	Civil Society Organization	GBV	Gender Based Violence
DAHLD	Department of Animal Health and Livestock Development	GDP	Gross Domestic Product
DaLA	Damage and Loss Assessment	GFDRR	Global Facility for Disaster Reduction and Recovery
DCCMS	Department of Climate Change and Meteorological Services	GHI	Global Hunger Index
DCPC	District Civil Protection Committee	GIS	Geographical Information System
DDPs	District Development Plans	GoM	Government of Malawi
DEM	District Education Manager	GSD	Geological Survey Department
DFID	Department for International Development	GVH	Group Village Headmen
DHMT	District Health Management Team	HCT	Humanitarian Country Team
DHS	Demographic and Health Survey	HFA	Hyogo Framework for Action, 2005 2015
DIS	District Information Systems	HH	Household
DNA	Damage and Needs Assessment	HIV	Human Immuno-deficiency Virus
DNCC	District Nutrition Coordination Committee	HRNA	Human Recovery Needs Assessment
		HSSP	Health Sector Strategic Plan
		IDP	Internally Displaced Person
		IDSR	International Strategy for Disaster Reduction
		IEC	Information Education and Communication

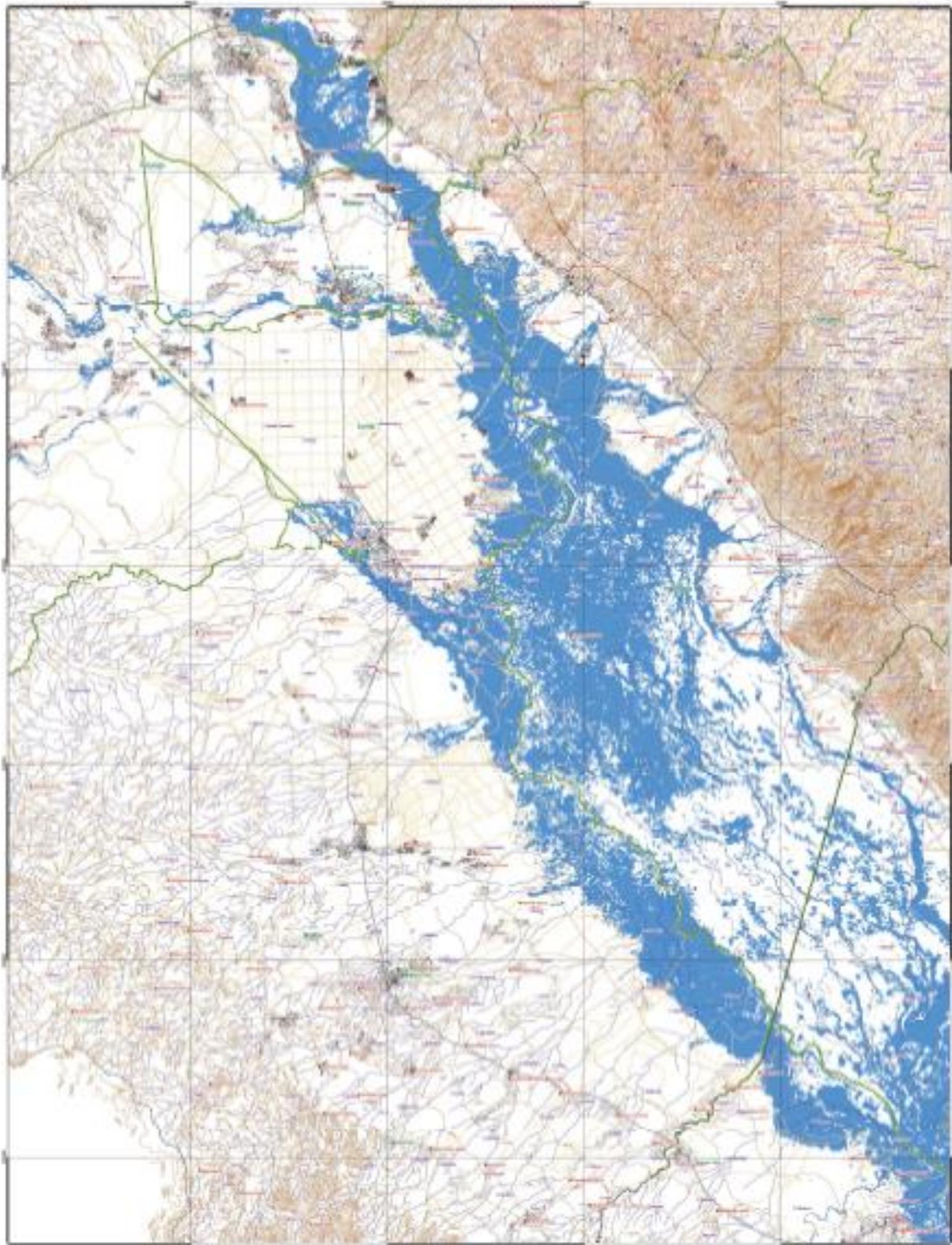
IFAD	International Fund for Agriculture	NEOC	National Emergency Operations
IFPRI	International Food Policy Research Institute	NEP	National Environment Policy
IHS3	Third Integrated Household Survey	NES	National Export Strategy
ILO	International Labour Organization	NFI	Non Food Items
INGO	International NGO	NGO	Non-Governmental Organization
IOM	International Organization for Migration	NHP	National Housing Policy
IPCC	Intergovernmental Panel on Climate Change	NNPSP	National Nutrition Policy and Strategic Plan
IRAP	Integrated Rural Access Planning	NRU	Nutrition Rehabilitation Unit
IRLADP	Irrigation Rural Livelihood Development Project	NSO	National Statistical Office
J4RL	Jobs for Resilient Livelihoods	OPC	Office of President and Cabinet
JEFAP	Joint Emergency Food Aid Programme	OTP	Outpatient Therapeutic Program
LDF	Local Development Fund	PASSA	Participatory Approach to Safe Shelter Awareness
LFS	Labour Force Survey	PDNA	Post Disaster Needs Assessment
MCH	Maternal and Child Health	PEP	Post Exposure Prophylaxis
MDF	Malawi Defence Force	PHED	Public Health Engineering
MDG	Millennium Development Goals	PLWA	People Living with Aids
MGDS	Malawi Growth and Development Strategy	PLWHIV	People Living with HIV
MHRC	Malawi Human Rights Commission	PVSU	Police Victim Support Unit
MNLUP	Malawi National Land Use Policy	PWP	Public Works Program
MoAIWD	Ministry of Agriculture, Irrigation and Water Development	REOC	Regional Emergency Operations
MOEST	Ministry of Education Science and Technology	RISDP	Centre
MOGCSW	Ministry of Gender, Children, Disability and Social Welfare	SADC	Regional Indicative Strategic Development Plan
MOH	Ministry of Health	SAM	Southern Africa Development Community
MOIT	Ministry of Information and Technology	SARCOF	Severe Acute Malnutrition
MoLGRD	Ministry of Local Government and Rural Development	SEP	Southern Africa Regional Climate Outlook Forum
MRCS	Malawi Red Cross Society	SGBV	Social Economic Profile
MSEOR	Malawi State of Environment and Outlook Report	SME	Sexual and Gender Based Violence
MVAC	Malawi Vulnerability Assessment Committee	SMS	Small and Medium Enterprise
MWK	Malawi Kwacha	SOP	Short Message Service
NCD	Non-Communicable Disease	SRH	Standard Operating Plan
NCIC	National Construction Industry Council	SRHR	Sexual Reproductive Health
NDPRC	National Disaster Preparedness and Relief Committee	SRWB	Sexual Reproductive Health and Rights
NECS	Nutrition Education and Communication Strategy	STI	Southern Region Water Board
		SWAp	Sexually Transmitted Infection
		SWG	Sector-Wide Approach
		TA or T/A	Sector Working Group
		TWG	Traditional Authority
		UN	Technical Working Group
		UNDAC	United Nations
			United Nations Disaster Assessment and Coordination

UNDP	United Nations Development Programme	UPE	Universal Primary Education
UNESCO	United Nations Educational, Scientific and Cultural Organization	USAID	United States Agency for International Development
UNFPA	United Nations Population Fund	VDC	Village Development Committee
UNICEF	United Nation Children's Fund	VSL	Village Savings and Loans
UNRC	United Nations Resident Coordinator	WASH	Water, Sanitation and Hygiene
UNRCO	United Nations Office of the Resident Coordinator	WATSAN	Water and Sanitation
UN Women	United Nations Women Entity for Gender Equality and Empowerment of Women	WB	World Bank
		WFP	World Food Programme
		WHO	World Health Organisation

SCALE 1:50 000

LOWER THRE FLOOR 200 2009

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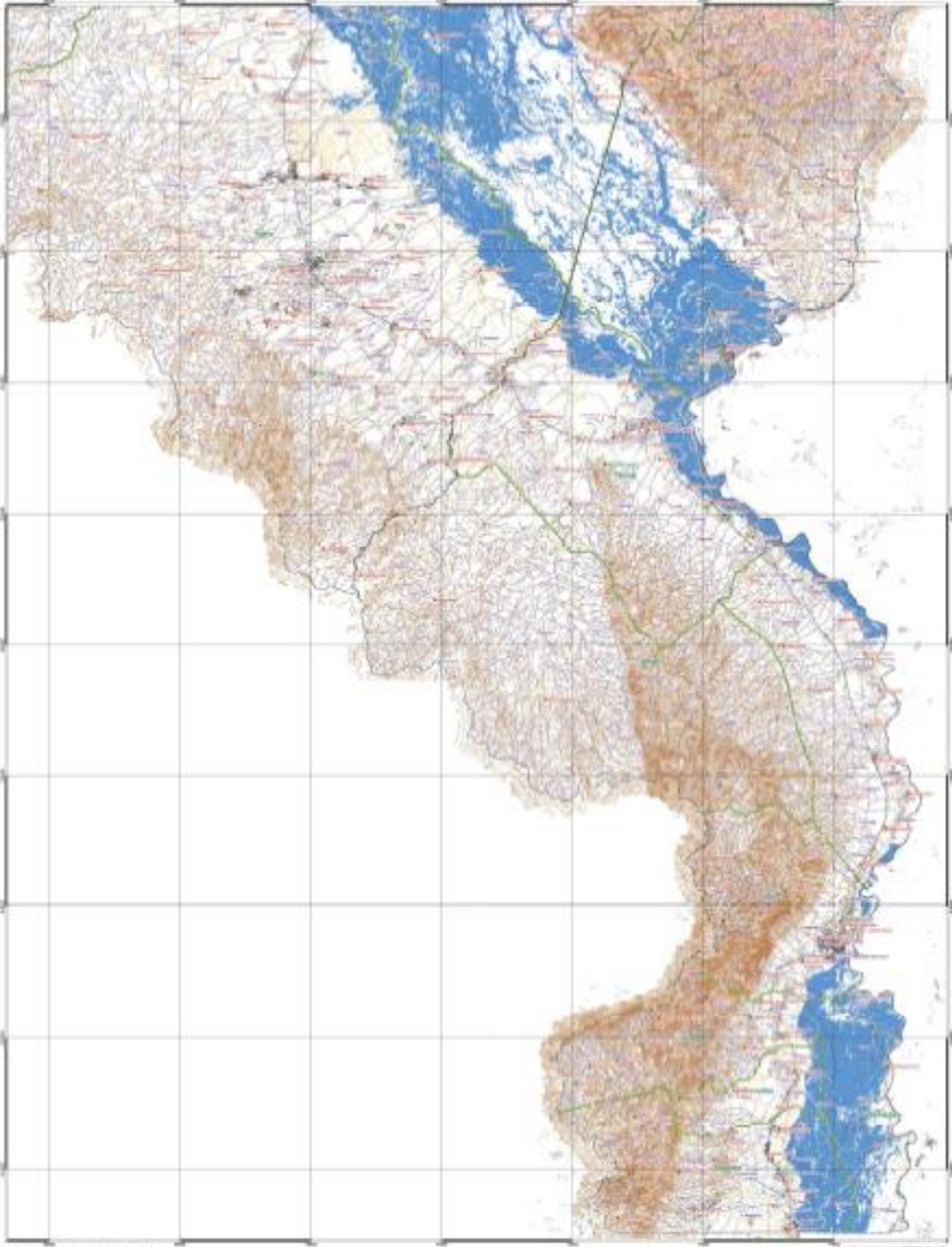
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Scale 1:50 000

LEGEND
Flooded Area
Non-Flooded Area
Roads
Buildings
Watercourse
Grid Lines

Scale 1:50 000
LEGEND
Flooded Area
Non-Flooded Area
Roads
Buildings
Watercourse
Grid Lines





Geological Map of Great Britain
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Executive Summary

Disaster Overview

1. Malawi faces a number of hazards, both natural and human-made, which include floods, drought, stormy rains, strong winds, hailstorms, landslides, earthquakes, pest infestations, diseases outbreaks, fire and accidents. The intensity and frequency of disasters have been increasing, in the face of climate change, population growth, urbanization and environmental degradation. Farmers in Malawi are directly affected by such disasters, as they are highly vulnerable to natural hazards. The Lower Shire, for instance, which constitutes a key agricultural region of the country, is prone to cycles of recurrent floods and droughts. Between 1967 and 2003, the country experienced six major droughts and 18 incidences of flooding,

which heavily impacted smallholder farmers. More recently, two major floods struck the country, including the district of Nsanje in January 2012, and the Mangochi District in January 2013, impacting many people and washing away large swathes of agricultural fields. These disaster events also resulted in the loss of life, infrastructure destruction (including roads, rail, bridges and homes), crop loss, perpetual food insecurity and health impacts (diarrhoea, cholera and malaria). In the



Photo 1: A flooded village in lower shire

case of Nsanje for instance, recovery and reconstruction needs were estimated at US\$7.3 million.

2. The January 2015 rainfall was the highest on record for Malawi and constitutes a 1 in 500 year event, and caused significant flooding – predominantly in the Southern Region, exacerbating an already precarious situation for rural households in this region. It is estimated that the floods affected 1,101,364 people, displaced 230,000 and killed 106 people. As a result, on January 13, 2015, the President declared a state of disaster for the following 15 districts: Nsanje, Chikwawa, Phalombe, Zomba, Blantyre, Chiradzulu, Thyolo, Mulanje, Balaka, Machinga, Mangochi, Ntcheu, Salima, Rumphi and Karonga. Several of these affected districts represent the poorest areas of the country. Based on the recent Integrated Malawi Household Survey, the most highly affected districts – Nsanje, Chikwawa, Phalombe and Zomba – have poverty incidences above the national average of 50.7 percent, ranging from 55 to 80 percent. The sheer lack of household data and information such as Sex and Age Disaggregated Data (SADD) of the people affected by floods limits the capability to undertake gender analysis to guide the emergency response and is yet another reminder of the urgent need of a national registration mechanism.

3. The 2015 floods have caused substantial damage and losses in the productive, public infrastructure and social service sectors, including private and community assets. The floods washed away livestock, destroyed thousands of buildings, houses and assets, and damaged roads, bridges, irrigation infrastructure and school and health facilities. To compound the disaster, the onset of the rains this year was delayed by more than 30 days in most parts of the

Southern Region. This late start of the rainy season and the shortened growing season that followed will likely further impede crop production and recovery in a country that heavily relies on agriculture for economic growth and subsistence.

Table 1: Summary of Key Physical Assets Damaged by the Floods

Sector	Physical Assets Damaged or Destroyed	Quantity
Items Description		
Agriculture	Crop Land Destroyed (Ha)	89,110
	Quantity of Fish Lost (No.)	38,223
	Irrigation Systems Head works (No.)	56
	Irrigation Canals (m)	46,776
	Irrigation Flood Embankment (m)	173
	Irrigation system pumping station (No.)	121
	Irrigation wells (No.)	2,707
	Irrigation drainage canals (m)	280
	Livestock (No.)	195,032
Education	Classrooms (No.)	508
	Teachers Houses (No.)	118
Health	Health Facilities (No.)	23
Housing	Houses (No.)	523,347
Social Protection	Number of Community-based Structures (No.)	1,233
Water and Sanitation	Boreholes (No.)	2,991
	Shallow Wells (No.)	493
	Water Intake Structures (No.)	36
	Water Treatment Plants (No.)	6
	Water Supply Conveyance pipeline (m)	9,363
	Water Supply Distribution pipeline (m)	8,152
	Hydrological Stations (No.)	15
	Dams (No.)	4
Transport	Roads (km)	1,220.53
	Bridges (No.)	185
	Culverts (No.)	465
	Drifts (No.)	1,340

4. The table below shows the total disaster effects and recovery and reconstruction needs for the 12 affected sectors, which come to around US\$335.0 million (equivalent to approximately 5.0 percent of GDP) and US\$494 million respectively. Excluding private housing, transport poses the single largest recovery needs (at 32 percent), followed by agriculture (including crops, irrigation, fisheries and livestock) (at 16 percent) and water and sanitation (at 13 percent).

Table 2: Estimate of Disaster Effects, Recovery and Reconstruction Needs

Sector	Subsector	Total Disaster Effects (Damage and Losses)		Recovery and Reconstruction Needs	
		MWK million	US\$ Million	MWK million	US\$ Million
Productive	Agriculture	29,563	68	33,965	78
	Industry & Trade	4,690	11	1,400	3
Social	Education	5,390	12	9,946	23
	Health	5,334	12	4,384	10
Infrastructure	Housing	60,414	139	76,230	175
	Energy	457	1	1,120	3
Cross cutting	Transportation	21,941	50	46,210	106
	Water and Sanitation	11,148	26	25,815	59
	DRM	750	2	1,554	4
	Environment	1,565	4	6,250	14
Cross cutting	Social Protection	1,706	4	3,196	7
	Nutrition	2,605	6	4,973	11
Total¹		145,563	335	215,043	494

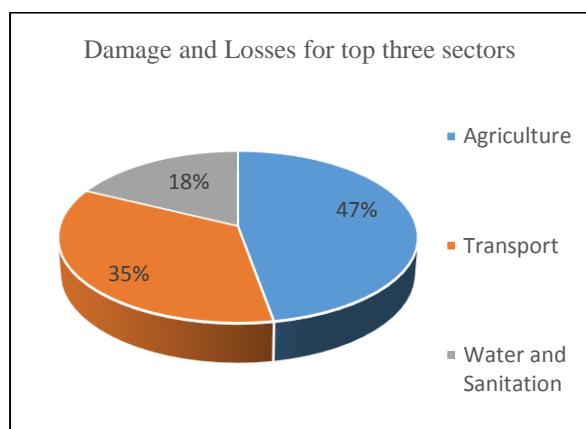


Figure 1: Ratios of Damage and Losses of Top Three Sectors

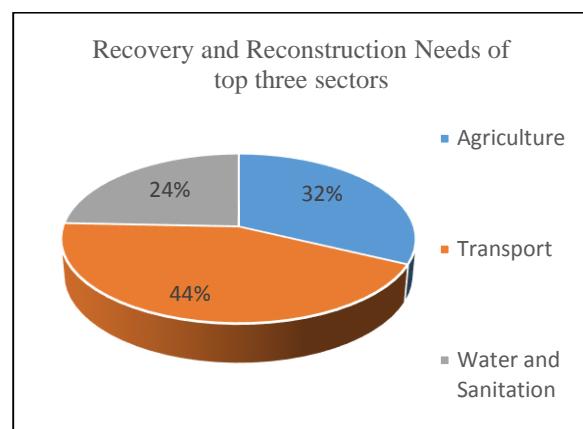


Figure 2: Ratio of Recovery and Reconstruction Needs of the Top Three Sectors

5. According to the findings of the PDNA, the effects of damage and losses are estimated to result in a projected negative impact on GDP growth in 2015, to the tune of 0.6 percent. The economic costs resulting from the negative impact of the floods, other things being equal, may thus lead to GDP growth falling short of the 5.8 percent projection set for 2015. Economic growth is largely premised on expansions in agriculture, manufacturing, wholesale and retail trade, utilities, and transport sectors, most of which have been directly or indirectly adversely affected by the floods. The Government's fiscal position may also deteriorate as the floods exert further pressure on the already limited fiscal space.

¹ The PDNA team is mindful of the possibility of double counting in some areas particularly with regard to the environment which was without a baseline data.

6. The PDNA shows that Blantyre, Nsanje, Chikwawa, Zomba and Mulanje are the worst affected districts. The total damage and losses calculated in this PDNA Blantyre and Nsanje each account for 16.4% followed by Chikwawa at 14.3% then Zomba and Mulanje at 12.6% each.

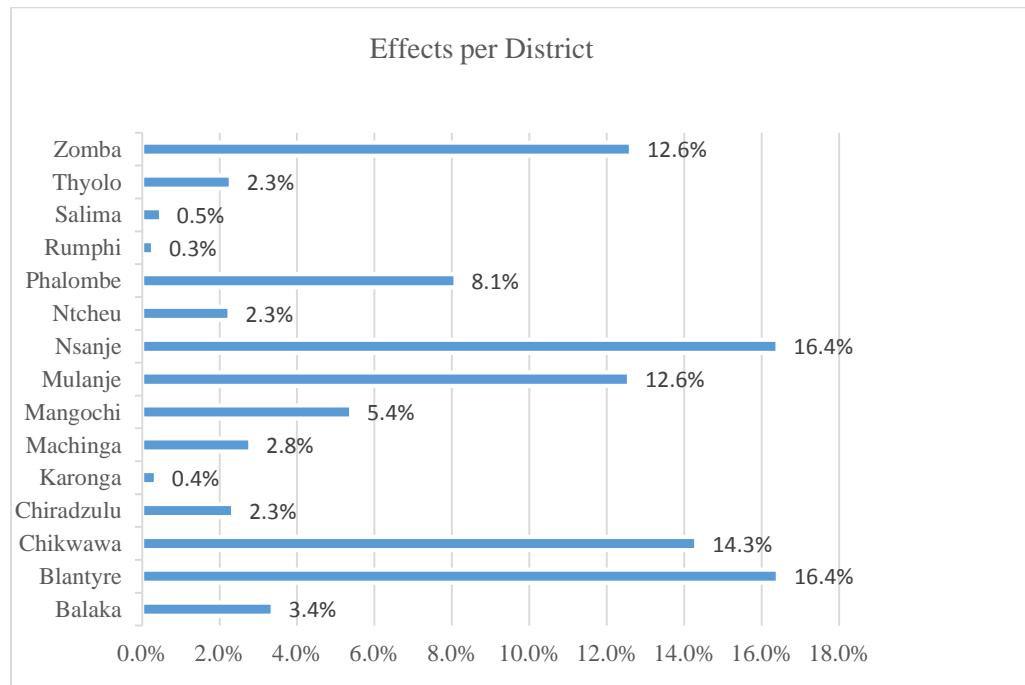


Figure 3: Total Disaster Effects per District

7. ²Moreover, according to the findings of the PDNA, the floods are expected to have pushed even more households in the affected districts further into poverty while there is a risk that non-poor households will move into poverty as a result of the loss of assets and livelihoods. Poverty simulations show that the floods hit the poorest district more thereby increasing the shock that could drive more individuals into poverty. Poor populations have little asset ownership so less coping capacity against external shocks. The floods have also resulted in loss of income of affected households rendering it difficult for them to meet their basic needs, thus deepening an already increasing income inequality across Malawi.

8. The cost estimates are based on the assumption that the relief phase would be completed in three months' time, early recovery and short term reconstruction would take up to twelve months, and medium to long term reconstruction would take up to three to five years respectively. If the different phases get delayed, the corresponding costs are expected to change/increase. Therefore, it is critical that

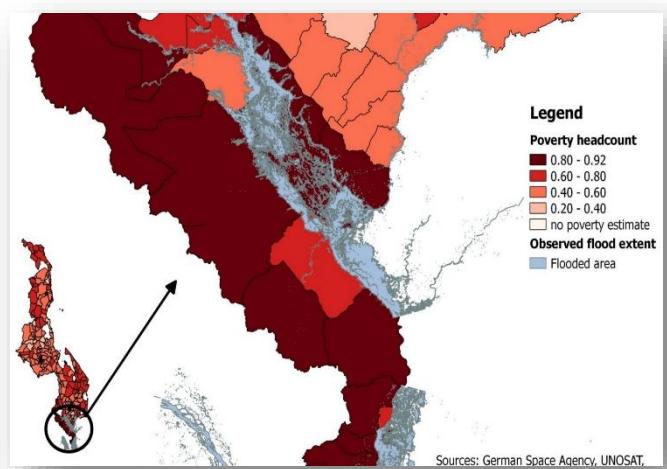


Figure 4: Poverty Distribution and Flooded Areas

² <http://blogs.worldbank.org/voices/recent-floods-malawi-hit-poorest-areas-what-implies>

the government starts planning the recovery and reconstruction as soon as possible so that immediate and short term phases can be implemented without delay.

About the Damage and Loss Assessment

9. *The Government of Malawi (GoM) requested the World Bank's support to conduct a comprehensive Post Disaster Needs Assessment (PDNA), in partnership with the United Nations Development Programme (UNDP) and the European Union.* The PDNA, led by the Department of Disaster Management Affairs (DoDMA) took place from February 18 to March 7, 2015. It has provided: (1) an impact and needs assessment across 12 selected sectors (2) cross-cutting guiding principles and a preliminary recovery strategy and (3) a roadmap that prioritizes early, medium and long-term needs for each sector. These elements are expected to be followed by the development of a *National Early Recovery Plan (ERP)* under the auspices of DoDMA that will provide a programmatic plan of action covering key institutional, policy, financing and implementation actions to ensure efficient, resilient and sustainable recovery.

10. *This report represents a quantification and validation of physical, social and economic damage, losses of productive processes and sector level recovery and reconstruction strategies.* The quantification of needs is then done with reference to damage, losses and sector level recovery and reconstruction strategies

11. *The PDNA focuses on medium to long-term reconstruction and provides the guiding principles for recovery.* An assessment of the damage, losses, and recovery and reconstruction strategies for each sector are provided in the detailed sector assessments.

8. *With respect to financial costs the PDNA has been generated against four assessment categories:*

- Damage refers to the monetary value of the completely or partially destroyed assets, such as social, physical and economic infrastructure immediately following a disaster. Wherever possible, the damage for assets is assessed in "as was" condition, i.e. at their book values;
- Losses are income losses, and comprise both the change of flow of goods and services and other economic flows such as increased expenses, curtailed production and diminished revenue, which arise from the damage to production capacity and social and economic infrastructure;
- Recovery costs measures includes two different sets of recovery activities that are carried out; first, the short term government interventions designed to kick start all affected economic functions, and second, those that will be required in the medium and long term to ensure that economic performance returns to normal or pre-disaster levels.
- Reconstruction Costs measure the cost of rebuilding lost assets and restoring lost services. It is generally assessed as the replacement cost with a premium added for building back smarter.

12. *The PDNA examined the three major Sectors of the economy as follows: The Productive Sector - Agriculture (including the issue of food security) and Industry and Trade; The Social Sector- Education, Health, Nutrition, and Housing; and Infrastructure - Transport, Energy and Water and Sanitation. The Cross cutting issues included: Disaster Risk Management, Employment and Livelihoods, Protection, Gender and the Environment.*

13. *The Department of Disaster Management Affairs led the assessment with all relevant government ministries and department represented at national and district level.* The assessment was technically supported by the WB, the UN and EU. The financial support was provided by the European Union through the ACP-EU Natural Disaster Risk Reduction program managed by the GFDRR. To meet the challenge of collecting data from the fifteen

districts, a multi-pronged approach towards damage determination, classification, collation, quantification and validation was developed and implemented. Customized and criteria-based sector templates for collection, collation and classification of secondary damage data were prepared that allowed simultaneous damage disaggregation at district level, thus allowing room for later data validation using various techniques. Extensive data training sessions were held for over seventy five (75) Government officials and over twenty (25) UN and WB staff and consultants. The PDNA team made use of the data which was collected by different clusters during the emergency response period. The teams then visited different districts for data validation and integration.

Summary of the Total Damage, Loss, Recovery and Reconstruction Needs

14. *This report presents estimates for:* (i) damage and losses, estimated at approximately MWK 145.6 billion (US\$335 million); and (ii) the cost of reconstruction needs ranging from MWK 215 billion (US\$494 million).

15. *The damage caused by the floods is estimated at MWK 124.5 billion (US\$ 286.3 million) while losses amount to MWK 21 billion (US\$48.4 million). The housing sector suffered the highest damage, calculated at MWK 59.3 billion (US\$ 136.4 million) followed by the Agriculture sector calculated at MWK 23.7 billion (US\$ 54.4 million), then transport sector at MWK 21.9 billion (US\$ 50.4 million) and water and sanitation sector calculated at MWK 8.2 billion (US\$18.9 million).*

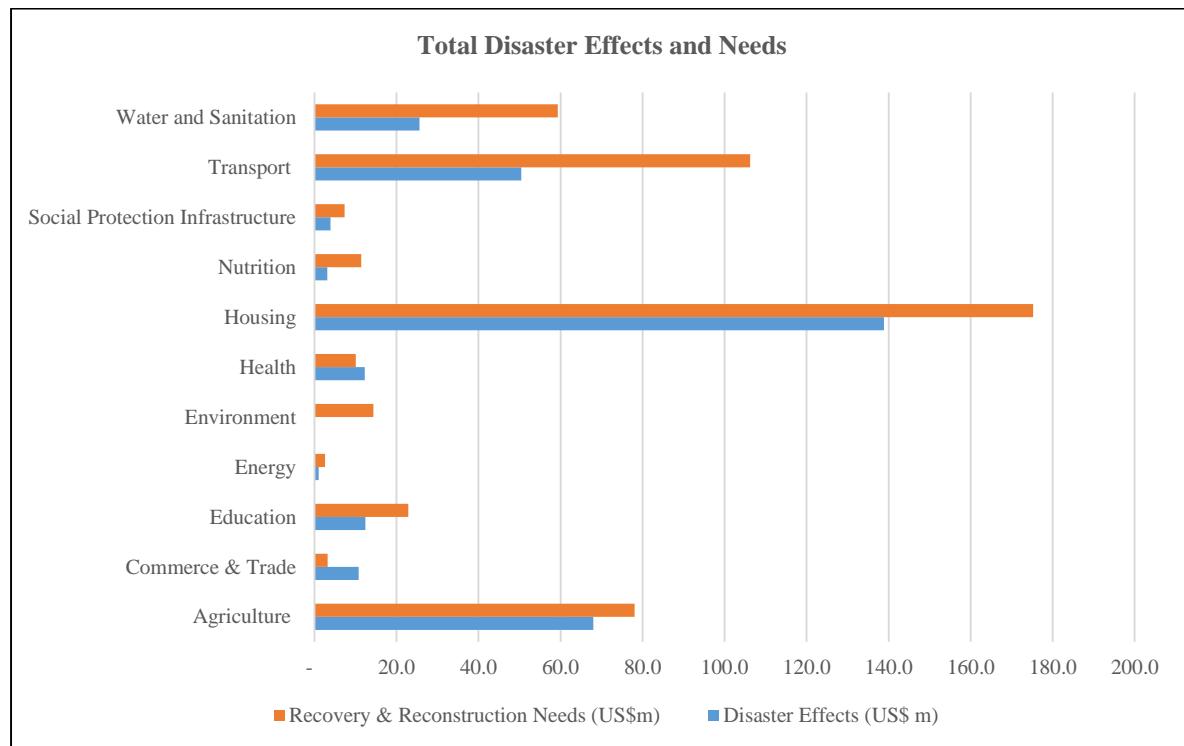


Figure 5: Total Damage, Loss, Recovery and Reconstruction Needs

16. *The recovery and reconstruction cost is estimated at MWK 215 billion (US\$ 494 million) of which recovery cost is estimated at MWK 38.4 billion (US\$ 88.2 million) and reconstruction estimated at MWK 176.7 billion (US\$ 406 million)*

Key Recommendations for Resilience Building

17. *Deducing from the findings and lessons from this floods the key recommendation for building resilience include the following:*

- Implement measures to address the expected increase in poverty as a result of the floods – such as safeguard food security (provide emergency food assistance and strengthen school feeding program)
- Address the expected decreased agricultural output by introducing cash for work program to provide incomes for affected households, strengthen irrigation intervention for increasing production until the next planting seasons
- Address the need for improved housing construction by implementing safer housing construction guidelines, updating the country building codes and improved land use planning for better allocation of buildings and infrastructure.
- Increase public understanding of disaster management and disaster risk reduction from national to community levels through comprehensive disaster risk management awareness and engagement program.
- Mainstream DRM in all sectors through facilitated disaster resilience designing of roads and infrastructures, introduction of disaster components in each program
- Strengthen disaster risk management financing which is properly connected to disaster preparedness and contingency planning to ensure quick and adequate financing when a disaster occurs.
- Strengthen institutional arrangements in management disaster in the country to ensure connectedness and success in the implementation of disaster risk management activities in the country.

Report Overview

18. *The report consists of preliminary sections that contextualize the disaster by describing the background of the 2015 floods as well as Malawi's social and economic context.* The report then introduces guiding principles for reconstruction and explains in greater detail the methodology used to conduct the assessment. Next, the macro-economic impact of the floods is presented followed by a summary of the effects and needs for each sector. The report also presents the social and environment effects of the disaster as well as the disaster risk management and climate change considerations. Then all detailed tables on damage, losses, recovery and reconstruction needs and prioritized recovery strategies for each sector are presented in the annex.



Background of the 2015 Floods



Background of the 2015 Floods

Overview of the 2014/2015 rainfall season in Malawi

19. *Malawi received extreme rainfall amounts early this year which have been associated with changes in climatic systems.* The seasonal rainfall forecast for 2014/2015 that was provided by the Department of Climate Change and Meteorological Services indicated that during October to December 2014, the Southern half of Malawi was expected to have normal to above normal rainfall amounts while the Northern half would have normal to below normal rainfall amounts. During the period January to March 2015, the Southern half of Malawi was expected to have normal to below normal rainfall amounts while the Northern half would have normal to above normal rainfall amounts. Overall, the country was going to experience normal rainfall amounts during October 2014 to March 2015. October marks the beginning of the rainfall season in Malawi which ends in March of the following year in some areas but extends to April in others.

20. *The floods affected 1,101,364 people, displaced 230,000 people and killed 106 people with another 172 people reported missing* as per UNDAC Assessment Report of 6 February 2015. The floods also damaged people's houses and household property. Standing and stored crops were also washed away and animals were lost. Parts of Early Warning Systems, including hydrological and meteorological stations were damaged. Flood mitigating structures such as dykes, as well as productive infrastructures such as irrigation, livestock disease control structures and fisheries infrastructure were affected. Other infrastructure, such as roads and bridges were also damaged

The 2014/2015 flood response

21. *The magnitude of the floods necessitated the State President, His Excellency Professor Arthur Peter Mutharika, to declare a state of disaster in the 15 affected districts and appealed for international assistance for the affected districts.* The affected districts were Nsanje, Chikwawa, Phalombe, Zomba, Mangochi, Blantyre, Chiradzulu, Thyolo, Mulanje, Balaka, Machinga, Ntcheu, Salima, Rumphi and Karonga. The worst affected districts were Nsanje, Chikwawa, Phalombe and Zomba. Following the declaration of a state of disaster by the State



Photo 2: Camp for Displaced People

President, the Government of Malawi, through the Department of Disaster Management Affairs (DoDMA), activated the cluster system in order to conduct assessments and coordinate the disaster responses. DODMA also requested the United Nations Resident Coordinator for a United Nations Disaster Assessment and Coordination (UNDAC) team to assist in the areas of: coordination, assessment, information management and shelter and camp management. UNDP provided support to the EOCs and the Malawi Inter-Agency Assessment Team, comprising Government ministries and departments, UN Agencies, and the Malawi Red Cross Society had conducted an initial assessment in Nsanje and Chikwawa and the District Civil Protection Committees had also conducted assessments in the other districts. Assessments and the response were hampered by the lack of a national registration system.

Institutional Coordination Arrangements:

22. The Government of Malawi has established institutional arrangements that implement the Disaster Preparedness and Relief Act (1991). The DRM policy 2015 has been endorsed during the response to the disaster. The Office of the President and Cabinet, through the National Disaster Preparedness and Relief Committee, directs the Department of Disaster Management Affairs and supporting technical committees to coordinate the implementation of disaster risk management at national level. In the districts, coordination is through the District Executive Committees and Civil Protection Committees at district, area and village levels.

National Disaster Preparedness and Relief Committee

23. The National Disaster Preparedness and Relief Committee (NDPRC) comprises of Principal Secretaries of all line ministries and departments, the Malawi Red Cross Society, four Non-Governmental Organizations (NGOs) and United Nations (UN) agencies which are co-opted when need arises. The committee provides policy directions in the implementation of disaster risk management programmes in the country and reports to cabinet. It is chaired by the Chief Secretary to the Government. After the declaration of a state of disaster, the NDPRC was upgraded in that, in addition to Principal Secretaries, Ministers, UN agencies and NGOs were attending meetings which were being held twice a week initially and later once a week to coordinate the flood response operations. The Vice President of the Republic of Malawi, who is Minister Responsible for Disaster Management Affairs, was chairing the meetings.

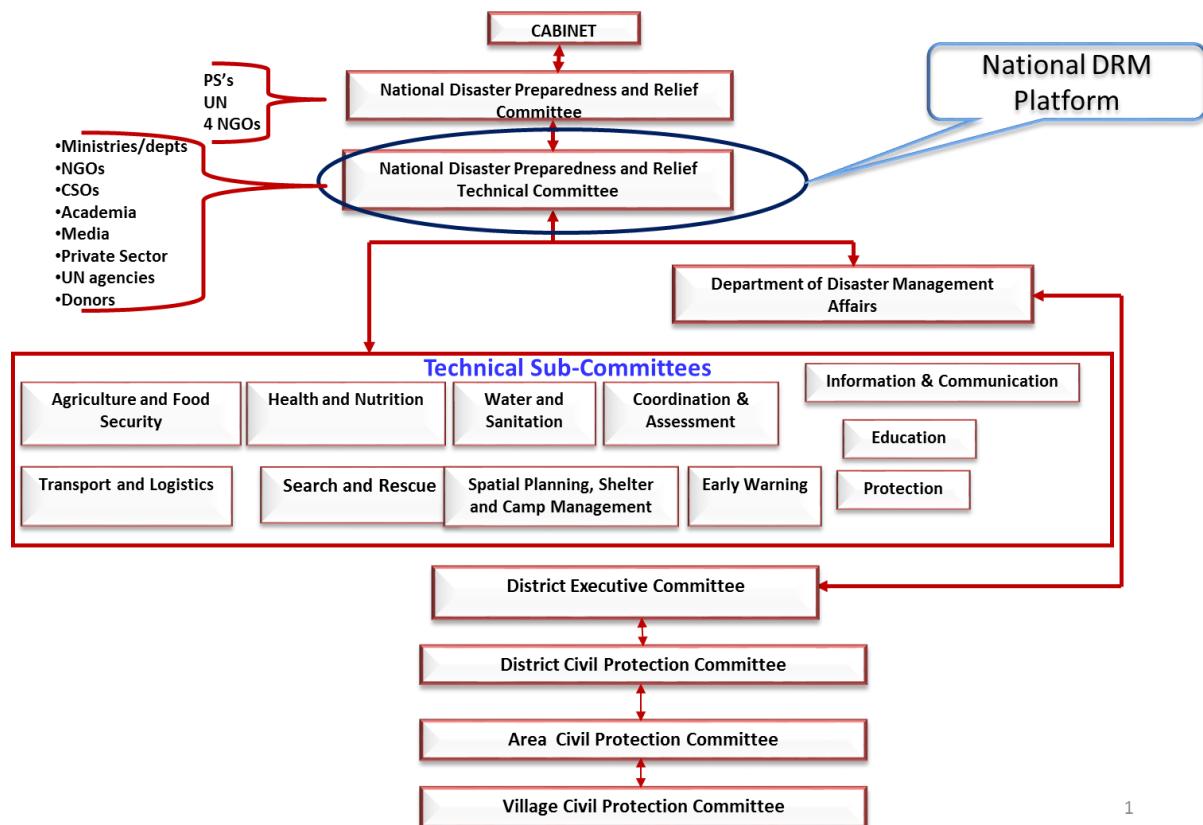


Figure 6: DRM Institutional Arrangement

Humanitarian Country Team

24. The Humanitarian Country Team comprises of Heads of UN Agencies, international and local NGOs, Government, and the Malawi Red Cross Society. This team is chaired by the United Nations Resident Coordinator (UNRC). For coordination of the current response,

donors and heads of Government Ministries and Departments have been co-opted into the HCT, the highest level coordination outside government coordination structures.

Coordination and assessments

25. *To ensure better coordination for the disaster assessment and emergency response, at operational level, ten clusters were activated.* These clusters are coordination, communication and assessment; Food Security; Agriculture; Water and Sanitation; Health; Nutrition; Education; Shelter and Camp Management; Protection; and Transport and Logistics. The clusters are led by government and co-led by UN agencies and the Malawi Red Cross Society and most have developed response plans to address the 2015 flood response.

26. A *National Emergency Operations Centre (NEOC) was established at DoDMA with support from UNDAC.* Clusters representatives were operating from the centre. UNDAC also facilitated the establishment of an Information Management Working Group (IMWG) at national level comprising of representatives from all clusters. The IMWG facilitated sharing of information on who was doing what, where and when (4Ws). A Regional Emergency Operations Centre (REOC) was established in the Government District Offices in Blantyre. The centre coordinated transport and logistics of relief commodities in the Southern Region but also organized cluster coordination meetings. The UNDAC team also facilitated establishment of District Emergency Operations Centre in the four most affected districts of Nsanje, Chikwawa, Phalombe and Zomba and deployed officers to the four districts during the duration of the mission to assist in coordination. DoDMA also deployed officers in the four districts to assist in coordination. The Malawi Defence Force deployed officers in three districts of Nsanje, Chikwawa and Phalombe to be in charge of operations and logistics in support of District Commissioners in the districts.

Legal and Policy Framework

27. *The Malawi Growth and Development Strategy (MGDS II) is the overarching development agenda for the country.* Disaster Risk Management is Sub-Theme 2 under Theme 3, Social Support and Disaster Risk Management in MGDS II. The long-term goal of the sub theme on DRM is to reduce the social, economic and environmental impact of disasters. Although disaster risk management is embedded as a sub theme in the MGDS II, the integration of disaster risk reduction into all sustainable development policies and planning processes at all levels cuts across all the themes of the MGDS II. Additionally, Malawi has a National Disaster Risk Management Policy (2015) with its implementation and monitoring and evaluation strategy; however, the Malawi National Disaster Risk Management strategy needs to have its gender policy and gender equality framework revised and some aspects strengthened. The National Disaster Risk Management Policy presents an opportunity for effective implementation and coordination of DRM programs and activities. Its successful implementation will require a comprehensive institutional and legal framework and political commitment. The policy has been developed to guide DRM mainstreaming in the country by providing policy strategies that would achieve the long term goal of reducing disaster losses in terms of life and the social, economic and environmental assets of communities and the nation as envisioned in theme 3 of the MGDS II.

28. *The DRM Policy is aligned to the Hyogo Framework for Action (HFA: 2005-2015) adopted by the United Nations World Conference on Disaster Reduction in 2005 of which Malawi is a signatory,* the Millennium Development Goals (MDGs), the United Nations Framework Convention on Climate Change, the Africa Regional Strategy for Disaster Risk Reduction and the SADC Disaster Risk Reduction Strategy. It highlights a set of key priority areas and strategies for making Malawi a nation resilient to disasters. It also provides a common direction

to all government, non-governmental organizations, private sector organizations, media and development partners at national and local levels on how to effectively implement disaster risk management programs and activities. Furthermore, Malawi has a progressive national gender policy and the legal environment including the Gender Equality Statutes and the National Gender Policy which provides the guidance to integrate gender into all development plans including Disaster Risk Management.

Lessons from the 2015 Floods

29. The following lessons were learnt from the 2015 floods and follow up activities:

- *Improve and adhere to contingency planning:* Seasonal rainfall forecasts are based on probabilities of weather and climate systems and actual weather does not always follow these predictions as was the case this year especially in the Southern Region. This clearly highlights the need for better contingency planning taking into account more hazards and risks to plan for and have clear triggers for when additional support is required at the village, T/A, district and national level as well as when national and international support is required. These triggers need to be based upon capacities available at these levels when compared with the magnitude of the disaster and should first and foremost be realistic.
- *Improve and strengthen flood forecasting and early warning system:* 2015 floods have exposed the weak forecasting and early warning systems. There is a need to strengthen these system countrywide so that relevant departments can coordinate and be prepared for the floods and communities are warned in advance.
- *Strengthen coordination:* DoDMA needs to strengthen coordination with other sectors and stakeholders not only those related to humanitarian response but also with those engaged in development planning, disaster risk management and climate change adaptation (CCA). It should build its capability to integrate gender analysis in its DRM planning and programming. The disaster showed that the coordination that exists is at most of patchy quality across districts and within clusters. Decentralization is key to enhanced preparedness and response and needs to be accompanied by adequate financial and human resources. Civil Protection Committees are the first responders, the ones that establish damage and loss as well the displaced and should be strengthened through DoDMA with the support of the Malawi Red Cross Society (MRCS) and Non-Governmental Organizations (NGOs). It should also be noted that the transfers of key personnel during disaster response is detrimental to coordination and should be avoided.
- *DoDMA to set up Emergency Response Operations Centers:* To better respond to disasters it is recommended that DoDMA sets up one National EOC and two regional EOC's (Lilongwe, Blantyre and Mzuzu respectively) together with 3 district EOCs in Nsanje, Chikhwawa and Karonga. The National EOC should be permanent while the others should be operationalized within 24hrs. There is also need to provide equipment and build capacity of existing and additional personnel in the management of EOCs both at national and district level. The districts EOC should coordinate and facilitate 'safe spaces for women and children' managed by UN, INGOs and local women's organizations.
- *Roll out the cluster system at district level:* The response to the floods was coordinated at national level through the cluster system. Ten clusters were activated and this provided a mechanism for sharing of information amongst organizations involved in the response either through cluster meetings or inter-cluster coordination meetings.

Coordination was a challenge at district level because the cluster system has not yet been rolled out. Sharing of information was a challenge. There is, therefore, need to roll out the cluster system to the district level to improve coordination of response. Gender programming and gender responsiveness should be mainstreamed into the cluster system.

- *Enhance (spatial) data and information management:* During the response to the flooding and the subsequent PDNA it was noted that the availability of data and information is of the utmost importance. The available data such as the sectorial baseline conducted over the last 3 years as well as open street map data and the standard government data at NSO did help tremendously during the response. However, it was noted that information management inefficiencies slowed down the response and may slow down recovery as well. One critical issue is the little use of the available tools like the 4W matrices and a lack of standards on how information like that for Sex and Age Disaggregated Data (SADD) should be collected, analyzed and reported. Guidance should also be provided to conduct gender-sensitive analysis and the inclusion of gender-sensitive indicators from the human development impact analysis. There is also a need to strengthen national and local capacity to collect SADD and mainstream gender in strategies, preparedness, plans and services. Poor data collection and data sharing on assistance provided by those not engaged with the clusters has contributed to the problem with much not being reported and that which has been reported staying within DCs and/or DoDMA at District and National level. ADDDRO/DC reports have been very narrative based, with little or no reference to the 4Ws. It is recommended to register all assistance available should be provided directly to the central or district (if present) level authority. It is also recommended that DoDMA should ensure that data collected during this PDNA will be preserved to be used for future analysis and as baseline data. It has also been noted within the current emergency response that sex disaggregated data is necessary to ensuring effective and relevant response and recovery. Gender Assessment Method should be applied in the information gathering to determine impact on women and men. It is recommended that data collection and information management is enhanced within the DoDMA, ministries and departments including at district level.
- *Strengthen decentralization/devolution of sector functions at district level:* Ministries have devolved to varying degrees. Least devolved sectors such as housing, trade and industry presented challenges in data availability/quality of the sector. There is need for all sectors to roll out devolution of their functions and support capacity building for the sector at the district level.
- *Strengthen the capacity of line ministries in district level in data management:* The capacity of these line ministries at the district level was reflected in the availability and quality of data and information for the sector at that level.
- *Strengthen early warning systems and preparedness:* While different stakeholders have developed/established and documented both indigenous and scientific early warning systems, there is need for political will to popularize and utilize the same. There is need for a coordination system among various stakeholders to achieve a unified incident command system for more effective early warning data and system as well as disaster management in future. In line with devolution there should be political will and finances for maintenance of dykes, river bank reinforcement and maintenance of drainage channels in preparation for rainy seasons. The early warning system should include social and protection approach mechanisms.

- *Strengthen disaster management and disaster risk reduction:* Disaster management plans and efforts are skewed towards emergency response and less on preparedness. It is recommended that more emphasis be given to improving DRM coordination, preparedness and longer-term mitigation efforts. In addition, emergency coordination should be improved through better communication and information sharing. Clear roles and responsibilities should also be widely stipulated and periodic simulation exercises should be conducted to ensure all stakeholders will do their parts as stipulated in the Operational Guidelines for DRM and Contingency Plans as and when required. Gender responsiveness should be integrated in the disaster management plans and preparedness in all aspects of the emergency management.
- *Enhance evacuation planning and community participation:* Evacuation is an integral part of any emergency response. When guidance on evacuation orders and plans are in place the needs of women and children should be adequately and decisively addressed. Challenges remain in people's compliance as was demonstrated again this year and government's role to ensure that property and belongings remain safe in situ. Better awareness in the districts is required possibly linked with new legislation. Evacuation planning structures should include women for information dissemination to be integral to response. Women's participation in the community structures should also be core in the planning and response processes.
- *Improve legislation, harmonization of resilience building policies which are enforced:* With the National DRM Policy in place, the government should facilitate the finalization of the review of the Disaster Preparedness and Relief Act (1991) and approval of the Climate Change Policy and facilitate the formulation of National Agriculture Policy. Their approval and implementation would greatly contribute to building a Malawi that is resilient to climatic and disaster related livelihood shocks. There is a need for improved legislation harmonization and enforcement of resilient building policies from a gender perspective. The government should enforce the DRM legislation.
- *Create a Separate Budget Vote for DRM:* Most of the DRM programs and activities rely heavily on external assistance mostly implemented by UN agencies, bilateral funding institutions and non-governmental organizations. Efficient and appropriate financial allocation to disaster risk management is a key factor in disaster mitigation, preparedness, response and recovery. There is, therefore, need to create a budget line for DRM in key ministries and departments and local authorities with a percentage for gender responsive activities.
- *Increase public understanding of disaster risk management:* The current flooding disaster is an opportunity for the government to let the public understand what disaster risk management entails and its linkage with climate change adaptation. The government needs to commit to making DRM a cross cutting issue in all ministries and departments and to make sure DRM activities and its gender equality components are adequately financed in each line ministry.
- *Integrate gender equality and the empowerment of women:* The DRM sector should ensure gender is a cross cutting issue in the emergency response and recovery interventions so that they are relevant, effective and sustainable for women and men of the affected population. Gender equality can increase and broaden ownership and sustainability of recovery initiatives by ensuring equal involvement of the population as a whole.

- *Formulate a National Early Recovery Plan (ERP):* Building on both this PDNA and the 2010 Flood Risk Management Strategy and Action Plan a detailed multi-sectorial ERP is required to ensure safe returns or relocations with adequate support.

Malawi's Macroeconomic Assessment



Macroeconomic Assessment

Economic and Social Context

30. Malawi's economy is largely agrarian, with the sector contributing about 30 percent to Gross Domestic Product (GDP) in 2014 (see Figure below). The economy has been experiencing spurts of growth in a pattern that has not been consistently positive for the past decade. From a boom between 2006 and 2010 where the country recorded an average growth of 8.7 percent, the economy slumped in 2011-12 before rebounding in 2013 (see Figure below). Growth has remained positive with a moderate rise in the pace from 6.1 percent in 2013 to 6.3 percent in 2014. Resilience in growth is premised on an expansion in agriculture, a good harvest arising from a generally favorable weather pattern in the 2013/14 growing season, as well as the availability of foreign exchange and fuel which bolstered growth in industry and service sectors.

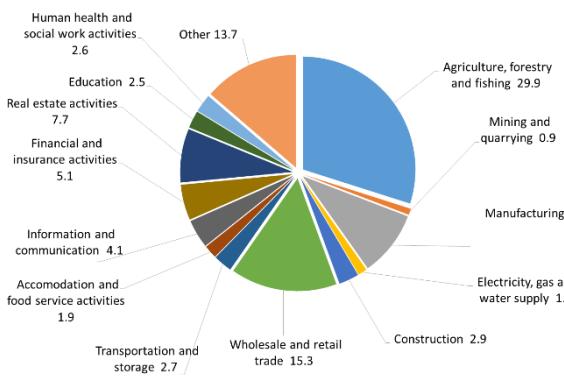


Figure 7: GDP Shares (percentage of total)

Source: Based on National Statistical Office and Ministry of Finance, Economic Planning and Development data

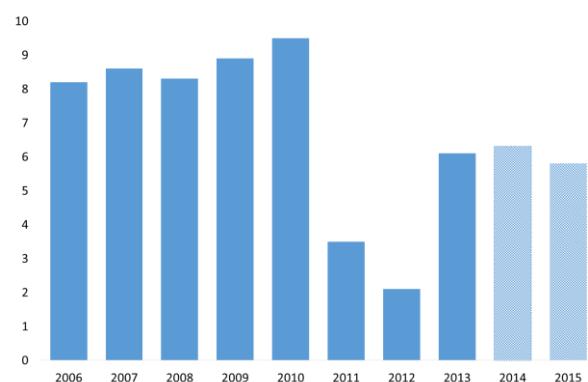


Figure 8: Malawi's GDP growth (%) 2006-2015

31. The country's fiscal position has been weakened by a sharp build-up of domestic payment arrears, a rise in the domestic debt stock, high interest rates and the fiscal deficit (including grants) estimated at 6.0 percent of GDP in 2013/14 up from 1.7 percent of GDP in 2012/13. A public funds mismanagement scandal and the associated loss of budget support placed Government's fiscal accounts under enormous pressure. This has resulted in a substantially enlarged budget deficit and a spike in domestic public sector borrowing. Despite lapses in expenditure, revenue performance continues to be strong offering some degree of respite to the fiscal position. Going forward, the fiscal gap is expected to narrow from 6.0 percent in 2013/14 to 4.1 percent in 2014/15 subject to risks emanating from shortfalls in external financing, accumulation of arrears, and high interest payments.

32. Malawi has run large current account balance deficits that have steadily widened over the years. This is attributed to the dominance of the merchandise trade balance that is perpetually in deficit as import growth continually outweighs the growth in exports. Over the period 2010 to 2014, the current account balance has remained in deficit with 12.1 percent of GDP recorded in 2011 and 22.6 percent of GDP in 2014. The worsening in the merchandise trade balance from 2011 is attributed to high oil prices on the international market and growth in the import bill as the exchange rate depreciated significantly in 2013 following its liberalization in 2012. On the other hand, the financial account has been in surplus (according to the BPM5 accounting method) mainly due to foreign direct investment inflows and foreign loans taken by the Government and the Reserve Bank of Malawi. Accordingly, the overall balance of the BoP has generally been positive and the country has been accumulating reserves.

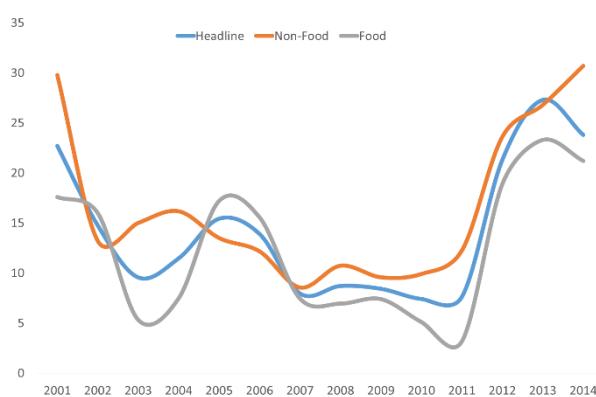


Figure 9: Trends in inflation – headline, food and non-food 2002 – 2014 (percent)

Source: Based on National Statistical Office data

which in turn led to a substantial rise in non-food inflation. In addition, high maize prices during lean periods exerted pressure on food inflation. The inflation rate began to decrease in the first half of 2014 following an abundant maize yield and the onset of the tobacco marketing season, and a mopping up of liquidity by the Reserve Bank of Malawi. In the second half of 2014, the weakening of the Kwacha resulted in further upward pressure on the inflation rate.

Table 3: Key macroeconomic indicators, 2010-2015

	2010	2011	2012	2013	2014e	2015f
GDP Growth (%)	9.5	3.5	2.1	6.1	6.3	5.8
Inflation (%) annual average	7.4	7.6	21.3	27.3	23.8	19.0
Exchange rate (average US/MWK)	150.5	156.5	249.1	369.2	424.4	--
Current account balance incl transfers (% of GDP)	(12.1)	(11.3)	(14.7)	(23.2)	(22.6)	--
Fiscal balance, including grants (% of GDP)/1	(0.7)	(1.5)	(8.3)	(1.7)	(6.0)	(4.1)
Fiscal balance, excluding grants (% of GDP)/1	(12.8)	(11.2)	(12.7)	(12.2)	(9.5)	(8.2)
External debt, public sector (% of GDP)	14.6	15.5	22.3	27.1	34.8	--
Domestic debt, Central Government (% of GDP)	15.0	17.7	14.4	21.9	20.0	--
Gross reserves in months of import cover	2.2	1.5	1.1	2.1	3.1	--
Average interest rate (91 days T-bill)	6.2	7.7	20.0	32.3	26.9	--

Source: Based on Ministry of Finance, Economic Planning and Development; National Statistical Office; Reserve Bank of Malawi data. Reported on a fiscal year basis

34. Half of the population lives below the poverty line with the country registered a slight decline in the poverty rate between 2005 (52.4 percent) and 2011 (50.7 percent)³. Most of the development efforts in Malawi are geared towards poverty alleviation with agriculture and trade being some of the sectors prioritized in the Malawi Growth and Development Strategy (MGDS II). About 85 percent of the population resides in rural areas whilst the urban area has a population of 15 percent. Around 47 percent of the poor population in the country lives in the rural areas of the Southern region. Thus, the Southern rural areas have a disproportionate share of the poor, reflecting the highest poverty rate in this region. Figure 10 below illustrates the poverty headcount in Malawi and the fifteen districts affected by the floods.

³ National Statistical Office, Third Integrated Household Survey (2010/2011).

35. With regard to distribution of income, statistics show that income disparities are deepening with an increasing Gini-coefficient from 0.39 in 2005 to 0.45 in 2011⁴. The extent of inequality does not differ across rural areas but the Southern region has the largest Gini coefficient which reflects income inequalities in the region. Figure 11 depicts income inequality in Malawi and in the fifteen affected districts. In terms of gender, female headed households (57 percent of the total households) are poorer than their male headed counterparts (49 percent).

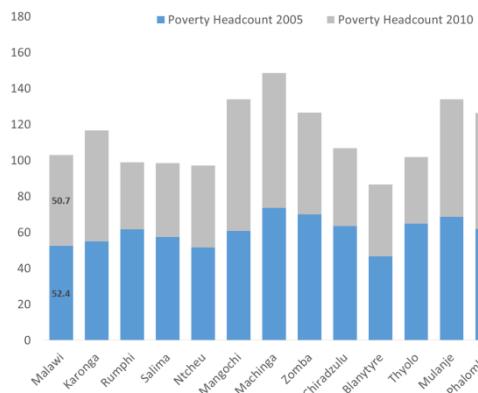


Figure 10: Poverty headcount (National and District)

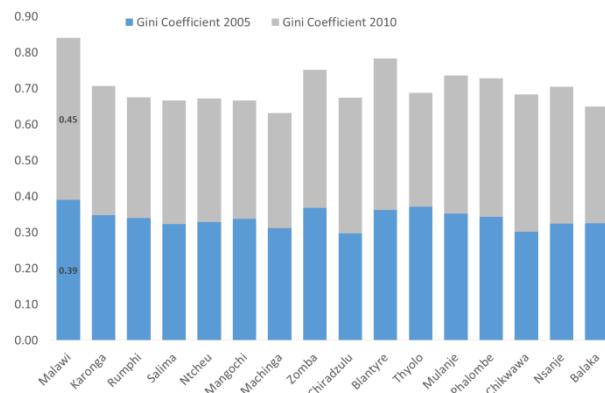


Figure 11: Income inequality (national and district)

Source: Based on National Statistical Office data

36. The employment rate for Malawi is reported at 79.6 percent, with the rate standing at 85.7 percent for men and 74.3 percent for women⁵. The country's population is projected at 16.3 million in 2015 with 8 million men and 8.3 million women⁶. About 64.1 percent of employed persons are in agriculture, forestry and fishing (see table 4). Of the country's total labour force, 20.4 percent is unemployed. Unemployment is more common among females than males. The percentage of unemployed women is 25.7 percent compared to 14.6 percent for men.

⁴ National Statistical Office, Third Integrated Household Survey (2010/2011).

⁵ National Statistical Office, 2013 Malawi Labor Force Survey.

⁶ National Statistical Office, Population Projections.

Table 4: Employment by sector

	Total	Sex		Residence	
		Male	Female	Urban n	Rural
Agriculture, forestry and fishing	64.1	58.5	69.9	16.4	70.4
Mining and quarrying	0.3	0.2	0.3	1.1	0.2
Manufacturing	4.1	4.5	3.6	7.6	3.6
Electricity, gas, steam and air conditioning supply	0.2	0.3	0	0.3	0.2
Water supply, sewerage, waste mgmt & remediation	0.2	0.4	0.1	0.6	0.2
Construction	2.6	4.2	1	7.2	2
Wholesale and retail trade and repair of motor vehicles	16.2	15.1	17.4	32.5	14.1
Transport, storage and communication	2	3.8	0.2	5.6	1.6
Accommodation and food services activities	0.7	0.7	0.8	2.4	0.5
Professional, scientific and technical	0.2	0.3	0.1	0.8	0.1
Administrative and support services	0.7	0.8	0.5	3	0.4
Public administration and defence	2	3.3	0.7	6.7	1.4
Education	2.2	2.8	1.6	4.4	1.9
Human health and social work	1.4	1.6	1.1	2	1.3

Source: National Statistical Office

37. The United Nations Human Development Index (HDI) for 2014 ranked Malawi at number 174 out of 187 countries⁷. Despite mixed results on key social development indicators, the 2014 Millennium Development Goals (MDGs) Report shows that the country is likely to meet four of the eight MDGs, namely, MDG 4: Reducing Child Mortality; MDG 6: Combating HIV and AIDS, Malaria and other diseases; MDG 7: Ensuring Environmental Sustainability; and MDG 8: Developing a Global Partnership for Development. The other four goals unlikely to be met are MDG 1: Eradication of Extreme Poverty and Hunger; MDG 2: Achievement of Universal Primary Education; MDG 3: Promotion of Gender Equality and Women Empowerment; and MDG 5: Improving Maternal Health; arguably this has have serious implications in the economic development of the country.

Economic Impact of the Floods

Effects on Gross Domestic Product

38. The economic costs resulting from the negative impact of the floods are likely to be limited but, other things being equal, may lead to GDP growth falling short of the 5.8 percent projection set for 2015⁸. Economic growth is largely premised on expansions in agriculture, manufacturing, wholesale and retail trade, utilities and transport sectors, most of which have been directly or indirectly adversely affected by the floods. The total losses associated with GDP are estimated at MWK 15.9 billion (US\$ 35.8 million), which is around 0.6 percent of GDP. This analysis adopts a GDP by production approach. Only losses related to output produced have thus been used to estimate the impact on GDP. In particular, losses related to housing, nutrition, water and sanitation and some components in health have not been directly factored in within the methodology used.

Table 5: Estimated losses per sector and in annual GDP in 2015

	Losses (MWK Million)	Percentage loss in growth
Agriculture	5,901.0	1.02
Crop and Animal Production	5,862.0	1.51
Fishing and Aquaculture	39.0	0.24

⁷ United Nations Development Programme, 2014 Human Development Report.

⁸ Ministry of Finance, Economic Planning and Development Projection.

Electricity and Water Supply	338.2	1.61
Commerce	3,603.7	1.48
Health	134.2	0.33
Total estimated loss in GDP in 2015	15,878.2	0.55

Source: PDNA Macro Team Calculations

39. While the human cost⁹ of the floods is relatively large, its net effect on national GDP is estimated to be small. In projected economic performance by sector for 2015, a reduction is felt in the agriculture, electricity and water supply, commerce and health sectors. The aggregate damage and losses¹⁰ as a result of the floods are US\$335 million (equivalent to approximately 5.2 percent of GDP). This includes damage to crops (mostly subsistence farming for own consumption) and loss of livestock, housing and livelihoods, as well as damage to public infrastructure such as roads, schools, health facilities, water and sanitation infrastructure. The impact of the floods on GDP growth estimated at 0.55 percent is muted due to the low levels of economic development in the affected areas, with the majority of the population engaged in subsistence agriculture. Poverty rates in the affected areas are among the very highest in Malawi, and as a result, while a significant share of Malawi's total population has been affected by the floods, the impact on purchasing power is estimated to be low.

40. Although the biggest economic loss experienced by a single sector was felt by the agricultural sector (due to losses in crop production), the overall effect on national agricultural output is small. Maize, cassava and rice were the worst affected crops attributing 63 percent, 18 percent and 9 percent of total crop production losses, respectively. In the absence of intervention, maize production which is the staple for the country is estimated to fall by 2.2 percent due to flooding having registered an estimated loss of 87,869 metric tons out of a national total production of 3,938,268 metric tons¹¹. Cash crops such as tobacco, sugar, tea and coffee were barely affected. For all the crops, the total land affected is 89,110 hectares out of the national total for affected crops of 3,727,576 hectares, representing a 2.4 percent fall. With regard to production, the total losses only represent 1.3 percent of national agricultural production. The overall effect on agricultural output is, therefore, limited. This is also reflected in the percentage loss in growth in the agricultural sector which is only 1.02 percent for 2015. It should be noted, however, that besides the floods disaster a further decrease in harvest is expected due to the combined adverse weather shocks of a late onset of rains and dry spells which have impacted a large part of the country.

41. Commerce was the second most affected sector, followed by the electricity and water supply and health sectors. Commerce experienced losses either directly as 33,800 household enterprises were destroyed, or indirectly through the loss of revenue due to loss of livelihoods and an unreliable electricity supply. The worst affected industries were wholesale and retail trade, manufacturing, and transportation and storage representing 65 percent, 25 percent and 7 percent of the losses respectively. With regards to the electricity and water supply sectors, losses resulting from loss of revenue were recorded. In particular, the electricity sector experienced damage from the disaster including a downtime of the whole power system during 14 days, on average. The losses in the water supply sector are a consequence of the increased

⁹ The floods have affected 1,101,364 people and displaced some 230,000 people

¹⁰ In defining disaster effects, the World Bank classifies damage as total or partial destruction of physical assets existing in the affected area whilst losses are changes in economic flows arising from the disaster. The value of damage is used as the basis for estimating reconstruction needs while the value and type of losses provides the means for estimating the overall socio-economic impact of the disaster and the needs for economic recovery.

¹¹ Agricultural Production Estimates Survey (APES) first round crop estimates 2014/15

power outages. Similarly, healthcare providers also experienced losses of revenue to the amount of MWK 134.2 million.

Effects on Government Fiscal Position

42. *The Government's fiscal position may deteriorate as the floods exert further pressure on the already limited fiscal space.* The current forecast on the impact of the floods on the fiscal balance takes into account potential losses in revenue due to decreased economic activity as well as an increase in expenditure allocated for disaster response and the relief process. With regards to individual and corporate tax revenue, the impact of the floods is likely to be small as the majority of households and enterprises affected were smallholder households which mainly produce for own consumption or are engaged in activity in the informal sector. Large-scale enterprises were not severely affected, though some indirect losses may be felt due to a decrease in consumer purchasing power and reduced output during the power outages. Government expenditure on disaster response in the revised 2014/15 budget has been earmarked at an estimated amount of MWK 2 billion (US\$ 4.6 million) within the Unforeseen Expenditures Vote. This represents a 100 percent increase from the previous amount of MWK 1 billion (US\$ 2.3 million). Expenditure overruns may be offset by increased external support which has been substantial as development partners continue mobilizing resources towards post-disaster needs.

Effects on Balance of Payments

43. *The effect on the Balance of Payments (BoP) may be positive provided that the current and financial accounts improve as a result of the disaster.* The overall effect on the current account is expected to be positive as unrequited transfers are likely to increase in order to finance relief and recovery items and impact on the merchandise trade balance is expected to be small. In particular, the merchandise trade balance may experience a small deterioration due to an increase in the import bill as reconstruction and rehabilitation may require importation of essential goods such as construction materials and pharmaceuticals. Nevertheless, the increase in the import bill is not expected to be significant as most construction materials can be locally sourced. In addition, exports are expected to remain unaffected as an examination of the country's top four export commodities, namely tobacco, sugar, tea and coffee, indicates a very limited negative impact resulting from the floods. The effect on the financial account is also expected to be positive due to an improvement in international reserves as development partners increase aid inflows in response to the disaster through the central banking system. If resources are being drawn from the current reserves, however, it is expected that international reserves will decline.

Effects on Inflation

44. *The pace of disinflation may be slower than anticipated particularly if the impact of food shortages becomes critical.* Assessment on price changes can best be measured through three main components of the Consumer Price Index (CPI) namely food and non-alcoholic beverages; housing and electricity; and transportation. These components have respective weights of 50.2 percent, 14.7 percent and 6.6 percent in the CPI basket. Hence, inflation is likely to be more influenced by changes in food prices that account for around half of the weighted CPI. Any impact resulting from food shortages could push maize prices upwards, though this could be mitigated if there is an adequate response to food supply. With regards to the housing and electricity component this will probably not be significantly affected by the disaster. In particular, less than 1 percent of the houses destroyed by the floods were constructed using permanent materials thereby not affecting the demand for such materials. With regard to the transport component, it is also unlikely that there will be any significant

impact mainly because of an offsetting effect of the recent oil price decline and the relatively small weight it has in the CPI basket. Thus the overall effect of the floods on inflation will primarily depend on the response to food shortages and the impact on food prices. It is also recognized that inflation could also be pushed up by an injection of extra liquidity into the economy as recovery and reconstruction efforts commence.

Effects on Employment

45. *The natural disaster has affected approximately 1,101,364 people, including some 336,000 people who would have been displaced, which may in turn have an impact on employment.* The assessment on employment mainly focuses on income losses from the agriculture sector which accounts for a large part of the informal sector¹² as well as non-farm household enterprise engaged in trade, commerce and industry as the main sources of rural livelihood.

46. *In the absence of appropriate interventions, the affected smallholder households will remain vulnerable until the next planting season.* The majority of smallholder households rely on an annual rain-fed agriculture to generate their income. The average income loss per affected smallholder household is estimated at MWK 208, 846 (US\$ 469)¹³.

47. *It is estimated that the destruction and damage suffered by non-farm Household Enterprises (HHEs) across the 15 flood affected districts has caused prolonged stoppages and disruption of business activities amounting to more than 4 million work days lost¹⁴.* It is important to note that the actual number of work days lost is likely to be higher as the losses of HHEs that were affected by the disaster through interruptions in the supply chain and reduced electricity supply, among other factors, were not taken into consideration.

48. *The overall income loss suffered by HHEs across the 15 flood affected districts amounts to approximately MWK 3.6 billion (US\$ 8.1 million)¹⁵.* The highest income loss was recorded in rural Blantyre with MWK 860 million (US\$ 1.9 million) lost followed by Nsanje and rural Zomba with MWK 423 million (US\$ 950,000) and MWK 370 million (US\$ 840,000) respectively. As the Livelihood Assessment focuses exclusively on income loss experienced by HHEs the total impact to the HHEs would be exacerbated by destroyed and/or damaged infrastructure, equipment and tools among others.

Effects on Poverty

49. *The floods are expected to have pushed most households in the districts affected further into poverty while there is a risk that non-poor households will move into poverty as a result of loss of assets and livelihoods.* According to the third Integrated Household Survey, about 80 percent of households in Malawi are engaged in agricultural activities and are prone to natural disasters. Districts currently affected by the disaster have had increasing poverty rates with those in the Southern region being the worst affected. Poverty data¹⁶ shows that Nsanje, Chikhwawa, Phalombe and Zomba – the worst hit districts - have a poverty incidence of 81.2 percent, 81.6 percent, 64.5 percent and 56.6 percent, respectively. This is above the national poverty rate of 50.7 percent. Furthermore, and as earlier alluded to, the floods have resulted in loss of income of affected households rendering it difficult for them to meet their basic needs thus deepening an already increasing income inequality across Malawi.

50. *With regard to gender disparities and vulnerability, 70 percent of houses owned by poor and female headed households are constructed using materials and techniques that rendered*

¹² 89 percent of working persons are in informal employment (Malawi Labor Force Survey, 2013).

¹³ See Annex 12, Table 44: Employment and Livelihoods Sector Assessment – income loss in agriculture

¹⁴ See Annex 12, Table 44: Employment and Livelihoods Sector Assessment – income loss in agriculture

¹⁵ See Annex 12, Table 44: Employment and Livelihoods Sector Assessment – income loss in agriculture

¹⁶ National Statistical Office, Third Integrated Household Survey (2010/2011).

houses more vulnerable to natural disasters. The assessment reveals that out of 77,123 houses affected by the floods, 83 percent fall into the semi-permanent and traditional/temporary classifications/temporary structures. The vast majority of damage could have been prevented through the use of raised foundations, damp-proof courses to the base of walls, waterproof and sacrificial coatings to walls and also by incorporating large roof overhangs or verandahs to keep the rain off walls and effective local drainage networks.

Effects on Social Development

51. *The natural disaster has affected communities' social welfare in education, health, sanitation, and housing, among others.* In terms of education, it is likely that affected schools will experience high drop-out rates due to prolonged absenteeism and consequently low literacy rates. For displaced people living in camps, health concerns emerged in the areas of access to safe drinking water and increased risk of HIV infections and malaria.

52. *The floods are, therefore, expected to negatively affect some of the MDG indicators. For example, the percentage of households using improved sources of drinking water and improved sanitation facilities is likely to decline in the health sector.* In particular, the time and distance travelled to collect potable water has increased. The percentage of children of school going age currently attending primary and secondary school is also likely to decline in the education sector. In terms of gender, after displacement, girls and women in the affected districts have become more vulnerable to sexual abuse and harassment. This calls for immediate response if the country is to remain on course in attaining MDG 3.

53. *Meaningful and active participation by women in planning must be promoted actively in service delivery and institutional arrangements and procedures included in the recovery framework.* Disasters also provide an opportunity to build back better. It can help identify how government functions and services can be improved so as to respond to inequalities, address imbalances in programming and investment and eliminate biases in public policy and processes that deepen the exclusion of women.

PDNA Approach and Methodology

Approach and Methodology

54. *The PDNA was a Government-led overarching and consultative assessment with the Department of Disaster Management Affairs (DoDMA) in the lead in collaboration with all relevant government line ministries.* The vast scale of damage that encompassed almost all regions of the country demanded an unparalleled level of baseline data collection spread over fifteen districts covering eleven sectors of the economy.

55. *The assessment flexibly applied the United Nations Economic Commission for Latin America and the Caribbean (UN ECLAC) methodology to suit the unique country situation and the scale of the disaster.* The impact of the floods on each sector of the economy includes the following four costs: (i) Damage; (ii) Losses; (iii) Recovery Cost and (iv) Reconstruction Cost.

56. *Damage refers to the monetary value of completely or partially destroyed assets such as social, physical and economic infrastructure calculated at the book value or the depreciated value of lost immovable assets.* Movable assets like goods, furniture, machineries and inventories lost during the floods are valued at the replacement cost.

57. *Losses are income losses and comprise both the change of flow of goods and services and other economic flows such as increased expenses, curtailed production and diminished revenue, which arise from the damage to production capacity and social and economic infrastructure.* Losses occur from the time of the disaster until full economic recovery and reconstruction have been achieved in some cases lasting over several years. Wherever possible damage and losses have been further split across public and private sectors to assist in macroeconomic analysis and to guide the development of public sector recovery strategies that optimally also take into account the recovery of private sector assets and services. Losses are expressed in current values.

58. *Recovery cost includes two different sets of recovery activities that are carried out;* first, the short term government interventions designed to kick start all affected economic functions, and second, those that will be required in the medium and long term to ensure that economic performance returns to normal or pre-disaster levels.

59. *Reconstruction costs are calculated using the replacement value (and not the book value) of assets and infrastructure.* Extensive efforts were made to maintain close coordination with the UN early recovery needs assessments in order to avoid overlaps or duplication.

Build Back Better and Smarter

60. *While calculating the reconstruction cost the principle of Building-Back-Smarter (BBS) has been applied.* Under the BBS principle Building-Back-Better (BBB) has been selectively applied across sectors and within sectors to ensure a cost-optimized multi-hazard reconstruction. Under this approach, 2 factors for right siting and right sizing have been introduced along with flood protection infrastructure improvements.

Data Collection

61. *To meet the challenge of collecting data from the fifteen districts of different sectors a multi-pronged approach towards damage determination, classification, collation, quantification and validation was developed and implemented.* Customized and criteria-based sector templates for collection, collation and classification of secondary damage data were prepared that allowed simultaneous damage disaggregation at district level thus allowing room for later data validation using various techniques. Extensive data training sessions were held for over seventy five (75) Government officials, about five (5) NGO staff and over twenty five (25) UN and

WB staff and consultants. The PDNA team made use of the data which was collected by different clusters during the emergency response period. The teams then visited different districts for data validation and integration.

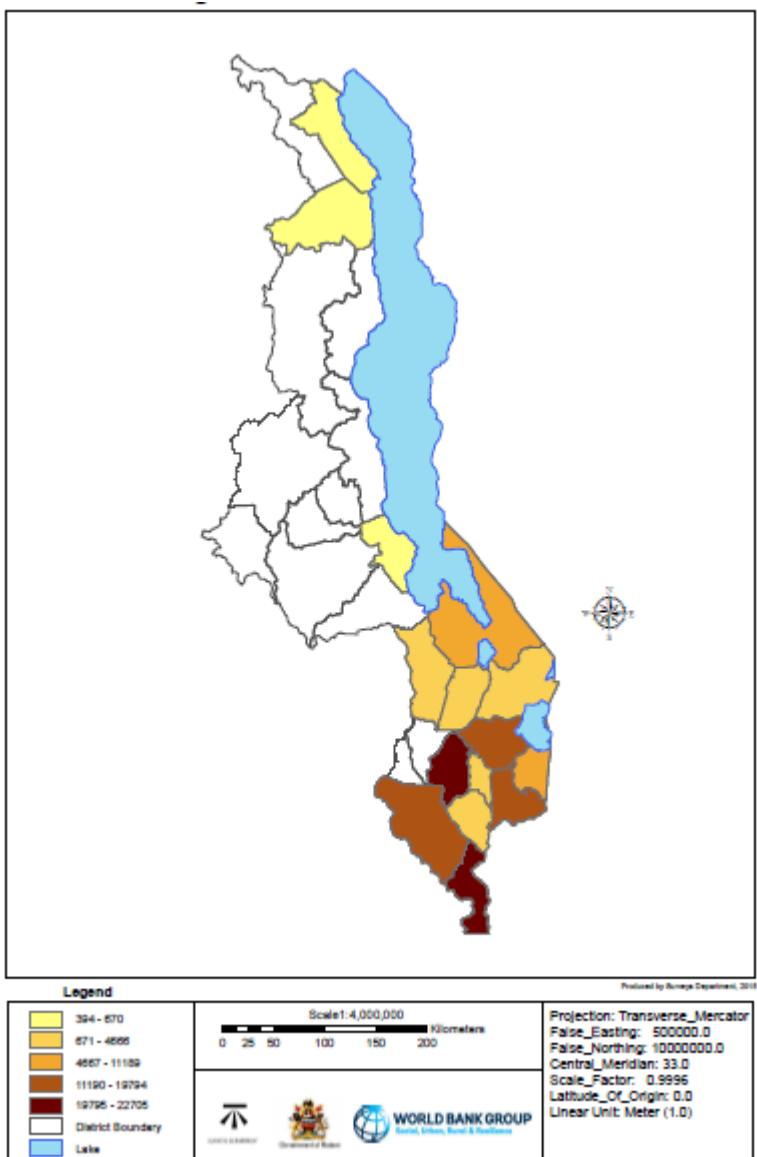


Figure 12: Disaster Effects per District in MKW millions

teams; (b) collective determination of percentage-based damage in sectors such as housing and the private sector for certain districts; (c) analytical validation of damage data by sector teams, employing techniques and plausibility checks such as relative-to-baseline analyses, disaggregated analysis, comparisons across vertical and horizontal streams of district; (d) limited, sample-based physical validation by the sector teams.

64. Furthermore, the PDNA team utilized reports produced by the UNDAC team, Inter-Agency Assessment team (IAAT) districts team, and the cluster teams and sector teams, e.g. Displaced Tracking Matrix Data (DTM), Joint Wash, Agriculture and Shelter Damage Assessment and the Malawi Vulnerability Assessment Committee (MVAC) Update. These reports were analyzed as part of the desk review and then the team visited different sites to validate the information gathered from the reports.

Damage Quantification

62. *The process of damage and loss quantification broadly entailed the engagement and mobilization of over one hundred (100) national and international sector specialists for sector damage assessments and subsequent needs strategizing and quantification; and the use of global expertise through the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR) and United Nations Agencies for the dissemination of good practice, sector assessment notes, and provision of elaborate training in the Post Disaster Needs Assessment (PDNA) methodology to the sector teams and specialists.*

Validation

63. *Damage validation for the data provided by the government utilized multi-pronged approach including: (a) upfront data validation through desk review and detailed analysis of pre-disaster asset and infrastructure baseline data by the sector*

Summary of Damage and Loss by Sector

Productive Sectors



Summary of Damage and Loss by Sector

65. This section gives an overview of the damage and recovery needs by sector. Detailed description of each sector are provided in the volume two of this report.

Productive Sectors

Agriculture, Livestock, Fisheries and Irrigation

66. *Damage – MWK 23.7 billion (US\$ 54.4 million)*. The damage to the agriculture sector includes losses in production to crops planted; washed away animals; partially or fully destroyed irrigation infrastructure, livestock and fisheries infrastructure and other assets. The irrigation infrastructure damage alone counts for MWK 2.4 billion (US\$ 5.6 million) where intake, conveyance and infield infrastructure were damaged by the floods. Most damage was encountered in Mulanje, Nsanje, Mangochi and Chikwawa.



Photo 3: A tobacco crop in the aftermath of the flood

67. *Losses – MWK 5.9 billion (US\$ 13.6 million)*: The loss in the agriculture sector includes production by the sub sectors of crops, livestock and fisheries due to the impact of the disaster. It also include higher production cost due to medication requirements in livestock production and higher inputs requirement in crop production.

68. *Recovery Needs – MWK 11.8 billion (US\$ 27.2 million)*: The immediate and short-term requirements would be selective restoration of high priority irrigation schemes, watercourses, storage tanks and wells, and distribution of seeds, tools and fertilizer. The protection of the remaining livestock through vaccination and prophylactic treatment to minimize further livestock losses should also be considered. While irrigation infrastructure damage was relatively minor compared to other sub-sectors, their urgent repair is critical so as to safeguard the next cropping season for production and avert further economic loss. This will facilitate second crop production and limit post flood livestock losses and begin restoration of basic livelihoods of vulnerable groups. Also, there is an immediate need to salvage existing livestock through prevention of potential disease outbreaks with prophylactic vaccination and medication. A total of MWK 10,421 million (US\$ 24 million) would be required to meet the immediate and short-term requirements.

69. *Reconstruction MWK 22.1 billion (US\$ 50.9 million)*: Medium to long term support would be needed for repair of irrigation and flood protection structures, provision of seeds, tools and fertilizers for rain-fed crop production; livestock distribution targeting cattle, goats, sheep and pigs; rehabilitation of livestock and fisheries infrastructure and rehabilitation of offices and extension services. In the long-term, there is a need to address the community preparedness and early warning for flooding and environmental challenges in the highlands through re-forestation including sustainable management of watersheds in the highlands of Malawi. A total of MWK 22.1 billion (US\$ 50.8 million) will be needed to meet the medium to long-term needs. Many farmers are highly dependent upon their own produce and, therefore, need safe storage areas on the homestead. Aside from grain stores, homes are the most common places

where food and tools are stored for security. As such, housing reconstruction is also a priority for food security.

Food Security

70. Damage – MWK 64 billion (US\$147.18 million) – combination of other sector damages, not food security sector specific: As food security is a cross cutting sector, the damage total for this sector is a combination of damage data from other sectors, including agriculture, transportation, protection, employment & livelihoods, nutrition and WASH. The combination of lost crops, lost income, disruptions in transportation and damaged WASH infrastructure can result in significant increases in food security and spikes in acute malnutrition rates. The direct damages include loss of standing crops; damaged lands; lost livestock; damage to fisheries; damaged irrigation systems; partially and completely damaged roads, bridges and culverts; disruption to economic empowerment groups; non-farm working days lost; increases in therapeutic feeding programs; and damages to wells, boreholes, piped water and hydrological stations. The agriculture sector represents almost half of these damages (48%), while transportation damages represent 46%. For food security analysis in Malawi, it is essential to go beyond the aggregate loss figures and focus on the impact of those crops most important for household food security – in Malawi, this is maize.

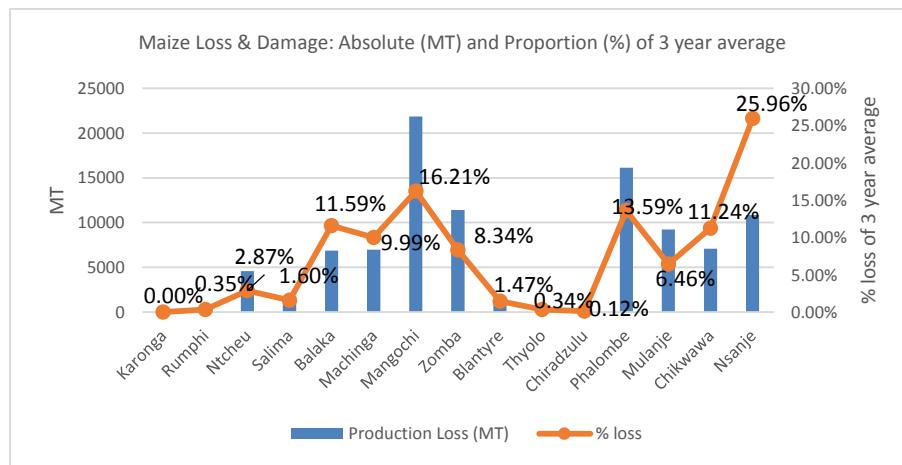


Figure 13: Maize losses and damages per district

food security recovery, given the cross-cutting nature of food security. The immediate and short-term requirements for food security include replenishment of the Strategic Grain Reserve, a market assessment to determine appropriate response modalities, expansion of school feeding programming to prevent malnutrition and encourage resumption of education activities and cash/food-for-work programs to rehabilitate flood affected land and repair damaged transportation infrastructure. These for-work schemes will support recovery/reconstruction in other sectors, while providing much needed cash/food support.

72. In the medium to long term, food security sector activities should focus on increasing household resilience to future shocks. Activities should increase farmers' access to markets through organizational capacity support and improving links with local markets. Also critical is nutrition sensitive homestead development, promoting nutrient rich crops and crop diversification, increasing diet diversification and reducing reliance on markets. Finally, expanding the warehouse receipt scheme is recommended; also recommended are providing poor agricultural households with access to credit and allowing them to leverage higher market prices later in the season. Of the total recovery needs, US\$ 12 million is included for the medium to long term programming.

71. Recovery Needs – MWK 57.9 billion (US\$ 133.2 million): While the damages affecting food insecurity are compiled from many sectors, the recovery needs listed here are food-security sector specific. However, the recovery plans in the related sectors are also essential for

Industry and Trade

73. Damage - MWK 1.1 billion (US\$ 2.5 million): The sector suffered damage to shops and other commercial establishments such as barber shops, hawkers, makeshift market structures and other equipment. Cooperatives and Village Savings Groups that were operating in the flood areas were reportedly rendered dysfunctional. In addition, group equipment and tools like cash safes, books were washed away by the floods.

74. Losses – MWK 3.6 billion (US\$ 8.3million): Trade, Commerce and Industry sector losses were incurred due to blackouts, disruption of water supply, disruption of transport services, soaking and washing away of stocks, restocking expenses, and destruction of industrial infrastructure. A number of roads and bridges were destroyed and firms reported temporary stoppage of production. Market places and shops in the flood areas were closed during the period of heavy rains and flooding. Business operations were disrupted due to the heavy rains and the floods. Business time was lost afterwards when some of the buildings were reconstructed, while in some cases the business operations completely stopped. Frequent blackouts were experienced due to machine shut down by ESCOM and disruption of water supply and telecommunication systems. Moreover, a number of people from severely flooded areas were placed in camps and remained economically idle for some time. Even cross-border trade was affected in Mulanje, Chikhwawa and Nsanje districts. Firms incurred heavy costs when they turned to running electric generators whenever electricity supply was disrupted. Some enterprises opted for more expensive alternatives of water supply such as sinking boreholes. Disruption of telecommunication infrastructure also affected business operations. Some firms opted for alternative but expensive transport routes and means to move raw materials and finished products. Enterprises that depended on MSMEs for the supply of raw materials were affected when supply chains were disrupted.

75. Recovery needs MWK 0.3 billion (US\$ 0.7 million): Estimates of the cost of the interventions aimed at recovering the SMEs in places affected by the heavy rains and floods are put at MWK 201 million (US\$ 0.5 million) for capacity building and MWK 100 million (US\$ 0.2 million) for an informal enterprise survey.

76. Reconstruction needs MWK 1.1 billion (US2.5 million) for reconstruction and rehabilitation SME properties and markets infrastructures.

77. The following recovery strategies are suggested for the sector to recover from the impact if the floods:

- Provision of loans: Loans would enable micro-enterprise owners whose shops collapsed or were washed away to rebuild and restock their inventories.
- Training: There will be a need for a training program in business management skills in order to ensure that loans beneficiaries do have the necessary knowledge and skills to run businesses efficiently and to repay back their loans.
- Reconstruction of Community Markets: A program should be established to reconstruct community markets that were destroyed.
- Building Baseline database for Small-scale Industry Establishment: There is need to build a database of local industries for use in policy analysis and possible future interventions aimed at understanding and developing the MSMEs sector.
- Support for Market Linkages: A program is needed to help MSMEs to market their products in the short, medium and long term.
- Mobilization of Enterprises: Mobilization of villagers into cooperatives will be necessary.

Summary of Damage and Loss by Sector

Social Sectors



Social Sectors

Education

78. Damage – MWK. 5.4 billion (US\$ 12.4 million): Some 461 of 2,662 public sector schools in Malawi are currently estimated to have been affected to varying degrees by the floods; these are predominantly rural schools except for Blantyre and Zomba Cities where few urban schools were also affected. Included in this total are primary and a few secondary schools and Teacher Training Colleges (TTC). Primary schools constitute the majority of this total at 446 schools (or 96.7%) compared to 15 (or 3.3%) that comprise of secondary/community day secondary schools, TTCs and Teacher Development Centers (TDCs). Thirty seven percent (or 105 classrooms and teachers houses plus 725 toilets/latrines) of the damaged buildings will need to be rebuilt while the remainder will need to be repaired. Separately, 454 classrooms, 93 teacher houses and two toilets/latrines have suffered partial damage while 861 administration buildings, staff rooms, kitchens, feeding shelters, libraries and fences will need repairing. There were in total some 414,173 students in the damaged buildings. No loss of life has been reported among the students and staff. However, one teacher in Nsanje had lost a pregnant wife, a child and household property due to floods. At least 222 schools in the 15 districts acted as camps for the IDPs. It is evident, however, that a number of students, teachers and staff are suffering from emotional trauma and/or health problems caused in the aftermath of the floods. Schools hosting the IDPs have suffered damage regarding furniture, toilets, loss of play grounds including interruptions to teaching and learning materials and hygiene and sanitation issues.

79. Recovery needs – MWK 4.2 billion (US\$ 9.7 million): The most urgent requirement for education is the restoration of effective teaching and learning in all schools and those schools being used as temporary shelters for the IDPs. This would encompass the provision of temporary and semi-permanent alternative learning spaces and the repair of partly damaged schools, as well as the repair of education administrative structures. In addition, learning materials, furniture and school-based counseling programs for the traumatized would need to be provided. Teachers will need to be trained in psychosocial counseling for which manuals are on hand following the 2014/2015 disasters. The figure includes teaching, learning materials and furniture.

80. Reconstruction needs – MWK 5.7 billion (US\$ 13.2 million): Technical assessments to identify which schools are to be reconstructed and repaired and of the community's education needs and site-specific technology options are currently being undertaken by the MOEST systematic assessment team. In the medium to long term, the destroyed schools will have to be rebuilt and relocated to safer grounds involving, inter alia, the construction of classrooms, libraries, latrines, school feeding kitchens, feeding shelters and maintenance of water supply systems. Remaining partly damaged schools will need to be rehabilitated. Factored into the estimates for civil works in both the short and medium to long term are costs to make structures resistant to multi-hazard risks.

81. Recovery and Reconstruction strategies:

- Relocate 10 schools in Nsanje district and one in Mulanje to higher ground
- Repair and rehabilitate partially damaged school infrastructure in all 15 affected districts
- Replace damaged furniture in affected school and provide new furniture to relocated school
- Provide teaching and learning materials in disaster affected schools and camps in 15 districts
- Recruit temporary teachers for schools with increased enrolment due to floods

- Establish temporally school facilities for infant classes in displacement sites
- Build protection walls in schools in districts that are flood prone
- Provide psychosocial support to teachers and learners that are traumatized as a result of the floods
- Support development of district education recovery plans
- Provide trees seedlings to schools that are relocated and those in flood prone areas
- Develop and implement a comprehensive school safety framework
- Undertake comprehensive environmental assessment and implement environmental protection measures in rehabilitated and relocated schools
- Provide recreation materials and support sports activities for children in displacement sites and affected schools
- Coordinate with WASH, health and nutrition sectors to address health hygiene and nutrition issues in temporary schools, rehabilitated and relocated schools
- Relocate Makhanga CDSS in Nsanje district and one in Mulanje to higher grounds

Health

82. *Damage – MWK 0.8 billion (US\$ 1.76 million)*: The damage to public health services and infrastructure is not reported to be extensive. Most of the secondary health care facilities remained un-affected except for 2, which require rehabilitation. Out of 200 health facilities in the 15 affected districts, only 2 in Ntcheu district are reported to have been fully damaged and 17 partially damaged in the 6 districts of Thyolo, Mulanje, Phalombe, Ntcheu, Chikhwawa and Nsanje. All health offices survived the devastation. No vehicle is reported to have been damaged. Data on damage to equipment and furniture in partially damaged facilities were collated and valued. Only one CHAM facility in Nsanje was affected and this has been valued among the damage.



Photo 4: Flooded Public Facility

83. *Losses – MWK 4.6 billion (US\$ 10.5 million)*: Provision of essential health services to affected communities was made by instituting temporary clinics at affected centers and mobile clinic teams were deployed to reach out to other under-served groups. In addition, health services were temporarily increased through mobilization of additional personnel, health promotions, vector control, disease surveillance, coordination and provision of SRH services for women and health. However, access to health facilities in the majority of the affected districts has remained normal and there has not been a major increase in outpatient attendance since the displaced population has remained in their catchment areas. This is not the case in the Lower Shire where flooding was vast and people had to be relocated to camps far from affected locations. The burden of flood related diseases has been manifested in some districts. Cholera has been reported in Nsanje and Chikhwawa within a month after the floods. Affected communities whose houses were washed away are at high risk of malaria because they lost their mosquito nets, and diarrhea because of insufficient hygiene at camps. The indirect costs (losses) were estimated at MWK 4.6 billion (US\$ 10.5 million).

84. *Recovery needs - MWK 4.4 billion (US\$ 10.1 million)*: The short-term strategies should address the immediate health care needs of the population and prepare the ground for planning and implementation of medium and long term strategies. The short and medium term strategies

should include: (i) provision of temporary health facilities to the affected population, (ii) cost of temporarily increased health provision including increased staff and medicine costs, support for referrals for pregnant women and those needing admissions and reimbursement of referrals costs to CHAM facilities, (iii) cost of coordination of disasters, supervision and early warning systems as well as health information systems, (iv) cost of interventions above normal to mitigate related risks, which includes costs for immunization, vector control, disease control, health promotion and costs for the health management of Gender Based Violence (GBV) and Violence Against Women (VAW) and provision of SRHR services to women and girls as well as psychosocial care of affected population.

85. Reconstruction needs – MWK 1.9 billion (US\$ 4.3 million): The already weak health care delivery system already required a very strong support to deliver quality health care. The short and medium-term reconstruction strategies should, therefore, support comprehensive health sector activities aimed at the overall needs of the health sector to deliver effectively and efficiently and in particular to rapidly restore the delivery of quality health services to the affected population. The strategies should cater for the provision of minimum standards for health care based on the key principles of equity, access to essential health care, timeliness, results and accountability. They should target women and children who are most vulnerable. Apart from reconstruction and equipping of the health facilities, the medium to long term plan should draw attention to chronic issues related to the health service delivery such as inadequate staffing, continuous supply of essential drugs, low utilization, quality of care, health care financing, managerial capacity building and functional referral system. The long term plan should also consider strengthening and continuation of an epidemiological surveillance and emergency preparedness and disaster relief system.

Nutrition

86. Nutrition situation analysis before the floods: The Integrated Context Analysis (ICA) estimates that nearly 1.8 million or 13 percent Malawians are unable to meet food needs on a regular basis (WFP 2014). Consequently, even in good years, Malawi struggles with high rates of under nutrition despite various efforts to tackle the problem, for many years.

87. Methodology: To ascertain the effect of the floods on nutrition, a decision was made to assess the performance of the CMAM program components using admissions only in line with SPHERE standards¹⁷. The CMAM program is a nationwide system that collects routine data on admission, which can be used as an early warning indicator of deteriorating nutrition status. CMAM collects comprehensive information on Out-patient Therapeutic Programme (OTP), Supplementary Feeding Program (SFP) and information from Nutrition Rehabilitation Unit (NRU). This information was collected from all the 15 affected districts. A nutrition cluster team comprising three members visited the treatments sites in the districts to collect data on new admissions in the month of January 2015 and compared it to data from January 2014. Data collected from the treatment sites were validated with data from the district health management information system (HMIS), district information systems (DIS) and CMAM databases. The January 2015 admissions data were compared with the January 2014 admission data to see if there were any major differences between the two time periods.

88. Across the three CMAM programs, outpatients, nutrition rehabilitations and supplementary feeding programs, the following observations are evident:

¹⁷ SPHERE is a set of minimum standards in humanitarian charter expected in key lifesaving sectors and a consensus as a best practice in Humanitarian response (2009)

- Compared to last year same time, admissions have increased across all three programs for both severe (<-3 standard deviations) and moderate malnutrition (<-2 standard deviations).
- The incidence rate of 1.5 in the Nutrition Response planning scenario, set at emergency level has been surpassed, indicating that there are a far higher number of children seeking treatment- within the first month of the emergency. This scenario is expected to further deteriorate if not stabilized
- Consistently, the most affected districts are Chikhwawa, Zomba, Machinga, Mangochi, Blantyre, Mulanje, Nsanje and Balaka and are performing poorly across all indicators
- Overall capacity for provision of services remains a challenge for most facilities due to destruction of systems and services leading to limited community mobilization and case finding to capture the children early

89. *Outpatient Therapeutic Programme (OTP): Before the floods, there was an average increase of 12.3 % in the OTP admissions in the last quarter of 2014.* This comparison was made against admissions data of the last quarter of 2013. Out of the 15 districts, for 2015, same month, Chikhwawa and Nsanje registered doubled admissions as high as 96.6% and 97% respectively. This finding is not surprising bearing in mind that these are categorized as the worst hit by the disaster. 3,565 children will require outpatient treatment services. According to Buchman 2009, treatment cost for a severely malnourished case is estimated at \$ 20¹⁸. Therefore, the economic losses accrued as a result of the increase in admissions in OTP program in the month of January 2015 amounts to MWK 16, 800,000.00 (US\$38,620.69). It is estimated that the situation will be stabilize to previous or same level of admissions by the end of 4 months. Taking into account this estimated period, total projected financial loss in the 4 months period (up to May 2015) (up to May 2015) is MWK285, 171, 468.29 (US\$655,566.60).

90. *Nutrition Rehabilitation Unit Programme (NRU): Nutrition Rehabilitation units are lifesaving service requiring hospitalization.* Admissions data in the last quarter of 2014 (pre-disaster period) shows an average decrease of 5.9% compared with 2013 data. A further downward trend of 24.7% in admissions was observed in the month of January 2015 implying that there were fewer cases admitted into NRUs. This scenario matches with the Nutrition Response plan where facilities were destroyed and children could not access the health facilities because of a breakdown in the provision of services and distances to where facilities were functional. Despite this average decrease, some districts such as Chikhwawa, Zomba, Balaka and Blantyre reported increases in the functioning NRUs and admissions increased overall compared to December 2014 data.

¹⁸ This cost includes human resources, cost of supplies, and transportation.

91. From a financial point of view, there are no apparent service losses incurred in the NRU program compared to the other OTP and SFP programs due to inaccessibility to facilities. The mortality loss is unknown in absence of a population survey. Independently treating the January 2015 admissions data at the expected incidence of 1.5, 1,751 children would require NRU services. The current flooding situation could have led into losses amounting to MK12, 852, 000.00 (US\$29,544.83). Projecting four months ahead, the total losses by May 2015 would be MK140, 090, 513.22 (US\$322,047.16).

92. Supplement Feeding programs (SFP) treats moderate acute malnutrition. During the last quarter of 2014, the SFP registered an average increase of 25.6% in admissions. The month of January 2015 shows that admissions increased by 58.3% on average suggesting a precarious situation in the SFP program.

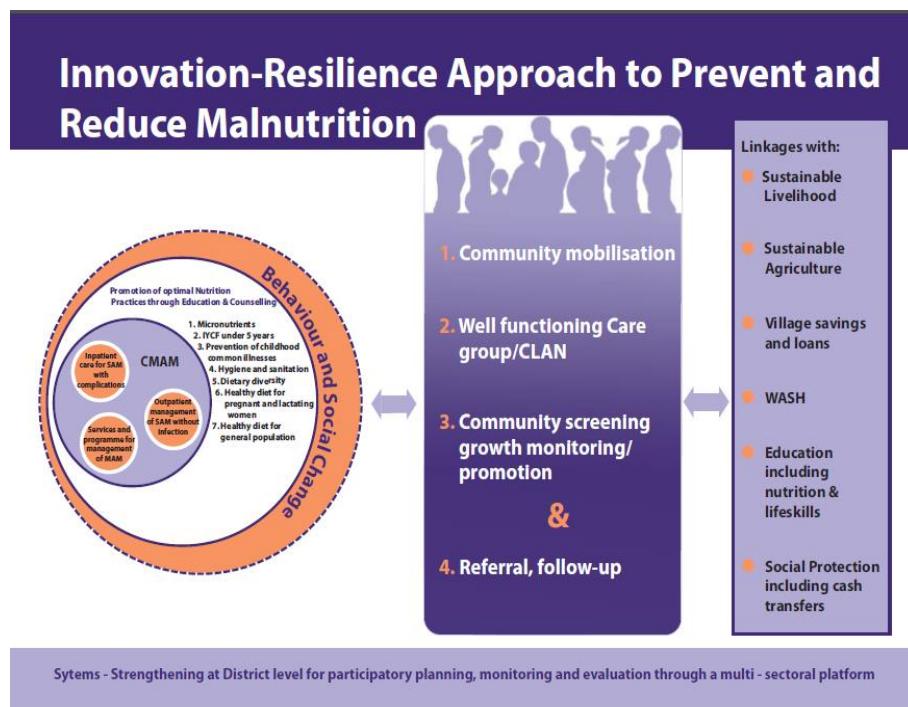


Figure 14: Resilience Approach to reduce malnutrition

districts. This finding could be attributed to poor screening, case identification or failure to access the services.

93. *Losses – MWK 1.4 billion (US\$ 3.3 million)*: The fifteen districts are expected to reach 20,000 children using the WFP's treatment cost of US\$ 50 for every case treated in SFP, it is estimated that the SFP incurred a total loss of MWK 34.9 million in the month of January. Projecting the same to May 2015, the estimated financial losses will be MWK 1 billion. Total financial losses in the CMAM programme: The total loss in the nutrition programme (SFP and OTP) in the month of January amounts to MWK 47.8 million and the total projected loss up to the month of May 2015 adds to MWK 1.1 billion (US\$2.5 million). With the assumption that the NRU programme might experience more admissions in the projected four month period, the total loss is MWK 1.4 billion (US\$ 3.2 million)

94. *Recovery needs - MWK 5 billion (US\$ 11.4 million)*: This account for dietary diversification, improved micronutrients intake for under five children and lactating mothers, food, water sanitation and hygiene, management of acute malnutrition and coordination.

95. *The following key strategies have been recommended in the Draft Nutrition Recovery plan as key to prevent deterioration of nutrition*. The Recovery plan is premised on the fact that; i) the nutrition situation in Malawi was already fragile even before the floods and could further deteriorate if not addressed, ii) the floods overlapped with the lean season in the affected

districts. This finding could be attributed to poor screening, case identification or failure to access the services.

districts. This finding could be attributed to poor screening, case identification or failure to access the services.

districts, and iii) the pre-existing high burden of diseases, malnutrition and food insecurity further raises the risk of mortality.

- Prevention and protection against the deterioration of nutritional status of the affected population;
- Supporting the scale up of the national nutrition education and communication strategy to promote key family child practices including IYCF, WASH and dietary diversity
- Continued identification, treatment and management of malnutrition among high risk groups (infants, children, pregnant and lactating, PLHIV, etc.)
- Strengthening nutrition coordination to foster resilience through linkages to nutrition sensitive sectors
- Implementing a nutrition surveillance system which includes conducting nutrition surveys, maintaining MVAC and CMAM Databases and active case finding data.

Housing

96. Damage – MWK 59.3 billion (US\$ 136.4 million): Data from respective districts at the time of the assessment indicate that 356,643 housing units were completely destroyed in the affected districts. Approximately 82% of the houses completely destroyed were traditional houses constructed mainly in rural areas with limited land use planning and little compliance with safer construction house design standards. The total value (replacement cost, not depreciated) of the housing (completely destroyed and partially damaged), kitchens, and household effects lost in the affected areas is US\$ 203.2 million, based on the original form in which the house existed before the disaster occurred. Material quantities and construction costs were estimated for the value of houses as they existed prior to the disaster.



Photo 5: House damaged by heavy storm

point when the houses are rehabilitated.

Material quantities and construction costs were estimated for the value of houses as they existed prior to the disaster.

97. Losses – MWK 1.1 billion (US\$ 2.5 million): The loss in the housing sector covers for the rental losses experienced. Most of the houses were destroyed in cities and trading centres thereby the house owners lost gain in rental income until the

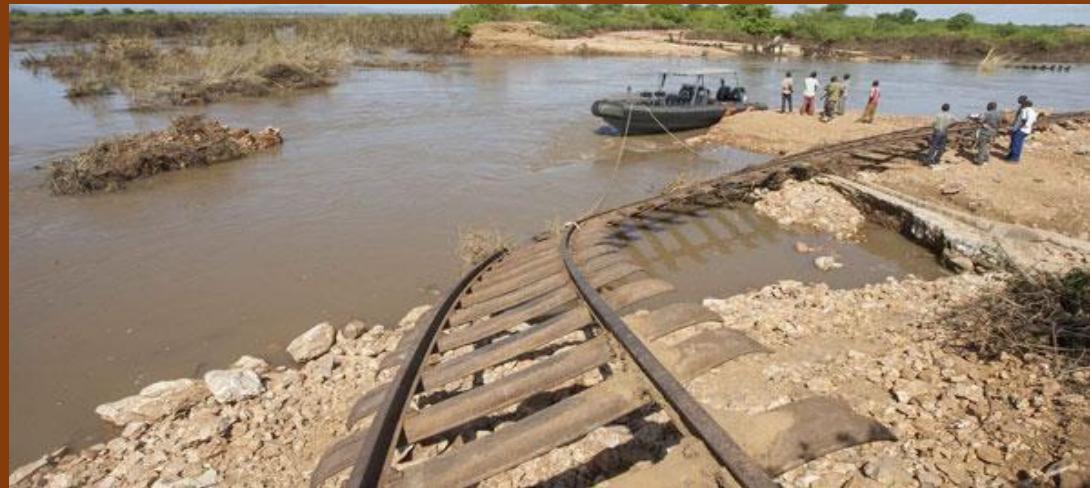
98. Recovery needs – MWK 2.1 billion (US\$ 4.8 million): Proposed recovery actions include the promotion of techniques in better and safer housing construction and information sharing as provided in the safer construction guidelines coupled with the provision of technical assistance and training to those who are keen to build back better voluntarily including local artisans and self-builders. In addition, there are numerous relevant acts and policies dealing with resettlement, land use and security of tenure requiring approval and adoption that once approved will need to be printed and implemented. Malawi has a high urbanisation rate while planning (e.g. DRR inclusive designs, building standards, waste management and zoning) is lagging behind, contributing to higher future disaster risk.

99. Reconstruction needs – MWK 74.1 billion (US\$ 170 million): The affected area is multi-hazard (floods, windstorms, and earthquake) prone and ideally reconstruction of houses should be based on acceptable structural standards with appropriate hazard-resistant features incorporated and in suitable locations that are less vulnerable to flooding. The current

calculations in the Housing Sector cover 35% of the cost of the reconstruction of all damaged housing using new buildings for the most vulnerable among the affected (gauged at 35%) and would incorporate storm and standing water resilience but not include earthquake resilience. While this would increase reconstruction costs, it still makes ample economic sense when viewed from a longer-term perspective.

100. *As part of the stabilization process leading to recovery, the emergency shelter costs, shelter-related non-food items and the costs of transitional shelter have been included in the recovery costs.* Moving forward to recovery, the actions identified for successful recovery include:

- Risk profiling and mapping of areas of return, integration and resettlement;
- Community sensitization and mobilization through participatory planning and community action for example using the Participatory Approach to Safe Shelter Awareness (PASSA process);
- Establishment and updating of contingency planning for cities and districts;
- Advocacy for funding and adoption of build back better and safer techniques;
- Promotion of appropriate technology using locally available materials and affordable techniques;
- Land use and site-planning;
- Promotion of the ‘living with floods’ concepts; and
- Resettlement support through planning and coordination.



Summary of Damage and Loss by Sector

Infrastructure Sectors



Infrastructure Sectors

Transport

101. *Damage – MWK 21.9 billion (US\$ 50.4 million):* The main damages were to physical assets such as highways, roads, bridges, culverts, drifts and railways. In Highways/Roads sector, there is 70% of the internal freight traffic and 99% of passenger traffic. The country's classified road network comprises 15,451 km of which about 28% is paved with the rest being unpaved and mostly built of earth. The road network is divided into 5 categories: main (3,357km), secondary (3,125km), tertiary (4,121km), district (3,500km) and urban (1,348km) roads. The main, secondary, and tertiary roads effectively make up the country's primary road network with district and other undesignated roads acting as a feeder system to the primary network. However, a reclassification study carried out in 2006 also identified a further 9,478 km of undesignated road network that serves rural communities. The Railway line has reported damage to railway tracks in various sections, bridges and culverts and the total length of the affected tracks is 80km (10.03% of the total rail track in Malawi). The total estimated cost of restoration for railway track, bridges and culverts is MWK2.3 billion (US\$ 5.2 million).



Photo 6: Damaged Road Infrastructure

Table 6: Damage on Road Infrastructure

Damage Extent	Bridges			
	Roads (Km)	(#)	Culverts (#)	Drifts (#)
Partially damaged	876.5	64	153	331
Totally damaged	344.03	121	312	1009
Total	1220.53	185	465	1340

102. *Reconstruction needs – MWK 46.2 billion (US\$ 106.2 million):* In summary, approximately US\$ 10 million will be required for short term (3 to 12 months) rehabilitation needs covering restoration of primary access and making the communication links usable. It is estimated that approximately US\$ 106.2 million will be required for the complete rehabilitation and reconstruction of all secondary and tertiary links.

103. Key elements of reconstruction strategy for restoration and rehabilitation of damaged infrastructure in communication sector include:

- Protection against further damage;
- Mobilization of adequate resources for immediate restoration of vital communication links;
- Commissioning of comprehensive surveys and studies for planning and prioritization of reconstruction works;
- Creating opportunities for the local communities in restoration works;
- Reviewing and supplementing the institutional capacities;

- Involvement of public and private sector in achieving the reconstruction targets; ensuring the availability of required resources and inputs;
- Selection of appropriate technology for timely delivery;
- Formulation of a comprehensive disaster management strategy at all management levels; and
- Assessment and mitigation of environmental and social impacts.

Energy

104. *Damage MWK 151 million (US\$ 347,000)* - The flooding disaster of January 2015 caused little damage to the electrical power system in relative terms. However, the nature of the damaged parts made the restoration very costly. Some Intake screens and channels were either swept away or dislodged from their positions and twisted. The other screens were buried 8 meters deep. Trash, which included logs, reached the turbines. In the distribution network 307 poles, 11 transformer structures and 15 transformers were damaged. The damage caused to the power system was within the ability of the utility company to restore and the system has since been restored apart from one area (Makhanga) in Nsanje which is inaccessible due to poor road network.



Photo 7: Damaged ESCOM Infrastructure

105. *Losses – MWK 306 million (US\$ 704,000)*: Losses resulting from loss of revenue, running a 1.1 MVA generator in Mzuzu to optimize supply and improve system voltage and activities towards restoring the damaged parts of the system amounted to MWK 306 million (US\$ 704,000) The average downtime for the whole power system due to the effects of the flood was 14 days.

106. The disaster has reinforced the obvious need for the country to diversify its power sources away from hydro and in case of hydro itself away from the Shire River besides intensifying its environmental management affairs in the catchment area. For the utility company, the disaster has reinforced yet another obvious need to have effective monitoring and control systems in place at its intakes together with operational dredging equipment that match the sizes of the respective ponds.

107. *Recovery needs – MWK 1.1 billion (US\$ 2.6 million)*: A proposed intervention to help the affected households reduce their suffering in terms of meeting their energy needs is procurement and distribution of improved cook stoves and solar lanterns for cooking and lighting respectively. The cost of this intervention is estimated at MWK1, 120 Million (US\$2.6 Million).

108. *Reconstruction needs – MWK 250 million (US\$ 575,000):* This cost is for installing automated intake monitoring and control systems.

109. *The following mitigation strategies are suggested for the sector to recover from the impact if the floods and at the same time to increase the resilience of the sector to floods:*

- Install automated intake monitoring and control systems at intakes. This will help monitor and control effectively water levels and status at the intakes;
- Acquire and operate dredging equipment at the three main Hydro power stations on the Shire River. This will restore pond capacity and also help improve quality of generation water desired to reduce wear of underwater generation machine parts;
- Develop hydropower stations from rivers in other geographic locations. This will provide the nation with alternative generation sources;
- Develop power stations from sources other than hydro-electric dams;
- Increased awareness on the effects of deforestation and bush fires and re-afforestation;
- Intensify the search for affordable alternative sources of fuel for low income earners who constitute a majority of the population;
- Procure and distribute cook stoves and solar lanterns to displaced households to ignite interest in environmental management best practices.

Water Supply, Sanitation and Hygiene.

110. *Damage – MWK 8.2 billion (US\$ 18.9 million):* The floods caused substantial damage to water supply facilities, hydrometric stations and dams in the affected districts. In these districts a majority of the affected water supply facilities were based on groundwater including boreholes, shallow wells and water supply systems which includes the intake structures,

treatment plants, conveyance systems, storage system and distributions networks. The damaged facilities included public schemes constructed and maintained by the water boards and community schemes constructed by the communities with the assistance of NGOs, churches and other organizations, operated and maintained by the communities themselves. In all the 15 affected districts 2,991 boreholes, 493 shallow wells, 36 water intake structures, 6 water treatment



Photo 8: Flooded Water Point

plants, 9.4km of water supply conveyance pipeline, 8.1 km of water supply distribution network, 15 hydrological stations and 4 dams were damaged either partially or totally. Damage to sanitation and hygiene facilities was substantial but the quantification in terms of the total cost is not known. These facilities include septic tanks, hand washing facilities, kitchens and bath facilities.

111. *Losses – MWK 3.0 billion (US\$ 6.8 million):* The WASH sector losses were derived from the increased operation in supply of potable water which included increased treatment processes of the supplied water and mobile water supply to the areas where infrastructure was

severely damaged. Additionally, silt removal at the water reservoirs or intake points, loss of revenue of the water supplying institutions and construction of temporary sanitation facilities compounded the losses of the sector.

112. *Recovery needs - MWK 5.8 billion (US\$ 13.2 million)*: Needs for the sector includes sanitation and hygiene promotion, provision of relief sanitation facilities, provision of emergency water supplying mechanism (e.g. purchasing water bowsers).

113. *Reconstruction needs - MWK 20.0 billion (US\$ 46 million)*: For the Sanitation sector, the needs for rural Health and school sanitation facilities will require MWK 32.6 million (US\$ 75 thousand), rural housing sanitation facilities will need MWK 1.7 billion (US\$ 3.9 million) and the urban sanitation facilities and hygiene structures will require MWK 2.7 billion (US\$ 6.2 million). Reconstruction needs for water supply, sanitation and hygiene include repairs and replacement of components of partially damaged water supply system, reconstruction of fully destroyed water supply system, construction of shallow wells and boreholes, repair and rehabilitation of sanitation facilities schemes and construction of flood protection structures.



Summary of Damage and Loss by Sector Cross Cutting Sectors



Cross Cutting Sectors

Disaster Risk Management and Climate Change

114. *Damage – MWK 750 million (US\$ 1.7 million)*: DRM damage is a combination of other sector damage, that are captured in their respective sectors, but does capture the damage to dykes, riverbank protection and basic community based early warning systems. Disaster Risk Management is a cross cutting sector, in addition to the above damage, the damage total for this sector is a combination of damage data from other sectors, including: housing, transportation, protection, employment & livelihoods, nutrition, energy and WASH, that are captured in each of these individual sectors. The floods also damaged people's houses and household property. Standing and stored crops were also washed away and animals were lost. Parts of Early Warning Systems including hydrological and meteorological stations were damaged. Flood mitigating structures such as dykes and productive infrastructure such as those used for irrigation, livestock disease control and fisheries were affected. Other infrastructure such as roads and bridges was also damaged.

115. *Recovery needs - MWK 572 million (US\$ 1.3 million)*: The needs include development of national guidelines, facilitate joint planning, implementation and monitoring of program at the national level, support district councils to integrate DRM in district development plans; revamping, establishing and training CPCs; training national and districts stakeholders in the establishment and management of emergency operation centres; supporting districts with community based early warning systems; and scaling up community mapping and data preparedness exercises. DRM related legislation such as the DRM Act under review as well as the Land and Land Use Bills need to be enacted as a government priority.

116. *Reconstruction needs – MWK 980 million (US\$ 2.3 million)*: The most urgent requirement is the restoration of EWS and flood mitigation systems. A comprehensive assessment/post mortem of the 2015 flood Event will be conducted by DoDMA to feed into the next revamped contingency plan and will feed into the support to district councils to integrate disaster risk management in the District Development and Contingency Plans. Climate Change will exacerbate the frequency and intensity of hydro-meteorological events and will require enhanced flood mitigation measures including improved catchment area management. DoDMA will also attempt to address the gaps in the risk assessments conducted in the country whilst taking climate risks into account.

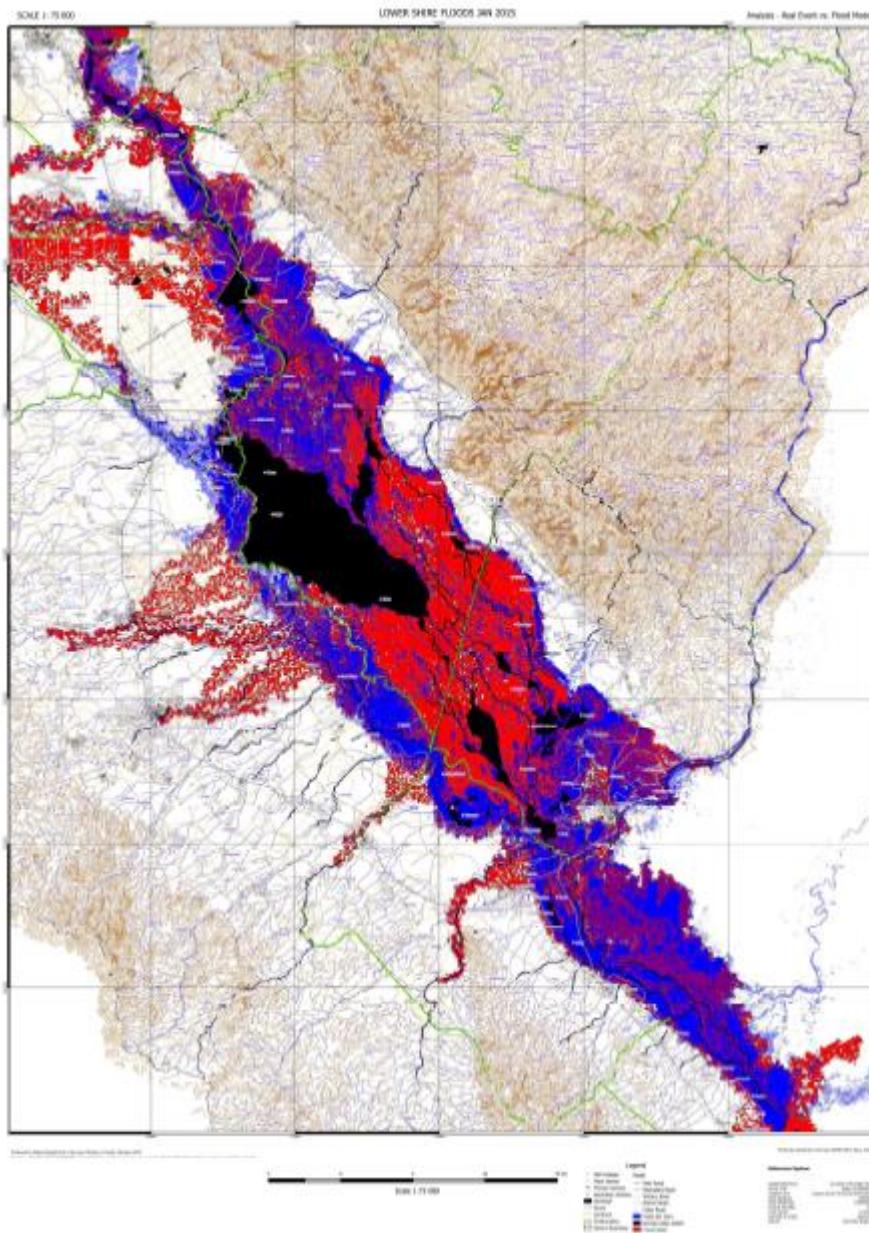


Figure 15: Actual Floods versus 1:500 Modelled Floods

building initiatives. Social infrastructure and relocation costs are not adequately captured in this assessment due to unknown parameters such as scale, availability of safe relocation sites and relocation distances are not yet known and needs to be further studied.

Employment and Livelihoods

118. *Loss – MWK 26.0 billion (US\$ 59.7 million)*: The loss amount accounts for the interruption of productive activities. About 89% per cent of the overall loss was recorded by smallholder households while the remaining 11% were recorded by non-farm household enterprises²⁰. Malawi's labor market is predominantly informal and overly dependent on the agricultural sector which provides employment to approximately 85 per cent of the workforce.

¹⁹ Figure 15, blue color presents the actual floods and the red color represented the modeled floods.

²⁰ Note that the income loss experienced by small holder households is already accounted for in the Agricultural sector assessment. The Employment and Livelihoods assessment accounts solely for the income loss of HHEs as this loss has not been taken into account by any other sector.

117. To mitigate future disasters at the 2015 scale (a 1 in 500 year flood)¹⁹, there is a need to significantly enhance the contingency plans and awareness of these plans at all levels in the short term as well as the identification of safe relocation areas with social infrastructure. Capacity of DoDMA at national and district level together with other DRM stakeholders needs to be enhanced. In the medium term an integrated people centred early warning system based on multiple hazards needs to be in place together with strengthened information management. A culture of safety in practices (e.g. housing, agriculture, WASH) will need to be instilled via community capacity

The informal sector employs a total of 89 percent of the workforce and the agricultural sector employs 64%²¹. The private and public sectors in Malawi remain underdeveloped and fail to provide employment opportunities for the majority of the population. In the absence of sufficient and substantive work opportunities, many households turn to entrepreneurship or self-employment to generate income through non-farm household enterprises in the informal economy.

119. *Across the 15 flood affected districts, an estimated 146,000 smallholder households and 33,800 non-farm household enterprises have been directly affected by the disaster.* The majority of affected small holder households and non-farm household enterprises are unlikely to be able to reconstruct and/or repair their farms, shops and homes until the beginning of May 2015 when the rain season is expected to stop.

120. Enabling small holder households and non-farm household enterprises to resume income generating activities as soon as possible while also increasing their livelihoods' resilience towards future shocks must be a key component of the reconstruction and recovery process. This requires a joint effort by national, district and traditional authorities, the private sector, civil society - including workers' and employers' organizations - and international agencies.

121. A comprehensive "Jobs for Resilient Livelihoods" (J4RL) strategy is proposed that consists of a "package" of interrelated downstream and upstream activities to bridge the continuum from immediate job creation to medium and long-term sustainability and disaster resilience at local level.

122. In the medium and short-term, the reconstruction process will be used as an opportunity for job creation through Employment Intensive Investment Programmes. Recovery and expansion of cooperatives and micro and small enterprises will be prioritized in the medium term to provide economic empowerment opportunities and to diversify the local economy. In the long-term perspective, action should be taken to Build Back Better (BBB) and to create resilient livelihoods. Such measures include enhancing the capacity of both institutions and communities to anticipate and cope with disasters in the future.

123. Based upon the assumption that 33% of the affected population are in need of livelihoods recovery, the initially estimated budget for the J4RL strategy amounts to \$24 million.

Protection

124. *Damage - MWK 1.7 billion (US\$ 3.9 million):* 1,233 of the 6,285 Protection Structures were either totally or partially damaged representing 15.2%. In addition, equipment worth MWK338.9 million was damaged. The equipment includes play material, furniture, gardening tools, and cooking and eating utensils. Protection services are provided through structures such as Community Based Child Care Centers (CBCCs), Children's Corners (CC), Victim Support Units (community and Police), One stop centers, Community Policing Forums, Community Based Organizations, Child Protection Workers, Social Welfare Offices, Alternative Care Centers, Health Facilities, Evacuation Centers, and Community Halls. Most of these structures are managed by community members who have also been affected by the disasters.

125. *Effect on Social Processes:* The immediate consequence of the disaster was damage of houses which left many people without shelter. During the PDNA visits to the affected districts, women reported that two to three families were sleeping in one small house as a result of the damage to their houses. As a result of this mix-up many married couples were no longer staying

²¹ NSO Labor Force Survey, 2013

together. This set up pre-disposes women, adolescent girls, children and other vulnerable groups to security risks, exploitation and abuse. The community policing forum provided some protection in selected areas; however, most places housing the displaced population were poorly lit, had bathroom and toilet facilities at some distance from the sleeping quarters. This required that women and girls wake up each other at night as a security measure. This set up undermines women's and girls' right to privacy and dignity. In some places, women and girls had to walk long distances to take a bath in the rivers for their special hygiene needs e.g. during their menses.

126. *The livelihood of the affected population has largely been destroyed.* As such, most of the vulnerable groups rely on piece work, small scale income generating activities and remittances. Women who engage in small scale income generating activities have also been negatively affected such that the savings from previous loans and capital for their businesses have been used up for food and other basic needs. In addition, the Village Savings and Loans and other economic empowerment structures are no longer operating effectively because many of the members are not able to buy shares and repay their loans.

127. *Effect on Availability and Accessibility to services:* Most of the protection services at community level rely on volunteers who have been also affected just like the other members of the community. As such, protection services such as early childhood development, psychosocial support, victim support, community policing and mobilization have been disrupted. For instance, PDNA visits observed that ECD caregivers had discontinued providing the services as they also wanted to receive relief food and engage in other income generating activities to support their families. Some protection service structures were being used as shelter for displaced people.

128. *Women, children and other vulnerable groups have been disproportionately affected.* For instance, in some communities it was observed that it was difficult to access some protection services such as ECD, Children corners, Community Victim Support Unit, Police stations and other services. It was further reported that women and children were failing to access other critical services such as health facilities, markets, water points, maize mills, and other important livelihood activities due to swelling of rivers and damaged bridges. However, in some areas arrangements had been made with nearby health facilities to give priority to displaced people upon the production of an introductory note from the camp chairperson.

129. *Effect on Governance:* As a direct effect of the disaster, some people had lost their personal identification documents such as voters' registration certificates, health passport books and business records such as VSL books. In some areas pregnant women and under five children had their health passports replaced at no cost; however, everyone else had to replace the books at a fee within the range of MWK 150 to MWK 200. In addition, as a result of relocating people in camps some village heads e.g. TA Kyungu in Karonga have lost control over their subjects. The core agenda of community development structures such as Village development Committees, Community Child protection committees were also disrupted.

130. *The disaster exposed women, girls and other vulnerable groups to new risks such as sexual abuse and exploitation.* The damage to property and means of livelihoods has overstretched the economic muscle of the affected populations. As such, as a coping mechanism, some people are engaging in risky behavior such as prostitution, thefts, dropping out of school, early marriages, and child labor. During the assessment it was observed that some people developed dependency on relief items including the unaffected population especially those around the relief camps. The dependency behavior is a risk in terms of development.

131. *Recovery needs – MWK 1.5 billion (US\$ 3.4 million).* The needs include establishing protection service points and recruitment of skilled staff in protection, strengthening cluster systems at district level using human rights investigation and monitoring systems; and supporting economic empowerment structures with conditional cash transfers.

132. *Reconstruction needs – MWK 1.7 billion (US\$ 3.9 million).* The needs include rehabilitation of the protection structures in the affected districts such as Community Based Child Care Centres (CBCCs), Children's Corners (CC), Victim Support Units (community and Police), One stop centres, Community Policing Forums, Community Based Organizations, Child Protection Workers, Social Welfare Offices, Alternative Care Centres, Health Facilities, Evacuation Centres, and Community Halls.

133. *Recovery and reconstruction strategies:* When coming up with the strategies, the sector took into consideration existing initiatives aimed at protecting vulnerable groups of people. The proposed strategies will strengthen the existing initiatives and provide improvements in the existing program i.e. improving the previous damaged structures. In the case of Economic Empowerment Processes, the estimated cost is aimed at protecting the most vulnerable and ensuring the rejuvenation of small scale businesses including Village Savings and Loans groups.

Gender Equality

134. *As a cross-cutting sector, gender is to be mainstreamed across all other sectors. This is due to the fact that disasters have different impacts on women, girls, boys and men.* They face different risks and have different capacities to respond and cope with disasters and emergency situations. In the aftermath of the flood disaster in Malawi, the highly affected people are mostly women and children. Women assumed enhanced roles in providing for their families and became leaders in their communities while some men took on extended roles in child care especially the ones whose wives died in the flood. This shift of gender roles should be recognized as it can provide guidance in the early recovery phase for the correct support and capacity building of the affected communities.

135. *It is, therefore, critical that gender is mainstreamed in every step of the PDNA in order to ensure that recovery interventions are relevant, effective and sustainable for women and men of the affected population.* Gender programming ensures that recovery efforts will reduce inequalities by avoiding stereotypes attached to women and men. Early recovery provides an opportunity to influence the direction of development patterns that, prior to the disaster, may not have placed enough attention on gender equality. It can identify opportunities to improve the capacity of the governments and communities to build resilience to reduce the risk of future disasters.

136. *A Gender Sector Recovery vision should be based on the development of the sector-specific recovery strategies and must also be relevant to women and men's realities in the affected communities.* There is need to ensure sector-specific gender programming on environment, health, nutrition, food security, shelter, WASH, employment, livelihoods and agriculture as well as gender equality references in the sector-specific development plans.

137. *When supporting the sector teams to integrate gender in the sector recovery plans based on gender analysis, the following points should be considered:*

- All sector recovery plans should reflect the sector-specific gender needs identified by the sector assessment team.
- Specific gender-targeted actions responding to the particular needs or problems facing women or men in the sector should be included in the Recovery Plan.

- Resource allocation of goods and services should ensure proportional distribution of benefits between men and women.

Environment

138. *Damage – MWK 1.6 Billion (US\$ 3.6 Million):* The heavy rains in December, 2014 resulted in extensive damage to crops, livestock, environment and natural resources. The PDNA conducted revealed that floods exacerbated environmental degradation and destroyed 7,150 ha of forest, 1,079 bee-hives, fertile land and water resources.

139. *Recovery needs MWK 6.3 Billion (US\$ 14.4 Million):* Since the environment is a cross cutting sector, concerted effort is needed for its rehabilitation. This requires putting in place measures to prevent future impacts of disasters on environment and natural resources by comprehensively addressing the linkages between environmental controls and agricultural, energy and irrigation practices. The floods also showed the importance of trees and wetlands and provided the opportunity to create absorptive basins, and government will strive to avoid creating the potential for devastating environmental damage by continuing to permit deforestation. Instead, the focus shall be on tree planting in key watersheds to decrease runoff, replenish forest cover and rebuild bee-hives. There is urgent need to work with the energy sector for improved cook stove adoption and solar lighting to avoid smoke and fumes in the homes.

140. *Cultural Heritage:* Each of the 15 affected districts has cultural heritage sites, and Mangochi, Karonga and the lower Shire have sites that are on the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Tentative List. A detailed assessment has not yet been undertaken but no reports of damage have been received at the Ministry of Tourism and Culture, Department of Antiquities.

Guiding Principles of the Needs Assessment and Recovery Strategy

141. The following guiding principles were used for this PDNA exercise which could also potentially be referred to in future PDNAs in Malawi:

- *Move from response to long term resilience:* It may not be viable for the government and its partners to continue to respond to all future disasters due to lack of resources in-country as well as diminishing resources from the international partners who prioritize the support to disaster and conflict worldwide. It is imperative that a long term solution focusing on disaster risk reduction is found for the recurrent floods in the area and to address long-term vulnerability and risks.
- *Government leadership and coordination:* Government-led coordination is key to effective implementation of the recovery and reconstruction programs. In a situation where there is a significant number of actors implementing different activities, a government-led coordinating mechanism is required to ensure the consistency in results delivery and coordinated and targeted efforts to meet needs and address gaps in programs.
- *Prioritize and sequence needs in the Recovery Framework:* The prioritizing and sequencing of needs across sectors must be done after internal prioritizing is complete within each sector. This must then be done at a cross-sector level through a consultative process which includes representatives from all sectors, ensuring that the needs of every sector is given due priority. Furthermore, a distinction must be made between what is urgent (must be done immediately) versus what is important (must be done regardless of time)²².
- *Build on lessons from past experiences in flood risk management:* Planning and prioritization for flood recovery should be based on sound lessons from experience and practices in Malawi while leveraging good practices in the region and worldwide.
- *Alignment with key disaster risk related policies:* There is a need for alignment and integration of recommendations with the National DRM policy and the Second Malawi Growth Development Strategy (MGDS II 2011-2016).
- *Community inclusion and use of local knowledge and skills:* This ensures the optimal use of local initiatives, resources and capacities. Planning and execution is based on local knowledge, skills, materials and methods, and enterprises, taking into account the need for affordable solutions. This principle further promotes community participation and ownership in all aspects of the recovery process and partnership with local institutions. It encourages decision-making concerning planning, designing and implementation at the lowest level possible to ensure community ownership and empowerment and to ensure that solutions are locally appropriate.
- *Give particular attention to socially disadvantaged groups such as children and people with disabilities.* Disasters increase the vulnerability of all but especially of those who are already disadvantaged. Recovery programming should give priority to the most vulnerable groups including female-headed households, children and orphans, and the poor; recovery programming should also take into account those with special needs. In addition, the World Bank and UN PDNA Guidelines Volume B on Gender Cross Cutting should also be taken into account when drawing up the recovery program for the mentioned population.
- *Secure development gains while differentiating between regular development and disaster recovery:* Recovery planning must attempt to re-establish and secure previous development gains, and areas not affected by the disaster should not lose out due to increased allocation of public resources to the disaster-affected areas. It must, however, be noted that while disaster recovery provides opportunities for improving the disaster resilience of affected

²² Note that detailed recovery framework and prioritization of recovery strategies across the sectors was not done under this PDNA. This is planned for the foreseen recovery framework development assignment.

infrastructure and assets, it should not include improvements or enhancements that fall under the purview of regular development. Sector strategies proposed in this report are essentially based on this dual principle of building upon existing development gains but not through recovery interventions that overlap with already planned or proposed development activities. Sector damage estimates and strategies must also, if possible, take into account any major setbacks in pre-disaster progress achieved towards the respective sector MDGs, and propose measures for bridging such gaps in the course of regular development. Sector strategies should also tackle disaster and conflict risks coherently to avoid development gains being undone. The strategies should transform the risks of conflict into opportunities for peace through integrating conflict sensitivity into early recovery and especially resettlement policies and strategies.

- *Build Back Better, Smarter and longer term disaster risk management:* While avoiding radical redesigning and restructuring, there is a need to ensure that realistic building back better measures are considered in the design of infrastructure to be rebuilt. This report attempts to propose building back better measures in each sector while being cognizant of possible resource shortfalls for the recovery process. Accordingly, longer term and potentially costlier disaster risk management interventions are included but accounted for separately in each of the sector needs assessments.
- *Strengthen capacities to manage the recovery process:* The capacity of local public administration including infrastructure must be strengthened. Along with local and national institutions, encourage and empower all levels of civil society to participate in and manage the recovery process. In this regard, the role of local governments needs to be given priority. It would also be important to mobilize private investment – both human and financial, by ensuring that the local private sector has incentives and technology to participate fully in reconstruction.
- *Strengthen institutions and their ability to manage risks:* Recovery efforts in the district should strive to strengthen existing institutional structures and build long-term capacity to manage disasters, particularly floods, drought and food crises.
- *Recognize the cyclical nature of the disaster and tackle it holistically:* There is a critical need to sustain the momentum for recovery with constant monitoring particularly due to the chronic nature of floods in the basin which are followed by droughts or when one part of the basin is affected by floods and other parts experience drought as this may exacerbate the current disaster for communities who are still in the process of recovering.
- *Prioritize service delivery support to local governments in the affected areas directly in the short-term and a program of capacity building over the long-term:* Even prior to the current disaster, affected districts had limited capacity to implement development programs. The disaster has only impacted this further and there is a need to assess and prioritize capacity development in these areas.
- *Maintain realistic recovery programming while exploring innovative and ambitious approaches for implementation:* Planning strategically and conservatively to ensure that there is sufficient capacity to undertake recovery tasks while developing innovative efficiency mechanisms.
- *Institutionalize disaster assessment and recovery processes:* Assessing current institutional arrangements including processes and procedures for recovery interventions and if necessary, review and streamline them or develop special dispensation for key recovery processes.
- *Develop a strong monitoring and evaluation (M&E) system to ensure that the course of recovery, reconstruction, and DRR activities get completed in a timely way:* An M&E mechanism must be used as a tool that brings together all the recovery, reconstruction, and disaster risk reduction initiatives that have been envisaged towards delivering results as a

coherent whole. The users and target audience of the performance management tools should be the managers of these programs and the projects that make up the recovery programs going forward.

- *Government should own and champion DRM:* Employing a dedicated body within the Government of Malawi to own and implement the results agenda for recovery, reconstruction and disaster risk reduction with adequate resources for its successful functioning.
- *Leverage existing capacities:* The capacity of existing M&E systems must be first assessed and any existing capacities and resources must be leveraged. Further, the capacities and resources of development partners' M&E must be assessed in order to ensure a harmonized M&E framework for recovery and to leverage synergies.
- *Focus on poverty reduction and sustainable livelihoods:* Ensure that the rehabilitation and reconstruction efforts are socially equitable with support targeted mainly to those in greatest need. Special measures should be put in place to ensure that vulnerable groups living in the flood affected areas such as landless farmers, tenants, and those in riverine areas where property rights are poorly defined fully benefit from the support measures to be provided through targeted outreach and monitoring.

Social Aspects



Social Aspects

142. *The 2015 floods has affected 1,101,364 people and displaced closer to 230,000 people and majority of them has lost their livelihoods.* However, it is the vulnerable people (sick people, HIV and AIDS infected people, widows, children, physically challenged, girls) who will suffer most as they cannot enter into labor market. Displacement means that the social cohesion is disrupted and self-help spirit of local villages is broken down. The floods have highlighted the plight of the rural poor, marginalized and vulnerable people in the 15 flood affected districts of Malawi. The scale of human suffering from the disaster was unprecedented and presents an enormous development challenge for the country.

143. *In rural areas, agricultural is the main source of employment and women provide the majority (70%) of labor force in agricultural activities.* Due to damage in the agriculture sector by floods, many women and other displaced people have lost employment opportunities on the one hand. On the other, the devastation caused by floods destroyed their few assets, worsened their personal security situation and changed their responsibilities as they are forced to respond to emergency conditions and needs. Field observations on selected camps indicated that women have limited access to primary health care as well as attendance to ante-natal services as in most camps such services are non-existent.

144. *The floods have destabilized the educational system in the flood affected districts where schools were closed and used as camps for displaced people.* The lack of livelihood systems opportunities for households and closure of schools in the 15 flood districts increase the risks of child labor, early marriages and human trafficking among the displaced people. Existing vulnerabilities are exacerbated and new vulnerabilities emerge as some new challenges occur due to loss of assets and social cohesion. A rights based approach to the recovery program can address such gaps.

145. *Displacement of people due to floods in the 15 districts has increased risks of spread and contraction of HIV and AIDS and other sexually transmitted diseases.* HIV and AIDS prevalence rates in the 15 flood affected districts is much higher than the national rate of 12 %. HIV and AIDS rates are higher in districts in the Southern Region (at 20.5 percent) and lowest in districts in the Northern Region (at 10.2 percent). In the flood-affected districts widows, school girls, migrant workers are among categories of people vulnerable to the transmission of HIV and AIDS and other sexually transmitted diseases. Recruitment of migrant workers is anticipated during both rehabilitation and reconstruction of public infrastructure. Extensive civic education and sensitization program on risks of spread and contraction of HIV and AIDS and other sexually transmitted diseases has to be carried out in all 15 flood-affected districts especially in the flood-affected areas.

146. *The impact of the disaster has been exacerbated by poor allocation of service and infrastructure. Therefore, the Resettlement Policy Framework (RPF) has to be prepared to guide possible land acquisitions and resettlement issues for the new sites of roads, bridges, schools, health centers, new sites for irrigation diversion canals and head works.* The RPF includes: (i) resettlement screening process; (ii) description of typical socio-economic impacts; (iii) eligibility criteria for compensation and methods of delivery; (iv) methods of valuation of the affected properties; (v) preparation of resettlement action plan; (vi) provisions for preparation of checklists on resettlement and training in resettlement exercises; (vii) mechanisms to minimize resettlements and restrictions to access assets; and (viii) resettlement monitoring systems.

147. *The Resettlement Policy Framework has to be a part of the National Disaster Recovery Framework.* This document would provide guidance on the mitigation of social and economic

losses among flood displaced communities. The framework must include measures to promote gender equality and a social inclusion policy to address the recovery needs of the disproportionately affected vulnerable/marginalized groups. In addition, the framework will provide guidelines for free and informed consultation with the communities ensuring community capacity building and participation, grievance redress, information disclosure and independent monitoring and evaluation.

148. *The screening process under Resettlement Policy Framework should consist of four steps:* (i) screening of the sub-projects and sites; (ii) assignment of resettlement categories and preparation of a resettlement action plan; (iii) review and approval of the resettlement action plan; and (iv) payment of compensations. The screening process will be carried out using a screening form as outlined in the RPF. The District Executive Committee under the supervision of the District Commissioner will carry out the resettlement screening. Monitoring, evaluation and reporting on resettlement issues will be part of a project implementation process and local authority reporting system. Compliance to resettlement screening will be generated from monthly reports, evaluation reports, feedback meetings and implementation support missions.

149. *In the context of emergency livelihood restoration programs for the flood displaced people,* the strategy must focus on the poor and the vulnerable groups so that they can cope with immediate effects of the disaster in the short and medium term. Livelihood restoration programs have potential to reduce persistent deprivation. Some of key recommended activities on emergency livelihood recovery activities are:

- Temporary employment replacement;
- Relief in cash and in kind;
- Enhancement of disaster recovery preparedness;
- Rebuilding livelihoods;
- Introduction of conditional cash transfer to serve as spring board for restoring use of health services and school attendance.



Environmental Aspects



Environmental Aspects

150. *The 2015 floods have caused wide ranging damage to different sectors of the environment.* These include the destruction of trees and shrubs, soil erosion and siltation of rivers and streams; accumulation of debris and solid waste in stream and rivers, siltation of fertile riverine areas used for winter cropping, loss of energy supplies (fuel wood), water logging conditions and poor sanitation conditions within human settlement areas and camps. Another set of negative environmental impacts are damage of essential service infrastructure such as of water supply facilities, electricity supply facilities, disruption of roads and community footpaths. Reconstruction and rehabilitation works have to address all these environmental challenges. The reconstruction and rehabilitation related to irrigation, transport, agriculture, health facilities and education facilities will generate some negative environmental impacts. In order to redress these risks, the environmental management framework has to be an integral part of the project planning process.

151. *Negative environmental impacts from operations of irrigation schemes and other facilities may include the following:* increase in water logging and salinization of land, increase in pests and diseases, conflict in use of water resources with upstream or downstream users and poor sanitation. In general, the extent and significance of the negative impacts will be localized and could be managed with appropriate interventions during the planning and implementation of sub-projects.

152. *To recover from the impact of this disaster and ensure adherence to proper environmental management activities, any activity planned should incorporate an environment management framework.* An EMF will provide screening procedures for typical anticipated environmental and impacts for all Project activities and the preparation of an Environmental Management Plan. The screening process will be part of the requirements in the design of sub-projects and will complement the National Environmental Policy and Guidelines for Environmental Impact Assessment (EIA) in Malawi (1997) which requires environmental and social screening for developments projects.

153. *The environmental screening process consists of four steps:* (i) review of environmental and social impacts checklist for projects; (ii) screening of impacts from the sub-projects and sites; (ii) assignment of environmental categories; and iv) preparation, review and approval of an environmental action plan. The screening process will be carried out using a screening form to be attached in the ESMF. A District Environmental Sub-Committee under the supervision of the District Commissioner will carry out the environmental and social screening.

Annexes

Annex 1: Agriculture Sector Analysis Tables

Table 7: Agriculture Sector Effects per District

District	Damage and Losses in million MWK							
	Crops		Livestock		Fisheries		Irrigation	Total
	Damaged	Losses	Livestock Damage	Losses	Damage	Losses	Damage	
Balaka	1,148	734	26	439	11	1	1	174 2,508
Blantyre	152	48	231	92	10	13	12	47 374
Chikwawa	2,770	854	75	314	2	3	3	623 4,569
Chiradzulu	61	19	2	30	-	-	-	24 134
Karonga	-	-	-	-	-	-	-	- 0
Machinga	1,372	526	47	374	10	-	-	114 2,396
Mangochi	2,760	1,093	36	305	1	2	1	502 4,664
Mulanje	1,972	564	102	681	23	3	3	66 3,312
Nsanje	2,534	674	460	2,469	15	517	3	504 6,716
Ntcheu	443	412	59	-	1	4	4	65 929
Phalombe	900	320	68	4	1	4	1	15 1,245
Rumphi	26	18	-	-	-	-	-	- 44
Salima	137	47	-	-	-	1	-	39 224
Thyolo	310	78	2	-	-	2	2	172 564
Zomba	1,346	401	13	19	-	10	10	98 1,884
Total	15,931	5,788	1,122	4,727	74	560	40	2,443 29,563

Table 8: Agriculture Sector Needs

Activities	Recovery Needs		Reconstruction Needs	
	In Million MWK	In million US\$	in Million MWK	In million US\$
Repair and reconstruction of irrigation systems			2,684	6.2
Provision of seeds (maize, sweet potatoes and cassava) and fertilizer for rain-fed production	5,412	12.4	10,200	23.4
Provision of farm tools and implements	1,863	4.3	1,377	3.2
Restocking of small and large animals	382	0.9	610	1.4
Repair and reconstruction of livestock infrastructure and equipment			4,726	10.9
Livestock vaccination and veterinary care for sick animals	1,832	4.2		
Parasite and vector control (ticks, tsetse flies, fleas)	658	1.5		
Repair and reconstruction of fishery infrastructure (ponds, boats and landing site)			134	0.3
Provision of inputs for fish capturing	379	0.9		
Provision of fingerlings to fish farmers	28	0.1		
Extension cost	206	0.5	385	0.9
Operation cost	1,076	2.5	2,012	4.6
Total	11,837	27.2	22,127	50.9

Table 9: Agriculture Sector prioritisation of recovery and reconstruction needs

Proposed Intervention	Short-term Up to 12 months	Medium term 1 -3years	Long term 3- 5 years upwards
Provision of seeds (maize, sweet potatoes and cassava) and fertilizers for second crop			
Provision of farm tools and implements (Hoes, panga knives, slashes, sickle)			
Livestock vaccination and veterinary care for sick animals			
Restocking of livestock targeting Rabbits, Indigenous chicken, Guinea Fowls and ducks			
Parasites and vector control (Ticks, tsetse flies, fleas)			
Provision of inputs for capture fishery (nets, hooks)			
Provision of fingerlings to fish farmers			
Repair and reconstruction of irrigation systems			
Provision of seeds (maize, sweet potatoes and cassava) and fertilizers for rain-fed production			
Provision of farm tools and implements (Hoes, Machetes, slathers, sickle)			
Restocking of small and large animals (goats, sheep, pigs and cattle)			
Repair and reconstruction of fishery infrastructure (ponds, boats, landing site)			
Repair and reconstruction of livestock infrastructures and equipment			

Note: the costs estimated for recovery interventions are all required in the first 12 months (beginning April 2015) while reconstruction costs are spread across a number of years.

Annex 2: Food Security Sector Analysis Tables

Table 10: Agriculture Sector Food Security Sector Background Data

District	Maize Hectares (HA 3 year avg)	Maize Production (MT 3 year avg)	Daily food energy consumption per capita (mean kcal)	Population with food-energy deficiency (%)	Rural Population below poverty line (%)	Food Sources: % purchase	Workforce main activity is agriculture, forestry, fishing (%)	Percentage of HH with non-improved drinking water source	Percentage of households with non-improved toilet facility	Percentage of under 5s with diarrheal episode 2 weeks before survey	Percentage of children 6-59 months with anaemia
Source of Data	Ministry of Agriculture	Ministry of Agriculture	CFSVA/ IHS3	CFSVA/ IHS3	CFSVA/ IHS3	CFSVA/ IHS3	WMS 2011	DHS 2010	DHS 2010	DHS 2010	DHS 2010
Karonga	28,965.33	57065	2034	47.5	61.7	47.41	88.5	13.1	96.9	11.4	52.6
Rumphi	17,187.00	42343	2496	34.8	37.3	48.07	85.4	13.6	94	16	58.1
Ntcheu	93,625.67	159775	2244	42.4	45.6	29.07	91	14.3	92.3	13.7	60.5
Salima	40,369.67	81280	2395	39	41.1	39.92	85.6	8.9	90.3	17.7	78.7
Balaka	53,798.00	59346	2031	48.6	67.7	34.63	74.5	11.3	91.7	13.4	70.4
Machinga	51,954.67	69964	1859	56	75	40.28	93.2	22.2	89.9	19	72.3
Mangochi	98,528.00	134873	1950	53.7	73.2	40.94	94.7	17.6	91.1	11.1	73.4
Zomba	84,987.67	136772	2066	50.1	56.6	48.83	92.9 (rural)	9.1	86.7	19.3	63.5
Blantyre	47,264.33	107424	2400	37	40	45.68	78.2 (rural)	10.1	83	16.1	43.5
Thyolo	50,657.33	130810	2444	34.9	36.8	48.22	78.3	32.9	94.6	15	49.1
Chiradzulu	31,890.67	62956	2403	35.2	43.3	40.96	67.8	11.4	96.7	16.8	46.3
Phalombe	44,830.33	118541	1756	59.1	64.5	56.88	88.5	9.3	95.4	24.8	60.7
Mulanje	62,130.67	142842	1830	57.8	65.3	56.77	86.1	9.3	93.7	19.3	59.6
Chikwawa	47,239.33	62876	1721	61.9	81.6	81.53	83.7	20.2	97.8	11.3	74.6
Nsanje	20,904.33	41800	1867	61.4	81.2	87.36	91.9	7.6	97.4	16.8	72.7

Table 11: Food Security Related Flood Damage: Summary Table

District	Agriculture: Crop Area Affected (Ha)	Agriculture: Maize loss (%)	Agriculture: Indigenous Chickens lost	Agriculture: Quantity of fish lost (Kg)	Agriculture: Irrigation Canals Damaged	E&L: Non-Farm income loss (MWK million)	Nutrition: Change in OTP in admissions (%)	WASH: Destroyed/ Damaged water supply facilities	Transport: Reconstruction Cost (MWK million)	Protection: Potential Loss Per econ. Empowerment group in 6 months
Karonga	-	-	-	-	-	28.9	-39.13%	1	103.9	1,250,000
Rumphi	104	0.35%	-	-	-	0.6	-51.61%	101	11.3	425,000
Ntcheu	3,510	2.87%	-	3,000	-	77.2	-66.47%	1	209.5	600,000
Salima	823	1.60%	8	136	220	8.9	-27.52%	1	203.2	250,000
Balaka	13,139	11.59%	903	650	2,060	186.5	0.00%	888	188.3	170,000
Machinga	9,390	9.99%	2,300	-	172	6.2	14.37%	118	243.1	125,000
Mangochi	22,568	16.21%	2,028	528	270	134.8	40.14%	666	293.0	175,000
Zomba	8,217	8.34%	1,546	20,720		370.6	31.58%	885	150.0	600,000
Blantyre	851	1.47%	8,832	4,750	20	860.3	57.50%	1,006	190.1	1,374,510
Thyolo	572	0.34%	-	1,404	30	254.6	-34.02%	224	914.3	600,000
Chiradzulu	209	0.12%	307	1,300	-	364.5	41.86%	1	1,331.1	600,000
Phalombe	2,995	13.59%	20,175	665	-	382.9	32.18%	95	329.1	600,000
Mulanje	7,364	6.46%	6,266	3,300	1,024	143.4	7.04%	7,618	418.9	600,000
Chikwawa	9,901	11.24%	4,463	330	31,750	85.7	96.58%	840	6,279.4	600,000
Nsanje	9,467	25.96%	47,953	1,440	11,230	423.1	97.87%	6,966	15,102.4	400,000
Totals	89,110	7.87%	94,781	38,223	46,776	3,328.2	13.36%	19,411	25,967.6	8,369,510

Table 12: Food Security Flood Damage

Flood Damage	Value in million MWK
Crop Losses & Damage	21,720
Livestock Losses	Assets: 4,726 Livestock: 1,122 Production:49
Damaged Fishing Equipment and lost fish	560
Irrigation Damage	2,443
Damaged/destroyed roads, bridges culverts and railway	29,44
Economic empowerment groups totally and partially disrupted, plus potential loss of savings over 6 months	8,620
Number of working days lost & value (non-farm livelihoods)	3,603
Outpatient Therapeutic Program (OTP) New Admissions	268
Damaged/destroyed bore holes, shallow wells, piped water, hydrological stations (est. 30% of total WASH damage)	81
TOTAL	64,024

Table 13: Food Security Sector Needs²³

Needs	Cost in million MWK	Cost in million US\$
Emergency Food Assistance	27,584	63.4
Replenishment of Strategic Grain Reserve	2,175	5.0
School feeding	822	1.9
Market Assessment	65	0.2
Cash/Food for work programs to rehabilitate flood affected land	11,046	25.4
Cash/Food for work programs to repair damaged transportation infrastructure	11,046	25.4
Farmer Access to Markets	1,578	3.6
Nutrition Sensitive Homestead Development	3,156	7.3
Expansion of Warehouse Receipt Scheme	467	1.1
Food Security Sector Total	57,938	133.2

²³ Interventions above normal budget allocations to mitigate disaster related risks

Table 14: Food Security prioritisation of recovery and reconstruction needs

Activity	Short-term Up to 12 months	Medium term 1 -3years	Long term 3- 5 years upwards
Emergency food assistance			
Strategic grain reserve replenishment			
Market Assessment			
School Feeding			
Cash/Food for work programs to rehabilitate flood affected land			
Cash/Food for work programs to repair damaged transportation infrastructure			
Farmer Access to Markets			
Nutrition Sensitive Homestead Development			
Expansion of Warehouse Receipt Scheme			

Annex 3: Industry and Trade Sector Analysis Tables

Table 15: Trade an Industries Sector Effects per district

District	Damage in million MWK	Losses in million MWK	Damages in thousand US\$	Losses in thousand US\$	Total in thousand US\$
Balaka	120.3	186.5	276.6	428.7	705.3
Blantyre	271.4	1,135.7	623.9	2,610.8	3,234.7
Chikwawa			69.4		
	30.2	85.7		197.0	266.4
Chiradzulu			122.5		
	53.3	364.5		837.9	960.4
Karonga			37.7		
	16.4	28.9		66.4	104.1
Machinga			159.8		
	69.5	6.2		14.3	174.0
Mangochi			175.3		
	76.3	134.8		309.9	485.2
Mulanje			134.3		
	58.4	143.4		329.7	464.0
Nsanje			134.5		
	58.5	423.1		972.6	1,107.1
Ntcheu			-		
	-	77.2		177.5	177.5
Phalombe			48.1		
	20.9	382.9		880.2	928.4
Rumphi			-		
	-	0.6		1.4	1.4
Salima			-		
	-	8.9		20.5	20.5
Thyolo			231.9		
	100.9	254.6		585.3	817.2
Zomba			482.6		
	209.9	370.6		852.0	1,334.5
Total	1086.0	3603.6	2496.5	8284.1	10780.6

Table 16: Industry and Trade Sector Needs

Activities	Reconstruction Needs in million MWK	Recovery needs in million MWK	Total in million MWK	Total in thousand US\$
Loans to enterprises,	1,000		1,000	2,298.9
Training		66	66	151.7
Community driven reconstruction of markets	99		99	227.6
Undertake an informal enterprises survey		100	100	229.9
Market linkages		100	100	229.9
Training and mobilizing communities into cooperatives		35	35	80.5
Awareness on insurance schemes				
National Total	1,099	301	1,400	3,218.4

Table 17: Industry and Trade prioritisation of recovery and reconstruction needs

Description of Initiatives	Short-term Up to 12 months	Medium term 1 -3years	Long term 3-5 years upwards
Loans to enterprises,			
Training			
Community driven reconstruction of markets			
Undertake an informal enterprises survey			
Loans to enterprises			
Training			
Market linkages			
Training and mobilizing communities into cooperatives			
Awareness on insurance schemes			

Annex 4: Education Sector Analysis Tables

Table 18: Education Sector Effects per District

Districts	Damage in Million MWK			Total MWK Million	Total Effects in Thousands US\$
	Infrastructure	T&L Materials	Furniture		
Balaka	98.90	5.39	25.96	130.24	299.40
Blantyre	192.90	12.16	25.63	230.69	530.32
Chikhwawa	767.93	83.96	56.83	908.73	2,089.03
Chiradzulu	47.99	3.53	10.53	62.06	14.27
Karonga	80.10	2.20	30.07	112.37	258.32
Machinga	201.85	13.61	50.19	265.64	610.67
Mangochi	797.91	4.20	28.69	830.79	1,909.86
Mulanje	336.27	44.30	105.23	485.80	1,116.78
Nsanje	621.00	35.77	101.78	758.55	1,743.79
Ntcheu	199.80	2.05	40.16	242.01	556.34
Phalombe	603.43	80.21	202.37	886.01	2,036.80
Rumphi	47.23	1.27	9.96	58.45	134.37
Salima	35.60	4.85	18.86	59.31	136.34
Thyolo	193.75	4.05	11.89	209.68	482.02
Zomba	50.10	1.51	97.56	149.17	342.92
TOTAL	4274.74	299.06	815.70	5,389.50	12,389.66

Table 19: Education Sector prioritisation of recovery and reconstruction needs

Initiatives for Reconstruction						
Subsectors	Description of Initiatives	Short Term	Medium Term	Long term	Estimated cost (Million MWK)	
Primary	Relocate 10 schools in Nsanje district and one in Mulanje to higher grounds	0	108.6	108.6	217.2	
	Repair and rehabilitate partially damaged school infrastructure in all 15 affected districts	2,190.46	2,190.46	0	4,380.92	
	Replace damaged furniture in affected school and provide new furniture to relocated school	271.9	271.9	271.9	815.7	
	Provide teaching and learning materials in disaster affected schools and camps in 15 districts	149.53	149.53	0	299.06	
	Recruit temporary teachers for schools with increased enrolment due to floods	52.11	52.11	0	104.22	

	Establish temporally school facilities for infant classes in displacement sites	674.44	674.44		1348.88
	Build protection walls in schools in districts that are flood prone			600	600
	Provide psychosocial support to teachers and learners that are traumatized as a result of the floods	42.81	42.81	0	85.62
	Support development of district education recovery plans	7.79	0	0	7.79
	Provide trees seedlings to schools that are relocated and those in flood prone areas	0	15	15	30
	Develop and implement a comprehensive school safety framework	0	3.89	3.89	7.78
	Undertake comprehensive environmental assessment and implement environmental protection measures in rehabilitated and relocated schools	0	13	13	26
	Provide recreation materials and support sports activities for children in displacement sites and affected schools	0.017	0.017		0.034
	Coordinate with WASH, health and nutrition sectors to address health hygiene and nutrition issues in temporary schools, rehabilitated and relocated schools	3.46	3.463	3.463	10.386
Secondary Education	Relocate Makhanga CDSS in Nsanje district and one in Mulanje to higher grounds	0	12.24	12.24	24.48
Total in million MWK		3,392.52	3,537.46	1,028.09	7,958.07
Total in million MWK plus 50%		4,240.65	4,421.83	1,285.12	9,947.59
Total in million US\$		7.80	8.13	2.36	18.29
Total in million US\$ plus 50%		9.75	10.17	2.95	22.87
Reconstruction (with BBB) in MWK					5747.65
Recovery (with BBB) in MWK					4199.94

Annex 5: Health Sector Analysis Tables

Table 20: Health Sector Effects

District/National	Damage (MWK Million)	Losses (MWK Million)	Total (MWK Million)
Balaka	0	61.01	61.01
Blantyre	0	635.41	635.41
Chikhwawa	23.35	679.13	702.48
Chiradzulu	0	51.45	51.45
Karonga	0	49.70	49.70
Machinga	0	47.80	47.80
Mangochi	0	49.05	49.05
Mulanje	143.12	297.47	440.58
Nsanje	113.25	921.90	1,035.15
Ntcheu	425.27	87.08	512.35
Phalombe	37.90	725.85	763.75
Rumphi	0	46.30	46.30
Salima	0	47.00	47.00
Thyolo	24.05	61.60	85.65
Zomba	0	711.74	711.74
Others	0	94.38	94.38
National Total (MWK million)	766.93	4,566.86	5,333.79
Total (US\$ million)	1.76	10.50	12.26

Table 21: Health Sector Needs per district

Districts	Recovery In Million MWK	Reconstruction in million MWK	Total needs in Million MWK	Total Needs in thousand US\$
Balaka	17.8	0	17.8	40.9
Blantyre	341.3	0	341.3	784.6
Chikhwawa	441.4	23.4	464.8	1,068.5
Chiradzulu	17.8	0	17.8	40.9
Karonga	17.8	0	17.8	40.9
Machinga	17.8	0	17.8	40.9
Mangochi	17.8	0	17.8	40.9
Mulanje	670.9	493.1	1,164.0	2,675.9
Nsanje	1,041.3	463.3	1,504.6	3,458.9
Ntcheu	843.0	825.3	1,668.3	3,835.2
Phalombe	451.9	37.9	489.8	1,126.0
Rumphi	17.8	0	17.8	40.9
Salima	17.8	0	17.8	40.9
Thyolo	41.8	24.1	65.9	151.5
Zomba	410.0	0	410.0	942.5
Total	4,365.7	1,866.9	6,232.6	14,327.8

Table 22: Health Sector prioritisation of recovery and reconstruction needs

Category	Activity Description	Short-term	Medium term	Long term	Total
		Up to 12 months	1 -3years	3- 5 years upwards	
	Total cost for replacement, refurbishing, upgrading, furnishing and equipping damaged health facilities		1,000	866.9	1,866.9
Demolition, rubble removal and cleaning, disinfection etc.	Demolition, rubble removal and cleaning, disinfection etc.	18.4	0	0	18.4
Temporarily increased health facilities	Semi temporary health facilities and tent clinics	1,920			1,920
Cost of additional coordination	Cost for coordination and disaster management including supervision	40	20	16	76
	Cost for early warning, surveillance and information systems	60	30	21.3	111.3
Interventions above normal budget allocations to mitigate disaster related risks	Costs related to health promotion and IEC	214	0	0	214
	Costs related to health management of GBV and services for women and girls including FP	150	27.5	0	177.5
Total (MWK million)		2,402.4	1,077.5	904.2	4,384.1
Total (US\$ million)		5.5	2.5	2.1	10.1

Annex 6: Nutrition Sector Analysis Tables

Table 23: Nutrition Sector Effects per district

District	Nutrition Rehabilitation Unit		Outpatient Therapeutic Program		Supplementary Feeding Program	
	Economic cost in million MWK Jan 2015	Total Projected cost in million MWK for the next four months	economic value in million MWK	Total Projected cost in million MWK for the next four months	economic value in million MWK	Total Projected cost in million MWK for the next four months
Chikhwawa	9.49	202.84	0.59	12.57	11.59	476.4
Phalombe	2.35	50.26	1.01	21.54	0.54	22.2
Rumphi	2.69	39.81	0.34	4.98	2.12	53.72
Zomba	4.03	59.71	0.42	6.22	10.26	260.62
Balaka	-		0.17	2.49	2.68	68.01
Blantyre	5.8	85.84	1.76	26.12	0.9	22.86
Karonga	0.76	11.2	0.84	12.44	1.28	32.58
Ntcheu	9.32	138.08	0.34	4.98	2.68	68.01
Nsanje	3.86	82.57	0.34	28.72	0.43	17.58
Mangochi	4.96	73.4	4.12	60.96	5.58	141.74
Machinga	2.02	29.86	1.51	22.39	7.7	195.46
Mulanje	0.84	12.44	0.17	2.49	0.02	0.57
Chiradzulu	1.51	22.39	0.08	1.24	1.13	28.58
Salima	2.52	37.32	2.27	33.59	1.04	26.29
Thyolo	2.77	41.05	1.43	21.15	1.64	41.72
Total	52.92	886.77	15.39	261.88	49.59	1456.34

Table 24: Nutrition Sector Recovery Plan

	OUTCOME	Needs in Million	Needs in million US\$
		Kwacha	
1	BCC related to IYCF; Food, Water, Sanitation and Hygiene -	1,475.76	3.39
2	Dietary diversification	188.16	0.43
3	Improved micronutrients intake for under-five children and lactating women	900.45	2.07
4	Management of Acute malnutrition	1,568.46	3.61
5	Coordination, Monitoring and Evaluation	839.99	1.93
GRAND TOTAL		4,972.81	11.43

Annex 7: Housing Sector Analysis Tables

Table 25: Housing Sector Effects per District

Disaster affected districts	Damage in Million MWK	Losses in Millions MWK	Total in Millions MWK
Balaka	936	12	948
Blantyre City	15,447	201	15,648
Blantyre Rural	3,213	76	3,289
Chikwawa	4,459	105	4,564
Chiradzulu	988	34	1,022
Karonga	45	2	47.10645
Machinga	48	1	49.34555
Mangochi	722	10	732
Mulanje	10,555	191	10,746
Nsanje	2,998	67	3,065
Ntcheu	436	6	442
Phalombe	7,098	131	7,229
Rumphi	4	0	4.23485
Salima	23	1	24.1345
Thyolo	559	47	606
Zomba	11,782	216	11,998
Grand Totals	59,313	1,100	60,414

Table 26: Housing Sector prioritisation of recovery and reconstruction needs

Activity	Specifications	Total MWK in Million	Total in million US\$
Short term			
Provision of Tents in Camps	2,100 tents provided @ \$US500 ea.	-	-
Provide shelter support to all the displaced to ensure access to shelter-related non-food items.	K20,000 for 557530	-	-
Provide transitional shelter at places of origin for the most vulnerable among those displaced	K50,000 each for 557,530 h/h printing and advocacy	1,610	3.70
Approve the National Housing Policy	printing and advocacy	20	0.05
Approve the Malawi National Land Use Policy	printing and advocacy	20	0.05
Pass the Land Bill	printing and advocacy	30	0.07
Finalize review of and adopt the Safer House Construction Guidelines	printing and advocacy	50	0.11
Perform risk profiling of places of origin of the displaced	3,000,000 per district	45	0.10
Provide emergency shelter in camps for those who cannot return to their place of origin and transitional shelter in relocation sites until integration or resettlement sites are identified and provided with adequate (social) infrastructure and support systems	MWK2,500,000 per district capacity building for returnees	20	0.05
Promote community mobilization through training in the participatory approach to safe shelter awareness (PASSA)	MWK5,000,000 per district All Civil protection committees per dist	38	0.09
Formulate/update city and District contingency plans (districts have contingency plans but cities do not)	MWK3,000,000 for each of 19	38	0.09
Carry out urban risk assessment and mapping, risk reduction through land use planning, safer building design and construction (compliance and enforcement	5,000,000 per dist	45	0.10
Total		1,916	4.40
Medium term			
Advocacy and capacity building programs on safer house construction including design, building materials, construction quality.	2,000,000 per district	30	0.07
Build capacity within communities to manage the process of adopting safer shelter construction principles aimed at reducing hazards and increasing the resilience of housing	train 300 per district at k2,000,000 per district	23	0.05

through training in the participatory approach to safe shelter awareness (PASSA)

Promote the use of affordable materials and appropriate technologies that will minimize the impact of housing on the environment.	1,500,000 per district	23	0.05
Promote the planting of trees as windbreaks at a suitable safe distance from properties – especially if able to be sustainably harvested for firewood or other uses	3,000 plants per district at 1,500,000 per dist per year	45	0.10
Risk sensitive land use planning to promote sustainable and safer human settlements.	500,000 per district	15	0.03
Promote the ‘living with floods’ approach in suitable areas.	5 model houses @ 1,400,000 per district	35	0.08
Total		171	0.39
Long term			
Housing subsidy for the poor to build back better and safer (this could be done by expanding the current Decent and Affordable Housing Program)	30% of 557,530 damaged houses for vulnerable households @K1,400,000.00	73,946.21	169.99
Provide settlement planning and shelter support to effect well managed integration and resettlement (in accordance with the DRM Policy, international conventions and expectations) in line with the Kampala Convention, the adopted durable solutions and sustainable livelihoods framework.	settlement planning activities at K 20,000,000 per district	98.42	0.23
Formulate the Re-Settlement bill to guide the integration and resettlement of displaced households	consultancy meetings and approved bill	98.42	0.23
Total		74,143.05	170.44
Grand Total			
		76,230.05	175.23

Annex 8: Transport Sector Analysis Tables

Table 27: Transport Sector Effects per District

DISTRICT NAME	ROADS						TOTAL MWK
	Primary roads	Secondary Roads	Tertiary Roads	District Roads	Bridges	Culverts/ Drifts	
Balaka	-	-	-	20.35	130	37.96	188.31
Blantyre	-	-	-	0.23	188.1	1.8	190.13
Chikwawa	-	5,730	29.4		114	406.1	6,279.48
Chiradzulu	-	-	-	-	1,318.50	13.4	1,331.90
Karonga	-	-	-	6.53	91.2	6.2	103.93
Machinga	-	-	64.26	44.51	123.5	10.8	243.1
Mangochi	19.8	-	16.5	-	210.9	45.8	293
Mulanje	-	2.94	30	63.9	292.6	3	418.9
Nsanje	2,800	4,700	39	43.2	7,500	20.2	7,609.90
Ntcheu	-	-	-	0.87	190	18.68	209.55
Phalombe	-	3.54		11.85	266	47.7	329.1
Rumphi	3	3	3.5			1.8	11.3
Salima	-		12		155.8	35.39	203.19
Thyolo	-	-	-	2.43	894.9	16.96	914.29
Zomba	-	-	21	65.3	1,132.40	120	1338.7
Total for Road Sub Sector							19,664.78
Rail Transport							2,275.87
GRAND TOTAL							21,940.65

Table 28: Transport Sector Recovery Needs per district

Districts	Roads				Bridges	Culverts	Reconstruction needs in million MWK	Reconstruction Needs in million US\$
	Primary roads	Secondary Roads	Tertiary roads	District roads				
Balaka				24.42	156	45.55	225.98	0.52
Blantyre	-	-		0.27	225.72	2.16	228.15	0.52
Chikwawa	-	14,286.00	35.28	-	136.8	487.29	14,945.37	34.36
Chiradzulu					1,572.60	16.08	1,588.68	3.65
Karonga				7.83	109.44	7.44	124.71	0.29
Machinga			77.11	53.41	148.2	12.96	291.68	0.67
Mangochi	23.76		19.8		253.08	54.96	351.6	0.81
Mulanje		35.28	36	76.68	351.12	3.6	502.68	1.16
Nsanje	7,000.00	11,750.00	46.8	51.84	15.00	24.24	18,887.88	43.42
Ntcheu								0.00
Phalombe		4.25		14.22	319.2	57.24	394.91	0.91
Rumphi	3.6	3.6	4.2			2.16	13.56	0.03
Salima			14.4		186.96	42.47	243.83	0.56
Thyolo				2.91	1,073.88	20.35	1,097.15	2.52
Zomba			25.2	78.3	1,377.12	144	1,624.62	3.73
Railway line-National							5,689.67	13.08
Total							46,210.47	106.23

Table 29: Transport Sector Prioritized Sector Recovery Needs

Activity	Short-term Up to 12 months	Medium term 1 -3years	Long term 3- 5 years upwards
Back filling of the scoured approaches and pot hole patching			
Launching of Bailey Bridges to open up access to socio-economic facilities and services			
Grading and reshaping unpaved roads			
Emergency maintenance and rehabilitating the damaged structures			
Promote proper land use planning			
Construction of protection works			
Construction of masonry lined side drains			
Routine maintenance and rehabilitation infrastructure			
Design and construct disaster resilient structures			
Multimodal transport system			
Upgrading unpaved roads to bituminous level			

Annex 9: Energy Sector Analysis Tables

Table 30: Energy Sector Physical Damage Details

District/ National	Unit (km/no/ etc.)	Power line structures (poles)		Distribution Transformers		Generation intake screens	
		Completely Destroyed	Partially Damaged	Completely Destroyed	Partially Damaged	Completely Destroyed	Partially Damaged
Balaka	no	75	0	4	0	0	0
Blantyre	no	44	0	0	4	6	0
Chikwawa	no	9	0	0	0	0	0
Chiradzulu	no	0	0	0	0	0	0
Karonga	no	0	0	0	0	0	0
Machinga	no	0	0	0	0	0	0
Mangochi	no	0	0	0	0	0	0
Mulanje	no	46	0	0	1	0	0
Ntcheu	no	0	0	0	0	0	0
Nsanje	no	47	0	0	1	0	0
Phalombe	no	0	0	0	0	0	0
Rumphi	no	0	0	0	0	0	0
Salima	no	0	0	0	0	0	0
Thyolo	no	49	0	0	0	0	0
Zomba	no	59	0	5	0	0	0
National Total	no	329	0	9	6	6	0

Table 31: Energy Sector Damage, Loss and Reconstruction needs (MWK)

Districts/ National	Damage MWK Million	Losses MWK Million	Total MWK Million	Reconstruction and Rehabilitation/Repair Costs (MWK) Million
National Values	151	306	457	277

Table 32: Energy Sector prioritisation of recovery and reconstruction needs

Activity	Short-term Up to 12 months	Medium term 1 -3years	Long term 3- 5 years upwards
Procure and distribute one cook stove to displaced	280		
Procure and distribute one solar lantern to displaced	840		
Installing automated intake monitoring and control systems at intakes	250		
Acquiring dredging equipment at the three main Hydro power stations on the Shire river		10,213	
Increase awareness on the effects of deforestation and bush fires. Re-afforestation. Affordable alternative sources of fuel			
Developing hydropower stations from rivers in other geographic locations.			
Develop power stations from sources other than hydro.			
Total (MWK million)	1,370	10,213	
Total (US\$ million)	3.1	23.5	

Annex 10: WASH Analysis Tables

Table 33: WASH Sector Effects per district

District	Damage in million MWK							Total
	Bore holes	Protected Shallow Well	Water intake structures	Water treatment plants	Conveyance System	Distribution Network	Hydrological Stations	
Balaka	283	15.4	-	20	97.2	-	-	415.6
Blantyre	594	35.35	-	-	60	-	-	23 711.85
Chikwawa	1,456	16.5	25	20	37.77	-	-	1555.27
Chiradzulu	22.2	-	5	-	-	-	-	27.2
Karonga	-	-	-	20	-	-	-	20
Machinga	-	-	25	20	166.72	55.85	-	267.57
Mangochi	80	0.4	5	45	154.44	9.79	-	294.63
Mulanje	761	10.6	60	-	181.89	646.5	4.2	1664.19
Nsanje	1,344	4.9	-	-	1004.43	-	7	2359.83
Ntcheu	110	0.3	5	-	100.93	31.71	1.2	249.14
Phalombe	71	1.6	-	-	72.28	-	4.3	149.18
Rumphi	-	-	5	-	75.74	-	-	80.74
Salima	-	-	5	-	-	-	-	5
Thyolo	74	0.5	25	-	-	24.98	4.3	128.78
Zomba	152	1.4	20	-	-	90.35	-	263.75
Total	4,946	87	180	125	1,951	859	21	23 8,193

Table 34: WASH Sector Losses

Activity	Loss in million MWK	Losses in million US\$
Water supply - Mobilise and operate plants (mobile water treatment plant and water tank truck) to affected areas.	2,920.19	6.71
Lost revenue due to ESCOM power outage	31.95	0.07
Increased production cost due to high turbidity of water during the floods period	3.00	0.01
Total	2,955.14	6.79

Table 35: WASH Sector Needs

Activities	Recovery needs	Reconstruction needs
WATER SUPPLY		
Construction of new boreholes		2,194,290,000.00
Rehabilitation of partially damaged boreholes		2,291,814,000.00
Maintenance of mildly damaged boreholes		1,154,034,000.00
Construction of new shallow wells		65,248,200.00
Rehabilitation of partially damaged shallow wells		33,262,650.00
Maintenance of mildly damaged shallow wells		2,438,100.00
Water quality tests and analysis using improved methods		119,571,390.00
Construction and relocation of new intake structures (using improved designs)	208,980,000.00	
Construction of new pipelines for upper sections (using G.I pipes).		145,125,000.00
Re-alignment of the pipelines for the upper sections		23,220,000.00
Construction of river crossings (using bridges and/ or under bed crossings)	34,830,000.00	
Reconstruction of water treatment plants (to improve the efficiency of the purification process)		145,125,000.00
Rehabilitation and maintenance of the distribution lines		945,383,501.09
Rehabilitation and maintenance of storage tanks	4,644,000.00	
Construction of new pumping stations and relocation		11,610,000.00
Rehabilitation of damaged pumping stations	5,805,000.00	
Construction of flood control structures on the rivers		8,500,000,000.00
Dyke in Karonga (Rukuru river)		
Dyke in Chikwawa (Ruo and Thangazi)		
Dyke in Nsanje (Shire river)		
Dyke in Zomba rivers		
Preparation of guidelines for flood protection works (for small communities)	100,000,000.00	
Construction of new hydrological stations		24,381,000.00
Rehabilitation and maintenance of damaged stations		1,500,000.00
Rehabilitation of damaged dam sections (construction of embankment and removal of siltation)		26,703,000.00
Sanitation		
Construction of urban sanitation facilities (Sanplat latrines)		1,379,965,000.00
Construction of rural sanitation facilities (Ordinary latrines)		1,655,460,000.00
Construction of urban and rural hygiene facilities		1,308,367,500.00
Construction of rural health and school sanitation facilities (latrines)		32,570,000.00
Emergency		
Emergency water tanks	345,000,000.00	
Water trucking	270,000,000.00	
Disinfectants	11,533,500.00	
Aluminium sulphate	740,940.00	

Activities	Recovery needs	Reconstruction needs
Water Distribution pipes and fittings 920 connections	138,000,000.00	
Relief Sanitation		
Construction of emergency latrines 11500 no.	1,552,500,000.00	
Construction of emergency bathing facilities 11500 no.	517,500,000.00	
Construction of emergency hand washing facilities 11500 no.	258,750,000.00	
Hygiene Promotion		
Distribution of water containers	138,000,000.00	
Provide basic hand washing soap and laundry soap	2,070,000,000.00	
Carry out supervision, monitoring and evaluation of response activities	13,000,000.00	
Conduct hygiene campaigns to promote good hygiene practices among the affected populations	78,000,000.00	
Meeting and coordination(once in a week)	7,800,000.00	
SUB TOTAL	5,755,083,440	20,060,068,341
GRAND TOTAL (MWK)		25,815,151,781

Annex 11: DRM Sector Analysis Tables

Table 36: DRM Sector Effects per district

District/National	Damage		Total
	MWK Million	US\$ Million	
Balaka	1.4	0.00	
Blantyre	22.5	0.05	
Chikhwawa	52.5	0.12	
Chiradzulu	109.5	0.25	
Karonga	39.2	0.09	
Machinga	135.0	0.31	
Mangochi	71.4	0.16	
Mulanje	30.7	0.07	
Nsanje	144.1	0.33	
Ntcheu	4.8	0.01	
Phalombe	2.4	0.01	
Rumphi	2.0	0.00	
Salima	-	-	
Thyolo	7.5	0.02	
Zomba	127.1	0.29	
Total (Million)	750.1	1.7	

Table 37: DRM Sector Recovery Needs

Recovery needs	Cost in Million MWK	Cost in Million US\$
Develop national guidelines for DRM mainstreaming	15	0.03
Facilitate joint planning, implementation and monitoring of DRM programmes at the national level through formalization of the Social Support and DRM SWG and support to the national platform	18	0.04
Support district councils to integrate disaster risk management in the District Development Plans	25	0.06
Support line ministries to integrate disaster risk management in the sectorial plans	10	0.02
Support district councils to develop district disaster risk management plans	11	0.03
Support the establishment and training of civil protection committees in city, municipal and town councils	48	0.11
Revamp, establish and train civil protection committees in districts where they have not been operational	45	0.10
Train national and district level stakeholders on the establishment and management of emergency operations centres	9	0.02
Support simulation exercises at national and local level	17	0.04
Conduct disaster preparedness and awareness through a dedicated radio programme and other public awareness interventions	9	0.02
Support districts with community-based early warning systems	28	0.06
Scale up the community mapping and data preparedness exercises	300	0.69
Support advocacy of building codes and safety measures	5	0.01
Procure radio communication equipment to link the department with all districts	28	0.06
Procure laptops for the department and all Assistant District Disaster Risk Management Officers	5	0.01
Total	572	1.31

Table 38: DRM Sector Reconstruction needs

Reconstruction needs	Cost in Million MWK	Cost in Million US\$
Repair and reconstruct the damaged dykes in all the districts	27	0.62
Restoring the damaged Hydrological stations	25	0.06
Restoring and repairing of the Meteorological stations	30	0.07
Construction of the Evacuation centres in disaster prone districts	150	0.34
Setting up of 1 national, 2 regional and 4 districts EOC's	750	1.72
Total	982	2.26

Table 39: DRM Sector prioritisation of recovery and reconstruction needs

Programme	Short-term	Medium term	Long term
	Up to 12 months	1 -3years	3- 5 years
Facilitate joint planning, implementation and monitoring of ER DRM programmes at the national level through the national DRM platform			
Support district councils to integrate disaster risk management in the District Development Plans			
As flood situation still prevails, damage assessment should be continued to understand the total scenario			
Communication strategy: Communication with media and inter - governmental agencies needs to be improved to increase awareness to general public and to disseminate contingency and recovery policy information on ‘Build Back Better’ campaign for a culture of safety and a resilient Malawi			
Train national and district level stakeholders on the establishment and management of emergency operations centres, and establish, 1 national, 2 regional and 4 district EOC's			
Restoring and upgrade the EWSs, including establishment of institutional structures, linked to the EOCs			
Repair and reconstruct the damaged dykes in all the districts, and include future risks			
Mapping all available resources amongst all stakeholders, government agencies from National and district level, private sector, NGOs and civil society institutions for revamped contingency and evacuation plans to enhance disaster preparedness and response, based on thorough post-mortem of 2015 floods response			
Improved IM: Computerized and efficient logistical systems developed, including the participatory mapping of (human) resources, DRM partners, hazards/vulnerable areas/communities (CC factors included), critical infrastructures, and a central tracking systems or warehouse management system for stock, relief goods and external aid			
Institutional capacity building for longer term DRM planning			

Annex 12: Employment and Livelihoods Sector Analysis Tables

Table 40: Employment and Livelihoods Sector Assessment – Effects on smallholder farmer

Disaster affected districts	<i>Pre disaster</i>	<i>Post disaster</i>	
	# of small holder households	# of small holder households affected	
Balaka	70,765	16,081	
Blantyre rural	79,987	1,565	
Blantyre city	60,366	n/a	
Chikwawa	96,331	14,534	
Chiradzulu	71,963	712	
Karonga	54,399	n/a	
Machinga	112,049	24,126	
Mangochi	182,827	36,958	
Mulanje	125,963	8,392	
Nsanje	48,930	13,514	
Ntcheu	111,685	5,655	
Phalombe	75,764	10,619	
Rumphi	36,773	143	
Salima	75,407	772	
Thyolo	141,159	1,749	
Zomba rural	140,799	11,490	
Total	1,493,371	146,310	

Table 41: Employment and Livelihoods Sector Assessment – Effects on Trade, Industries

Disaster affected districts	<i>Pre disaster</i>	<i>Post disaster</i>	
	# of household enterprises	# of destroyed household enterprises	# of damaged household enterprises
Balaka	16,101	1,466	61
Blantyre rural	31,611	2,172	6,449
Blantyre city	55,187	665	1,995
Chikwawa	17,460	470	287
Chiradzulu	14,626	953	2,668
Karonga	18,679	51	238
Machinga	16,113	45	11
Mangochi	35,909	1,152	1
Mulanje	13,895	424	990
Nsanje	12,388	3,340	14
Ntcheu	26,539	536	134
Phalombe	7,995	1,102	2,572
Rumphi	6,346	0	6
Salima	27,818	24	64
Thyolo	17,964	339	2,239
Zomba rural	29,469	2,236	1,100
Total	359,313	14,974	18,828

Table 42: Employment and Livelihoods Sector income loss in agriculture

Disaster affected districts	# of small holder households affected	Total		Average per affected small holder household	
		MWK million	US\$ million	MWK	US\$
Balaka	16,081	1,882.0	4.2	117,033	263
Blantyre rural	1,565	200.4	0.4	128,043	287
Blantyre city	n/a	n/a	n/a	n/a	n/a
Chikwawa	14,534	3,623.8	8.1	249,327	559
Chiradzulu	712	80.4	0.2	112,985	253
Karonga	n/a	n/a	n/a	n/a	n/a
Machinga	24,126	1,897.8	4.3	78,663	176
Mangochi	36,958	4.9	10.9	131	294
Mulanje	8,392	6,611.2	14.8	787,784	1,767
Nsanje	13,514	3,208.3	7.2	237,409	533
Ntcheu	5,655	854.6	1.9	151,133	339
Phalombe	10,619	1.2	2.7	115	258
Rumphi	143	44.0	0.1	307,529	690
Salima	772	183.3	0.4	237,313	532
Thyolo	1,749	387.7	0.9	221,693	497
Zomba rural	11,490	3,386.0	7.6	294,690	661
Total	146,310	22,365.6	63.8	208,846	508

Table 43: Employment and Livelihoods Sector income loss in trade and industry

Disaster affected districts	# of working days lost	Total	
		MWK million	US\$
Balaka	208,663	186.5	418,382
Blantyre rural	989,701	860.3	1,930,059
Blantyre city	302,463	275.4	617,918
Chikwawa	95,447	85.7	192,288
Chiradzulu	417,033	364.5	817,792
Karonga	32,596	28.9	64,781
Machinga	7,354	6.2	14,011
Mangochi	159,211	134.8	302,421
Mulanje	164,307	143.4	321,747
Nsanje	462,359	423.1	949,338
Ntcheu	88,177	77.2	173,272
Phalombe	427,340	382.9	859,011
Rumphi	670	0.6	1,288
Salima	10,123	8.9	20,040
Thyolo	286,288	254.6	571,262
Zomba rural	426,637	370.6	831,479

Total	4,078,369	3,603.7	8,085,090
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Annex 13: Protection Sector Analysis Tables

Table 44: Average of VSL groups losses due floods

District	# of existing groups	Groups Totally Disrupted	Groups Partially Disrupted	Annual Average Savings per Group MWK*1000	Average Loss for the Totally Disrupted Groups MWK*1000	Average Savings Post Disaster (Down by 70%) MWK*1000	Potential Loss Per group in 6 months MWK*1000
Balaka	415	12	125	340	340	102	170
Blantyre	136	14	41	2,749.00	2,749.00	824	1,374.00
Chikwawa	1236	250	371	1,700.00	1,700.00	510	850
Chiradzulu	189	19	57	1,200.00	1,200.00	360	600
Karonga	250	8	75	2,500.00	2,500.00	750	1,250.00
Machinga	570	16	171	250	250	75	125
Mangochi	190	15	57	350	350	105	175
Mulanje	365	16	110	1,200.00	1,200.00	360	600
Nsanje	283	563	85	800	800	240	400
Ntcheu	187	20	56	1,200.00	1,200.00	360	600
Phalombe	400	30	120	1,200.00	1,200.00	360	6000
Rumphi	256	90	77	850	850	255	425
Salima	193	20	58	500	500	150	250
Thyolo	390	38	117	1,200.00	1,200.00	360	600
Zomba	186	15	56	1,200.00	1,200.00	360	600
Total	5246	1126	1574	17,239.00	17,239.00	5,171.00	8,619.00

Table 45: Protection Sector Effects per District

District	CBCC	VSU	CBO	Damaged and Destroyed Assets	Total in million MWK	Total in thousand US\$
Balaka	31.0	-	-	5.8	36.8	71.3
Blantyre	50.8	-	-	11.1	61.9	116.8
Chikwawa	194.2	2.4	15.9	48.0	260.5	488.5
Chiradzulu	29.8	-	-	6.6	36.4	68.5
Karonga	8.2	8.4	-	3.8	20.4	38.2
Machinga	104.6	-	-	29.0	133.6	240.5
Mangochi	31.3	-	2.3	7.8	41.4	77.0
Mulanje	45.4	2.7	0.8	21.5	70.4	112.4
Nsanje	216.0	15.9	81.8	78.1	391.8	721.1
Ntcheu	149.6	11.4	33.4	51.9	246.3	446.9
Phalombe	63.6	-	4.5	18.9	87.0	256.6
Rumphi	36.5	1.2	-	10.0	47.7	86.7
Salima	0.4	-	-	0.6	1.0	0.9
Thyolo	145.6	6.8	-	35.9	188.3	350.3
Zomba	66.8	2.8	2.8	10.0	82.4	166.4

Total Damage	1,705.8	3,142.1	
Table 46: Protection Sector Recovery Needs			
What to be done (activities)	Short Term (Up to 12 Months)	Medium Term (1 - 3 Years)	Long Term (3 - 5 Years)
Train existing staff in data management			
Establish and strengthen M&E systems	40,000		
Establish protection service provision points			
Recruitment of skilled staff in protection			
Provision of working equipment			
Proper deployment of staff with requisite capacities and qualifications, continuous mapping of protection players, structures, services and information to the districts	300,000	109,111	
strengthen district contingency planning and funding			
District protection stakeholders to hold quarterly meetings to update their plans		28,000	
Undertake Periodic simulation exercises	28,000		
Intensify campaigns on gender equality and women empowerment; Provide credit facilities to women	200,000		300,000
Rebuild and repair the damaged structures; Disseminate and enforce standard design for permanent structures	1,366,847		
Procure furniture and equipment to replace the damaged ones	338,882		
Orient the district and community level structures. Disseminate existing guidelines, code of conduct and standards; strengthen cluster system at the district level; Human Rights investigations and monitoring	75,000		
Institutionalize protection cluster system at district level Strengthening and consolidating inclusion of social processes in PDNAs			
Improve and standardize assessment and reporting templates		5,000	
Support Economic Empowerment Structures with conditional Cash transfers	100,858		
Launch sustained awareness on self-propelled coping mechanisms, dependency and vulnerabilities	40,000	24,000	20,000
Develop standard mainstreaming tools and indicators	5,000		
Orient the sectors on the tools and indicators	20,000	20,000	10,000
Map out protection service providers by service and geographic position			
Develop referral flow chart	15,000		
Orient stakeholders on the flow chart			
Train PSS service providers; Provide support to PSS service providers including CVSUs, One Stop Centres, PVSUs with materials and finances	50,000	100,000	
Total MWK (x K1000)	2,579,587	286,111	330,000

Total US\$ (x\$1000)	5,930	658	759
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Annex 14: Environment sector analysis tables

Table 47: Environmental Sector Effects per district

Districts	Damage in million MWK	Damage in million US\$
Balaka	4.6	0.01
Blantyre	4.2	0.01
Chikwawa	75	0.17
Chiradzulu	266	0.612
Karonga	38.7	0.089
Machinga	455	1.031
Mangochi	249.3	0.576
Mulanje	122.3	0.286
Nsanje	284.3	0.649
Ntcheu	-	-
Phalombe	10.4	0.026
Rumphi	8.5	0.015
Salima	-	-
Thyolo	25	0.06
Zomba	23.8	0.05
TOTAL	1,564.90	3.604

Table 48: Environmental Sector Needs

Environmental Sub sector	Recovery (In Billion MWK)	Construction (In Billion MWK)	Total (In Billion MWK)
Forestry	3	0	3
Land	1		1
Wildlife	0.75		0.75
Water resources		1.5	1.5
TOTAL	4.75	1.5	6.25

Table 49: Environmental sector prioritisation of recovery and reconstruction needs

Challenge	Activities	Estimate d cost (In Billion MWK)	Time frame		
			Short term	Medium term	Long term
Land degradation	<ul style="list-style-type: none"> • Gully reclamation • Filling of barrow pits • Land Resources Conservation. • Promotion of Conservation Agriculture 	1.3			
Deforestation	<ul style="list-style-type: none"> • Afforestation and Reforestation 	1.8			
Loss of biodiversity	<ul style="list-style-type: none"> • Wildlife conservation 	1			
Loss of fresh water supply	<ul style="list-style-type: none"> • Catchment conservation and Promotion of Conservation Agriculture 	1			
Uncoordinated and conflicting sectorial policies	<ul style="list-style-type: none"> • Harmonization of Sectorial policies 	0.1			
Limited knowledge on Community Based Environment and Natural Resources management	<ul style="list-style-type: none"> • Capacity building • Awareness campaign 	0.7			
Un timely implementation of the activities at community, district and national level and misuse of the resources	To ensure that the GoM goals are achieved in mitigating floods and building resilience	0.2			