



GOVERNMENT OF MALAWI



Ministry of Natural Resources

**DEVELOPMENT OF GUIDELINES FOR CLIMATE-RISK BASED LAND USE
PLANNING AND FLOOD ZONING**

FINAL REPORT

Executive Summary

The Government of Malawi, through the Environmental Affairs Department, in the Ministry of Natural Resources and Climate Change has received proceeds of a grant from the Green Climate Fund for a three-year project to build capacity to advance National Adaptation Plan (NAP) process in Malawi. Climate change is likely to further exacerbate flood disasters due to more frequent and severe extreme weather events. Flood zoning is considered as a critical land use tool for managing development in areas at risk of flooding. Development planning authorities can use flood zoning to implement regulations that reduce flood risks in specifically zoned and codified areas.

The primary objective of the consultancy was to develop guidelines for climate-risk based land use planning and flood zoning. The overall approach in the development of the guide included a mixture of methods that included literature review, technical assessments, field investigations, structured observations and case studies. Lilongwe City and Phalombe and Karonga towns were used as case study areas based on the climate risk and flood risk assessments developed by the NAP project. Stakeholder consultations focused on understanding institutional roles, regulatory mandates, and the extent to which climate change, land use and flood zoning considerations have been integrated into development planning and sectoral policies. Stakeholder consultations were complemented by key informant interviews. A range of legislative documents, policies and strategies that guide land use planning and zoning in Malawi were reviewed.

Guidelines for land use planning and flood zoning in Malawi have been prepared. The guide has two major applications, namely informing the land use planning and zoning as well as guiding the preparation and assessment of development proposals and applications for development permissions in flood prone areas. The main aim is to inform land use planning and development in high flood risk areas, to protect the environmental integrity of aquatic resources and to ensure that permitted development enhances the aesthetics and character of the adjacent rivers / wetlands.

This guide has been informed by outputs from three related studies, namely: climate risk assessments, flood risk assessments and a review of policy and regulatory frameworks

(done concurrently with this work). Two case studies of international best practices from South Africa and Australia have been drawn out and applied in coming up with the guide. A synthesis of outputs from related work and findings from the stakeholder engagement, fieldwork and data collection, site assessments and interviews showed a need for risk informed development planning and permitting guidelines, catchment based flood risk management guidelines and guidance on flood zoning, land use planning and assessment of development proposals and application for development permission. The guidelines have set the context for land use planning and flood zoning by presenting the following issues:

- Defining the problem
- Highlighting the need for a guide on land use planning and flood zoning
- Explaining flood behaviour in the context of land use and flood zoning purposes
- Showing the mission, vision and aims for a guide
- Rationale
- Regulatory mandate
- Scope and application
- Strategic objectives
- Pointing out the audience for whom the guide has been written

Part 1 of the guidelines provide the guiding principles on land use planning. The term "guiding" in this context refers to the issues that should inform someone or an entity that is going through the process of coming up with land uses and flood zones. Guidance notes and strategies have been outlined for the following guiding principles.

- Land use planning to have a flood zoning plan in all high flood risk areas
- Flood management and public safety
- Floodline delineation
- Ecological and environmental buffers
- Erosion and sedimentation control
- Socio-economic considerations

A case study of Lilongwe River flood line delineation has given pointers on purpose of flood zones, development standards and procedure for the delineation of flood zones.

Part 2 of the guidelines provide general guiding principles with regards to development restrictions and assessment of proposals by town and city councils have been highlighted. Guiding principles that can help in land use planning at town and local levels with regards to development restrictions and assessment of proposals in flood prone areas have been formulated. The following issues have been highlighted.

- Acceptable development
- Flood zones and acceptable land use
- Development approvals
- Objectives and assessment criteria
- Composition and roles of a planning committee

The guide can be used to formulate plans but also to assess proposed development. The guide will ensure that development in flood-prone areas shall have regard to the City's and district councils' guidance on flood-prone areas.

This guide provides a framework for integrating flood zoning into development planning and sectoral policies at local and national level. The enforcement of decisions in relation to development permission is vested in the Planning Committee which has a duty to provide enforcement mechanisms and measures. An Operational Framework which acts as a practical blueprint/tool for applying the 'guidelines for climate-risk based land use planning and flood zoning' by City/District Councils and planning authorities has been provided as a separate appendix.

It is recommended that local and national development plans should satisfy the stipulated conditions and requirements in this guide in order to reduce vulnerabilities to flooding.

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Abbreviations and Acronyms

CSOs	Civil Society Organisations
CRA	Climate Risk Assessment
CAB	Congo Air Boundary
CIRA	Construction Industry Regulatory Authority
DCCMS	Department of Climate Change and Meteorological Services
DoDMA	Department of Disaster Management Affairs
DESC	District Environmental Sub-Committees
ENSO	El Niño Southern Oscillation
ESIA	Environmental and Social Impact Assessments
GOM	Government of Malawi
ITCZ	Inter-tropical convergence zone
MEPA	Malawi Environmental Protection Authority
MGDS	Malawi Growth and Development Strategies
MDA	Ministries, departments and agencies
NAP	National Adaptation Plan
NEP	National Environment Policy
NPDP	National Physical Development Plans
NRS	National Resilience Strategy
NWRA	National Water Resources Authority
NDC	Nationally Determined Contributions
RID	Risk Informed Development
SEA	Strategic Environmental Assessments
RCRP	Regional Climate Resilience Programme
TWI	Topographic Wetness Index
UNDRR	United Nations Office for Disaster Risk Reduction

Key Definitions

“building” means any building, erection or structure erected on or made on, in or under any land and includes the land on, in or under which the building, erection or structure is situated;

“development” means any man-made change to property, including but not limited to construction or upgrading of buildings or other structures, filling, paving, municipal services, or the associated preparation of land; or development in relation to any land means any building, rebuilding, engineering or mining operations

in, on, under or over land and any material change in the use of land or building;

“ecological buffer” means a strip of land adjacent to a river or wetland required for the protection and enhancement of these ecosystems;

‘flood’ means a general and temporary condition of partial or complete inundation of land from the overflow of a body of water;

‘flood hazard’ means a dangerous phenomenon or condition as a result of a flood that may cause loss of life, injury or other health impacts, property damage, loss of livelihoods and services, social and economic disruption, or environmental damage.

“floodlines” mean lines on a map or drawing depicting water levels likely to be reached by a flood having a specified recurrence interval;

‘floodplain’ means area susceptible to inundation by the 100-year flood;

‘flood-prone area’ means any land area susceptible to being inundated by water from any source;

‘guide/guidelines’ means a document containing guiding principles in the form of brief statements, prescriptions, guidance notes and strategies that describe specific requirements to be met, achieved and maintained in land use planning and flood zoning.

“planning area” means an area declared as such under Part IV of the Town and Country Planning Act of 2016

“recurrence interval” means the average interval between rainfall or flood events equaling or exceeding a specified severity;

“river corridor” means a mixed-use corridor comprising a river and/or associated wetlands, the floodplain, the ecological buffer and the area required for specific aesthetic, recreational and/or socio-economic needs. This combined area must be managed in an integrated manner which balances the flooding, environmental, social and economic issues;

"structure" means any man-made feature affixed to the ground or attached to something located on the ground, including but not limited to fences, walls, berms, levees, fill, storage tanks, shelters or buildings;

"river" means a river, stream, channel, canal, wetland, dam or lake in or into which water flows regularly or intermittently. Reference to a river includes, where relevant, its bed and banks;

"wetland" means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil. This definition thus includes, but is not necessarily limited to, water bodies such as lakes, marshes, coastal lakes, estuaries, marshes, swamps, pools, ponds, pans and artificial impoundments.

"wetland delineation" means the determination and marking of the boundary of a wetland using nationally accepted guidelines / methodologies.

'zone' when used as a verb in relation to land, means to designate land for a particular zoning;

'zoning' includes base zoning and overlay zoning and means a land use category prescribed by the development management scheme regulating the use of and development of land and setting out;

- a) the purposes for which land may be used; and
- b) the development rules applicable to that land use category;

1 BACKGROUND

1.1 Project Context

Malawi faces a number of climate induced disasters including floods, droughts, strong winds, hailstorms and landslides. The intensity and frequency of such disasters has been increasing thereby affecting town and city infrastructure. Increasing occurrence of disasters increases the vulnerability of households and communities. It is imperative that development must be done responsibly to ensure that it does not adversely impact on present and future communities, natural ecosystems and the national economy particularly in the context of climate change.

The Government of Malawi, through the Environmental Affairs Department, Ministry of Natural Resources and Climate Change has received proceeds of a grant from the Green Climate Fund for a three-year project to build capacity to advance National Adaptation Plan (NAP) process in Malawi. The main project is titled: "Advancing the NAP process: Climate resilience for sustainable development in Malawi". The project is supporting multi-sectoral, medium- to long-term adaptation planning and budgeting in Malawi and promoting the integration of climate change adaptation aspects into development planning processes and policies. Some of the project's work included climate and flood risk assessment.

1.2 Problem Statement

According to a standard set of classifications of hazards by United Nations Office for Disaster Risk Reduction (UNDRR, 2020), meteorological and hydrological hazards are those resulting from the state and behaviour of the Earth's atmosphere, its interaction with the land and oceans, the weather and climate it produces, and the resulting distribution of water resources. According to Emergency Management Disasters Database, from 1979 to 2019, 50% of all recorded disasters (including technological and 'complex' disasters), 56% of deaths and 75% of economic losses are attributed to weather, climate and water-related hazards. Some of the most devastating weather, climate and water-related hazards in Malawi include cyclones, stormy rains and floods.

Tropical cyclones and higher intensity stormy rains have a history of causing serious devastation in Malawi. Cyclone Idai in 2019 caused severe floods in 13 districts and

affected approximately 975,600 people. Tropical Storm Ana in 2022 caused flooding and stormy rains that affected 994,967 people. In February 2023, Cyclone Freddy, the worst ever tropical cyclone to affect Malawi, killed more than 700 people with 500 still listed as missing. Extreme rainfall also contributed to soil saturation and the associated shear strength reduction associated with landslides and mudflows. Over the past five decades, Malawi has experienced at least 19 major floods. These events keep on increasing in frequency and magnitude. Most of the devastating floods have been caused by tropical cyclones and stormy rains. Over 500,000 people have been displaced by flooding. Flooding has also caused extensive infrastructure damage.

The results of the flood risk assessment and vulnerability assessment showed that flooding is having a huge impact on community livelihoods. It was observed that towns and cities are being posed with high flood risk despite having large informal settlements, many of which are located within poorly drained or flood prone areas. This specific consultancy work is aimed at determining how best how to incorporate land use planning and zoning with a goal of reducing climate change impacts and protect people and physical assets from flooding. As a preamble, a review of policies on land use and zoning was initiated. Based on the findings of the flood risk assessment, it was decided that a guide should be developed that will ensure that climate change is codified in land use planning and flood zoning in Malawi. This guide is expected to inform the planning of disaster risk reduction and climate change adaptation in Malawi within the objectives of the NAPs.

The objectives of the NAPs are to:

- 1) Reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; and
- 2) Facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programs and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels.

1.3 Climate Change Adaptation and Flood Risk Management

Communities will have to adapt to riverine floods, flash floods and urban floods. One way to ensure responsible infrastructure development is to ensure land use zoning.

'Zoning' means a land use category that is prescribed by the development management scheme that regulates the use of and development of land by setting out the purposes for which land may be used; and the development rules that should be applicable to that land use category. This is achieved using flood zoning codes or codification. The codification of climate change into land use planning and flood zoning is intended to ensure that city and town infrastructure will not be adversely affected by climate change. In readiness for NAP implementation, there is a need for the codification of climate change into land use planning and flood zoning as well as to develop land use planning and flood zoning guidance that incorporates climate change risks for Lilongwe City and based on the climate risk and flood risk assessments developed by the NAP project (ARIA and ACTERRA, 2024).

There is complementary work that has reviewed regulatory instruments and institutions that govern land use planning and zoning in Malawi. The work has appraised land use planning approaches and practices in Malawi. It has analysed the effectiveness and enforcement of regulatory frameworks in the context of climate change and made recommendations on how targeted policy and regulatory frameworks can help in dealing with flood risks. The policy and regulatory frameworks' assessment included community and local policies and regulations or byelaws. The nonexistence of a method to prioritise land use planning in the areas declared as high flood risk or most devastated by previous flooding is a huge challenge. In Cities such as Cape Town, it is mandatory that all land within the geographic area of the City must have a zoning scheme. The purposes of the development management scheme include:

- regulation of use rights and control of the use of land;
- facilitation of the implementation of policies and principles set out in relevant spatial development frameworks and binding policies and principles set out in and in terms of national and provincial legislation;
- facilitation of efficient, economic and sustainable use of land;
- protection of areas with an environment which could be substantially adversely affected by development

By implementing land use planning and flood zoning, climate change challenges can be addressed through a range of measures that can increase adaptation efforts by limiting and prescribing appropriate development in floodplains and river corridors.

1.4 The Objective of the Consultancy

The primary objective of the consultancy was to develop a guide that will ensure that climate change is codified in land use planning and flood zoning in Malawi.

The specific objectives included:

1. To facilitate the scoping for the codification of climate change into land use planning and flood zoning in Lilongwe City and two selected districts of Karonga and Phalombe.
2. To develop climate codified land use planning and flood zoning guide for Malawi with Lilongwe City and Phalombe and Karonga districts as case studies.

2 METHODOLOGY

2.1 Overall Approach

The overall approach in the development of the guide included a mixture of methods that included literature review, technical assessments, field investigations, structured observations and case studies. The key consideration during the technical assessment was to gain an independent view of the role of land use planning and zoning in infrastructure development in towns and cities in Malawi. Ultimately, the aim was to draw potential key lessons and best practices from literature, technical and field data, and case studies for enhancing flood resilience through coded land use and flood zoning.

According to the United Nations Office for Disaster Risk Reduction (UNDRR, 2023), to make infrastructure systems capable of withstanding disruptions from a wide range of hazards, countries need to establish effective legal and policy frameworks and strengthen institutional arrangements. This is the reason why a review of policy and regulatory frameworks on land use and zoning was undertaken under a different assignment. However, the results from the policy and regulatory frameworks' review assignment have been integrated and applied in this assignment.

2.2 Specific Methodology

The specific methodology comprised of the following steps:

Step 1: *Inception Meeting and Reporting*

An inception meeting was convened between the client, their stakeholders and all consultants at the Environmental Affairs Department in Lilongwe. During the inception meeting, the consultants presented their understanding of the assignment and the corresponding proposed approach to the development of the guide. The Terms of Reference were thoroughly reviewed and agreed upon by both parties. An inception report was submitted and approved.

Step 2: *Review of existing policies and regulations.*

Policy and regulatory frameworks directly impact the resiliency of infrastructure assets and the continuity of associated services. Cross-cutting policies and inter-sectoral

regulatory mechanisms are also necessary since disasters often have cascading effects that impact multiple sectors. Similarly, it is crucial to assess whether sectoral policies and strategies properly capture responsible approaches to flood risk management. The consultant conducted a comprehensive review of the regulatory and institutional framework governing land use planning and zoning in Malawi. This process involved an extensive desktop analysis of key national policies, laws, and planning instruments as well as a review of international best practices.

Step 3: *Mapping, identification and engagement of key stakeholders and governance institutions.*

This involved mapping of the key stakeholders that are involved in land use planning for infrastructure development in towns and cities. These included ministries, departments and agencies (MDAs), non-state actors, regulators and communities themselves. This task involved the engagement of key stakeholders at national, City and district levels to inform the formulation of the guide and adaptation initiatives. The governance institutions were probed to understand their roles in implementation of the guide.

Step 4: *Development of a land use planning and flood zoning guide.*

This step involved the development of land use planning and flood zoning guide that incorporated the climate change risks for Lilongwe City and the climate risk and flood risk assessments developed by the NAP project in Phalombe and Karonga districts. The goal of this step was to develop a climate-codified land use planning and zoning guide. The aim of the guide is to ensure that development in flood-prone areas shall conform to specified requirements.

Step 5: *Validation of the land use planning and flood zoning guide.*

This step involved the validation of the Guidelines. The draft final document was sent to key stakeholders for their review and input. The stakeholders were then invited to a validation workshop that took place on 23 July 2026 at Bingu International Conference Centre. The signed attendance sheet for the stakeholders that attended the validation meeting is attached in Appendix 1.

2.3 Identification and Engagement of Key Stakeholders

Institutional governance has a critical role in achieving climate resilience. Implementation of land use planning and flood zoning requires a comprehensive consideration of all steps towards flood vulnerability assessment. Vulnerability is influenced by a range of factors including socioeconomic conditions, governance, and physical infrastructure (UNISDR, 2015). Strong governance system is key for the enforcement of the implementation of climate and disaster resilient infrastructure. Land use planning and flood zoning guide required the input, collaboration, and support of several key stakeholders and institutions. It was noted that there is a broad range of stakeholders that play specific roles in activities related to land use planning and zoning at both national to community levels.

Various stakeholders were involved through consultations, face-to-face meetings and workshops and virtual meetings. The key stakeholders were categorized as follows:

a. Government ministries, departments and agencies

Government ministries, departments and agencies (MDAs) at local and national level are policy holders and initiate changes to national policy for land use planning. MDAs provide inter-sectoral coordination. Government ministries, departments and public agencies have legal or legislative authority to enforce regulatory and policy frameworks.

b. Regulators

Regulators ensure adherence to codes and standards. Regulators require infrastructure developers and operators to adhere to specified development requirements prior to development and during implementation and operation.

c. Land developers, owners and users

Land developers and users are responsible for development, usage, renewal/restoration and maintenance/upgrade of infrastructure. Owners and developers are required to assess potential climatic hazards.

d. Non-state actors

Non-state actors included civil society organisations, academia, private sector, non-governmental organisations, individuals and well-wishers that have an interest in land use planning.

e. Contractors and consultants

Contractors are responsible for construction and maintenance of infrastructure. Consultants are responsible for designing and construction supervision of infrastructure.

All the above stakeholders have a responsibility (in whole or in part) for overseeing the activities related to land use planning and development. Table 2.3-1 shows stakeholders and their roles. Appendix 1 shows the stakeholders that were consulted.

Table 2.3-1 Stakeholders and their roles.

	Stakeholder	Stakeholder's Role
Category 1 Government Ministries, Departments Agencies and Regulators	Ministry of Lands, Housing & Urban Development	- Responsible for preparing National Physical Development Plans (NPDP) and guiding district and local plans. - Sets standards for land classification and zoning, including urban expansion and rural land management. - Provides policy direction for integrating environmental safeguards and disaster risk reduction into planning
	Department of Physical Planning	Develops district and local physical development plans.

		• Advises councils on zoning regulations and land use schemes. • Ensures compliance with planning standards during development approvals
	District councils and local government	• Approval of site design and monitoring construction • Approval of development plans • Implement land use plans and enforce development control at the local level. • Issue development permits and enforce zoning by-laws. • Prepare district and local plans aligned with national frameworks. • Engage communities in planning processes and enforce local by-laws for flood risk reduction.
	Department of Disaster Management Affairs	• Relocation of people living in very high-risk areas • Promote disaster preparedness through measures, including, the development of multi-hazard contingency plans,

		maintenance of disaster risk management information systems and integrated multi-hazard early warning systems • Provides hazard and risk data for planning processes. • Advises on zoning restrictions in high-risk areas and supports relocation initiatives. • Oversees community-based disaster risk reduction programs.
	Department of Climate Change and Meteorological Services	• To monitor, analyse and predict weather and climate. The thrust of this objective is to ensure that the weather forecast is produced for early warning purposes. This information is vital for advisory in natural disaster early warnings. • To provide weather and climate data and information for various socio-economic sectors such as Aviation, Agriculture, Water, Marine, Construction industry,

		insurance, Tourism, Health, sports and Recreation. • To carry out research and development that would improve quality of weather and climate data and information for the general public. The focus is to carry out research for all aspects of meteorology, inter alia, the general public through mass media. • To establish and maintain a well-equipped network of Met stations. This Objective intends to ensure that meteorological data and information is reliable, timely and up to date.
	Department of Water Resources	• To prepare flood control and management plans; • To provide policy direction and strategy development for water resources and protection of water resources; • To develop regulations, legislation, and other measures to ensure sustainable management of water; • To research potential water resources including

		groundwater and surface water; • To develop plans for water development and protection of water resources; • To regulate and control the use of water resources; • To collect and record information on hydrology, and to use this information to serve national and international needs
	Construction Industry Regulatory Authority (CIRA)	• Regulate, develop and promote the Construction Industry in Malawi. • Registration of consultants and contractors • Regulating the contractors and consultants
	Malawi Environmental Protection Authority (MEPA)	• Regulates environmental protection and compliance, including Environmental and Social Impact Assessments (ESIA) and Strategic Environmental Assessments (SEA). • Reviews development projects for environmental compliance, including flood risk considerations.

		• Provides statutory hooks for integrating climate risk into ESIA/SEA processes. • Coordinates with planning authorities to ensure environmental safeguards in land use decisions. • Coordinates with institutions such as the Construction Industry Regulatory Authority (CIRA), Malawi Engineering Institution, NWRA, sector ministries, and local authorities through inter-agency consultations, joint inspections, technical review committees, and statutory referral processes during project appraisal and approval.
	National Water Resources Authority (NWRA)	• Regulates water resources, catchment management, and flood control under the Water Resources Act (2013). • Provides hydrological data and flood risk assessments for planning. • Oversees dam safety and river basin management, which influence settlement patterns.

		• Advises on zoning restrictions in floodplains and riparian areas.
	Malawi Engineering Institution	• Regulating the professionals/engineers
Category 2 Non State Actors,	Civil Society Organisations (CSOs)	• Oversight and education awareness
	Academia/Universities	• Contributing towards policy • Research and consultancy

Category 3 Consultants	Consultants (Engineers, Architects, Quantity Surveyors, Land Surveyors, Planners and Economists)	• Planning, design and construction supervision • Ensure that infrastructure is constructed in accordance with guidelines, plans and specifications
Category 4 Contractors	Contractors (Building, Civil, Services, Landscaping and Specialists)	• Ensure that construction of infrastructure is in accordance with plans and specifications

2.4 Fieldwork and Data Collection

This stage involved collecting stakeholder and community-generated data. Comprehensive field assessments were conducted through site visits to the designated study areas of Lilongwe City, Karonga District, and Phalombe District. These visits involved transect walks of flood-prone areas, observation of settlement patterns, and verification of existing land use and zoning practices against statutory requirements. Second, the consultant carried out structured interviews with key stakeholders, including

officials from local councils, planning departments, and community representatives. These interviews were designed to capture qualitative insights on regulatory enforcement, institutional capacity, and community-level practices, particularly in informal settlements.

2.5 Site Assessments

This stage involved site assessments through transect walks, stakeholder engagements and consultation meetings. The consultant visited the designated sites and conducted systematic walkthroughs in areas historically affected by flooding to gather firsthand observations and validate existing risk data. During these field assessments, the consultant examined settlement patterns, drainage infrastructure, and proximity to hazard zones, correlating these observations with documented flood events. Existing flood maps provided by the client were utilized to verify the accuracy of mapped inundation zones, and the consultant cross-checked these overlays against local knowledge obtained through community interactions. This process included delineating the physical extent of past flooding to confirm the boundaries of high-risk areas and assess the reliability of historical flood data.

By integrating geospatial analysis of remote sensed data, the consultant was able to determine land use changes and historical perspectives.

2.5 Interviews

At the national level, the consultant engaged in structured discussions with key institutions, including the Malawi Housing Corporation, Construction Industry Regulatory Authority (CIRA), Department of Disaster Management Affairs (DoDMA), Department of Physical Planning, Department of Climate Change and Meteorological Services (DCCMS), the Environmental Affairs Department, and the Departments of Planning and Economic Development within Lilongwe City Council. These consultations focused on understanding institutional roles, regulatory mandates, and the extent to which climate change considerations were integrated into land use planning and flood zoning policies. At the district level, the consultant held meetings with members of the District Environmental Sub-Committees (DESCs) in Karonga and Phalombe, facilitating dialogue on local enforcement practices, capacity gaps, and community-level challenges.

To complement these engagements, the consultant administered key informant interviews to capture qualitative and quantitative insights on land use and flood zoning. The targeted key informants were physical/urban planners, engineers, hydrologists, disaster risk managers, environmental officers, planning authorities, traditional leaders, members of the Board of Architects and Quantity Surveyors, Surveyors Institute of Malawi, Malawi Engineering Institution. The questionnaires explored issues such as how flood risk management considerations have been incorporated into land use planning and zoning, awareness of flood risk zoning, and the level of technical knowledge among participants.

2.6 Approach for Developing the Guide

The guide was developed based on the lessons from international best practices, case studies and findings from stakeholder consultations.

2.5 Validation

The guidelines were validated through a workshop that was attended by all key stakeholders. The report was shared prior to the workshop.

3 A SYNTHESIS OF OUTPUTS FROM RELATED WORK

This guide has been informed by outputs from three related studies. These are:

- i. Climate risk assessments
- ii. Flood risk assessments
- iii. Review of policy and regulatory frameworks (done concurrently with this work)

3.1 Climate Risk Assessments

Climate Risk Assessments identify the likelihood (frequency and intensity) of climate hazards and their potential impacts for specified geographic entities, in this case a country and its districts. This is a fundamental step in informing and assessing the need for climate action and investment and strategising climate adaptation and building of resilience. ARIA (2025) compiled a government-validated climate risk assessment (CRA) for the predominant climate hazards affecting Malawi (storm, flood, heat and drought), both nationally and at selected district level.

According to ARIA (2025), Malawi has a sub-tropical continental climate characterised by two distinct seasons: a rainy season from November to April and a dry season from May to October. Average daily temperatures vary with seasons and elevation, with the coldest temperatures (6-10°C) in July in the Mulanje Highlands and the hottest (35–36°C) in October in the Lower Shire Valley. Maximum temperatures in the Lower Shire Valley have been breaking records in recent years, often exceeding 40 and reaching as high as 46°C. Annual precipitation can vary from as little as ≤600mm per annum along the Rift Valley floor (shore of Lake Malawi) and the Lower Shire Valley to ≥2500mm (World Bank 2021), and more in some highland areas over 1300 m (see Figure 1). Overall, rainfall exhibits considerable interannual variability and is highly influenced by the inter-tropical convergence zone (ITCZ) together with the Congo Air Boundary (CAB), El Niño Southern Oscillation (ENSO) including the La Nina phenomenon and Indian Ocean Dipole (IOD), the southern Indian Ocean Mascarene High, variability in the water levels in the country's major lake – Lake Malawi, and the broader hydrological network (GoM 2019).

The predicted mean rainfall for Malawi for the present and future is presented in Figures 3.2-1. DCCMS reports that the future rainfall changes are uncertain, as 67% of the models indicate a decreasing trend of rainfall from 2040s to 2080s for SSP2.45 scenario,

while with the SSP5.85 scenario, more models (67%) indicate a decreasing trend during the 2040s, but the dimensions change during 2060s and 2080s where more models (67%) indicate an increasing trend. The ensemble mean of the models cancel each other out hence not much change is noted in Figure 3.2-2 among the 2020s, 2040s, 2060s and 2080s for both scenarios.

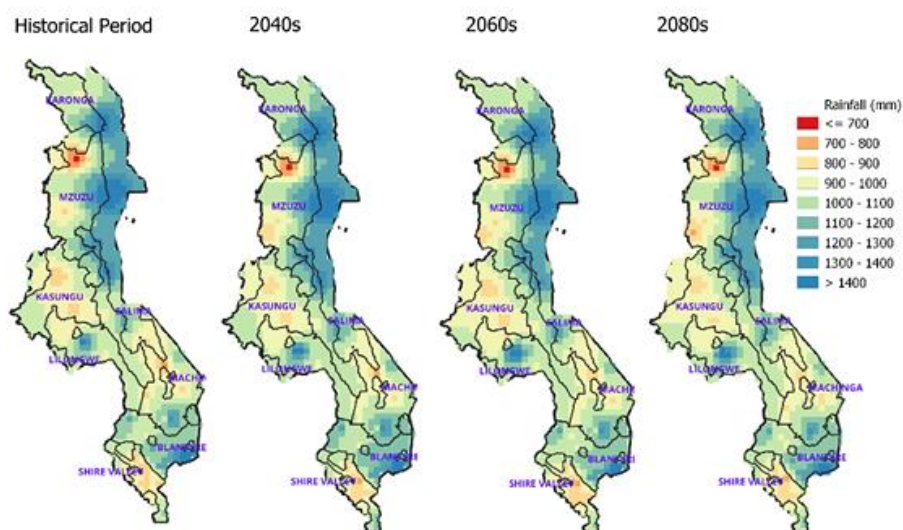


Figure 3.2-1. The ensemble annual rainfall mean from 2020s (historical period) to 2040s, 2060s and 2080s based on a better case scenario – SSP2.45. The eight ADDs are overlain on the distribution (DCCMS, 2023).

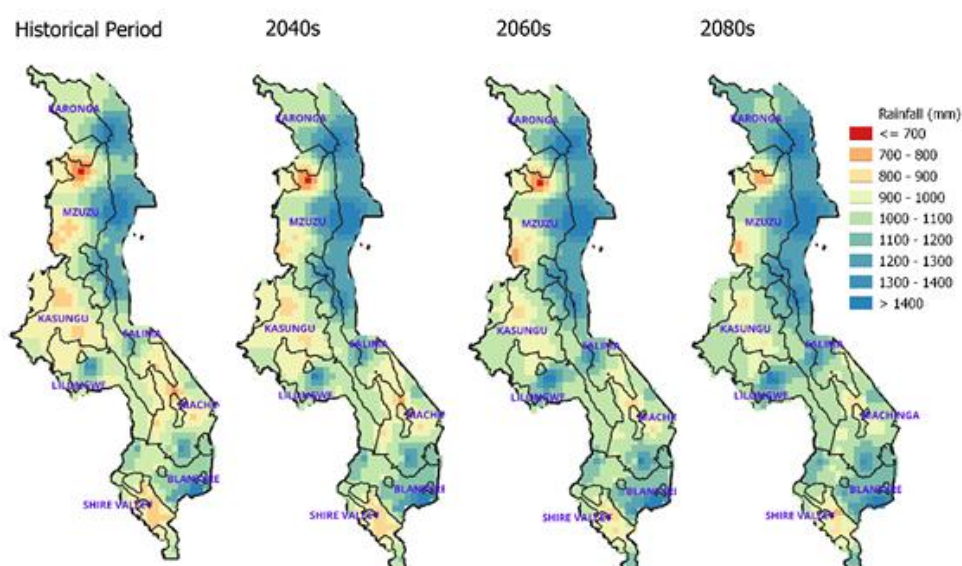


Figure 3.2-2. The ensemble annual rainfall mean from 2020s (historical period) to 2040s, 2060s and 2080s based on a better case scenario – SSP5.85. The eight ADDs are overlain on the distribution (DCCMS 2023)

3.2 Flood Risk Assessments

Flood risk at national scale was assessed (ARIA, 2023) using both the Topographic Wetness Index (TWI) and the average annual rainfall. Incorporating multiple variables was necessary to develop a more comprehensive understanding of flood risk in Malawi. TWI provides information about the relative moisture availability in a given area based on local topography, while the average annual rainfall provides information about the overall amount of precipitation that an area receives. By combining these two variables, it was possible to identify areas that are more susceptible to flooding due to a combination of high rainfall and a high potential for surface runoff or infiltration.

The formula for calculating TWI, as defined by Beven and Kirkby (1979)¹, is

$$TWI = \ln\left(\frac{a}{\tan(b)}\right)$$

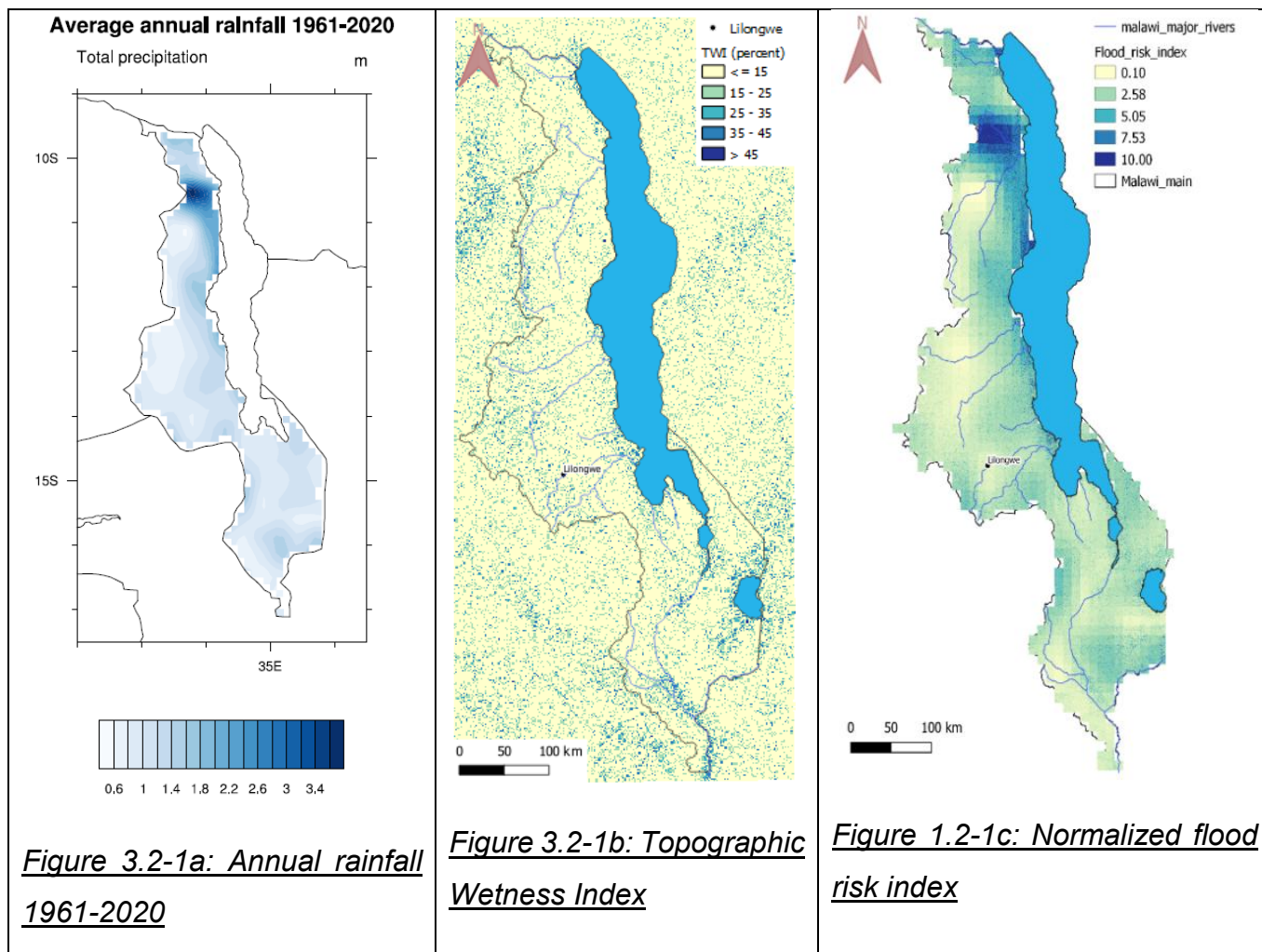
where :

- **a** is the local upslope area draining through a given pixel and
- ***tan(b)*** is the local slope in radians.

The formula combines information on slope, aspect, and elevation. The upslope contributing area (*a*) is a measure of the area upstream of a given point that contributes flow to that point. The slope angle (*b*) is used to estimate the water-holding capacity of the soil and the potential for runoff. ***TWI*** is a dimensionless index that ranges from 0 to 1, with higher values indicating areas with greater moisture availability. Figure 3.2-1 (a,b,c) shows average annual rainfall, Topographic Wetness Index and Normalized flood risk index.

The application of the flood hazard index to critical basins in Malawi manifests 4 risk zones: i) low, moderate, elevated and high. On the flood risk index map, it was possible to plot the main cities and note those with a high risk. The area in dark blue at the top of the map is a high flood risk combining high precipitation and high ground. Lakeshore areas are also highly susceptible.

¹ Beven, K. J., and Kirkby, M. J. (1979). A physically based, variable contributing area model of basin hydrology. *Hydrological Science Bulletin*, 24 (1): 43–69. doi:10.1080/02626667909491834.



3.3 Review of Policy Frameworks

A range of legislation, policies and strategies guide land use planning and zoning in Malawi.

3.3.1 The Malawi Vision 2063

The Malawi vision 2063 sets national goals that will facilitate the realization of the aspirations of the people of Malawi. The Malawi 2063 is aligned to the Sustainable Development Goals whose overall objective is to create a better and sustainable future for all. The Malawi Vision 2063 has three pillars which include Agricultural Productivity and Commercialization, Industrialization and Urbanization. Land use planning and zoning is critical in urbanization.

3.3.2 National Environmental Policy, 2004

The 2004 National Environment Policy is a key instrument that provides benchmarks for environment and natural resources policies and legislation in the country. The policy provides a framework for addressing environmental challenges and the promotion of sustainable social and economic development through sound management of the environment and natural resources. The NEP (2004) articulates institutional arrangements, roles and responsibilities for environmental management at national, regional and local levels. The Policy promotes sustainable social and economic development through the sound management of the environment and natural resources in the country. Land use planning and zoning is key to sustainable development. Section 5.1.4. says 'prevent or minimize the environmental impact of cultivation and other development on marginal lands (steep slopes, 'dambos', swamps and areas susceptible to flooding) through improved cultivation of agricultural production'. Section 5.1.5 says 'ensure observance of buffer zones along rivers such as rivers, streams, lakes or dambos so as to prevent siltation, scouring and pollution of water bodies'.

3.3.3 National Land Policy, 2002

The policy provides an institutional framework for democratizing land management and outlines procedures for protecting land tenure rights, land-based investments, and management of development at all levels. The policy provides guidance on zoning on specific land management mechanisms.

3.3.4 National Climate Change Management Policy, 2016

The policy provides strategic direction for Malawi's priorities for climate change interventions and outlines an institutional framework for the application and implementation of adaptation, mitigation, technology transfer and capacity building measures.

3.3.5 National Water Resources Policy, 2005

The overall goal of the policy is sustainable management and utilization of water resources, in order to provide water of acceptable quality and of sufficient quantities, and ensure availability of efficient and effective water and sanitation services that satisfy the basic requirements of every Malawian and for the enhancement of the country's

natural ecosystems. The policy provides a strategic framework for the sustainable management of water resources in the country. Apart from articulating the roles and responsibilities of various institutions towards water resources management, the policy comprehensively covers areas of water resource management and development, water quality and pollution control as well as water utilization. Land use planning and zoning has a bearing on pollution control and water resources management.

3.3.6 The National Resilience Strategy, 2018-2030

This National Resilience Strategy (NRS) of Malawi is a cross-sectoral document aiming at creating a country (i) resilient to economic and environmental shocks; (ii) able to sustain inclusive growth, food and nutrition security; (iii) able to achieve an improved well-being for all Malawians; and (iv) transitioned from recurrent humanitarian appeals to protective and productive investments in complementary interventions targeting food insecure and poor households. The National Resilience strategy aims to break the cycle of humanitarian assistance and has the following pillars; Resilient agriculture growth; Risk Reduction, Flood Control and Early Warning and Response Systems; human Capacity, livelihoods and social protection and Catchment protection and Management. It is a long-term plan up to 2030 and it's in line with Sustainable Development Goals.

Through the Plan, government brings a multi-dimensional approach to control floods, reduce food insecurity and grow exports, protect and manage the environment and catchments, enhance early warning system and provide social support interventions using a single monitoring and evaluation framework, enhanced coordination, pooling of resources and prioritization. Resilience of livelihoods to disasters is expected to be increased by (i) integration of climate science and natural resource management into planning for other sectors; (ii) expansion of data collection and analysis on risk information to guide development planning, as well as improvement of community access to risk information that affects their lives.

In terms of Governance, the NRS calls for (i) integration across government technical sectors, coordination through geographic targeting to ensure the same beneficiaries benefit from the range of services promoted; (ii) increased coordination among development partners and NGOs; and (iii) a significant role in the management of multi-sectoral programs, monitoring and evaluation, learning, information systems, and knowledge management.

3.3.7 Nationally Determined Contributions, 2021

These contributions include commitments to climate adaptation through sustainable education systems, enhanced access to digital tools, and community-based participation in education recovery. The NDCs under adaptation prioritised agriculture (crops, livestock, fisheries), water resources, health, infrastructure, land use planning, transport, population and human settlements, disaster risk management, forestry; wildlife, energy and gender. The key sectors under mitigation include; energy, industrial processes and product use (IPPU), agriculture, forestry and other land use (AFOLU), and waste. The updated NDC builds upon the NCCMP in its commitment to tackling climate change through the development of both mitigation and adaption responses, as well as other key national guiding documents including Malawi 2063, the Malawi Economic Growth Strategy (MEGS), and the Malawi Growth and Development Strategies (MGDS) III. The NDC also aligns with Malawi's National Adaptation Plan (NAP) Framework, which the country developed in 2020 to guide efforts to develop its National Adaptation Plan with an effort to address climate change.

These sectors are based on national priorities and there is emphasis on multi-sectoral collaboration in implementation, capacity building, research, and consideration for disaster risk management as well as the need to harmonise policies. NDCs promote and enhance climate change education, public awareness and capacity building through ongoing communication, training, information and knowledge management.

3.3.8 National Adaptation Plan (NAP)

The NAP highlights the need for climate-resilient education that leverages technology and innovative learning methods to ensure learning continuity during extreme weather. The National Adaptation Plans (NAPs) are still under development. The NAP Framework is being built on the NAP Roadmap by validating and updating the vision, objectives and mandates for adaptation structures in Malawi. A NAP stock taking report was completed with support from UNDP. Sectors reviewed for consideration included Agriculture, Water, Energy, Fisheries, land Use Change and Forestry, Wild Life and Biodiversity, Human health and cross cutting issues including gender and education

3.3.9 National Disaster Risk Management Policy, 2015

This policy emphasizes the preparedness of educational systems, with a focus on community-driven disaster risk management and climate-adapted learning models. The development of the National Disaster Risk Management (NDRM) Policy is a major step towards achieving sustainable development through ensuring that disaster risk management is integrated in development planning by all sectors in the country. The policy will also facilitate the effective coordination of disaster risk management programmes in the country. 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 organisations, private sector organizations, media and development partners at national and local levels on how to effectively implement disaster risk management programmes and activities.

3.3.10 National Urban Policy, 2019

The National Urban Policy (2019) promotes integrated and inclusive urban development.

3.3.11 Physical Planning Act, 2016

The Physical Planning Act (2016) offers opportunities for incorporating climate resilience into land use regulations including consideration of informal settlements, vulnerable areas, and local capacities.

3.4 Review of Legal Frameworks

3.4.1 Republic of Malawi (Constitution) Act, NO. 20 of 1994

The constitution is the supreme law of the country. Section 13 (d) of the Constitution provides a broad framework for sustainable environmental management at various levels in Malawi. Among other issues, it calls for prudent management of the environment and accords future generations their full rights to the environment. The Constitution provides the fundamental principles that require the State to promote the welfare and development of the people by progressively adopting and implementing policies and legislation aimed at achieving gender equality, adequate nutrition, adequate health care and responsible management of the environment.

3.4.2 Environment Management Act, No. 19 of 2017

The EMA is the principles legislation for the protection and management of the environment conservation and sustainable utilization of natural resources in the country. The Act establishes the Malawi Environment Protection Authority as the responsible authority for the protection and management of the environment in Malawi. The EMA states that that every person will take all appropriate measures to protect the environment, conserve natural resources, and promote the sustainable utilization of natural resources. Precautionary measures must be taken to prevent or mitigate possible detrimental environmental effects.

3.4.3 Water Resources Act, No. 2 of 2013

The Act provides for the management, conservation, use and control of water resources, for the acquisition and regulation of rights to use water. The Act is Section 4 promotes the rational management and use of the water resources of Malawi, allow for orderly development and use of water resources for all purposes, control pollution and promote the safe storage, treatment, discharge and disposal of waste and effluent which may pollute water, harm the environment and human health. Land use planning and zoning contributes to orderly development of water resources. Section 118 of the Act says that the National Water Resources Authority shall cooperate with Local Authorities in determining the geographic extent of floodplain areas and assist such Authorities in regulating the development and use of lands within such areas.

The National Water Resources Act 2013 provides the following measures for flood mitigation and control:

Section 118 says for the purpose of preventing or minimizing the risk of flooding and flood damage, the Authority may do any of the following:

- (a) prohibit the construction on submersible lands or dikes, levees or other structures likely to hinder the run-off of flood water; provided that authorization may be granted for the development of such structures if they are determined to be necessary for the protection of already existing residences or other private structures;
- (b) alter or demolish dikes, embankments, levees, structures or other works, irrespective of their legal status, if they are determined by the Authority to hinder water run-off or to extend the flood plain with harmful results;

- (c) prohibit the growing of crops, the building of structures or the placing of deposits on land located between a river and any protective dikes, embankments or levees;
- (d) cooperate with Local Authorities in determining the geographic extent of floodplain areas and assist such Authorities in regulating the development and use of lands within such areas; and
- (e) in consultation with the Ministry responsible for Local Government, develop regulations providing for the control and management of storm water within municipal areas.

3.4.4 Disaster Risk Management Act of 2023

Provides a direct legal connection between disaster risk governance, land use planning, and flood risk management. The Act establishes the paradigm shift from response to mitigation and reduction of vulnerability. The Act discourages settling in flood-prone and hazard-exposed areas. The Act advocates for flood risk-informed spatial planning in Malawi. Part VI, Sections 32 to 35, introduces a formal mechanism for declaring high-risk areas, including flood-prone zones. The Minister, after consulting with the Ministers responsible for physical planning and local government, may designate land as high-risk and impose restrictions or prohibit human habitation. This creates a clear statutory basis for floodplain exclusion zones, development restrictions, and risk-based zoning decisions.

3.4.5 Land (Amendment) Act, No. 5 of 2022

The Act was enacted to provide for land administration and management in Malawi. Land use planning and zoning helps in proper land management. The legal framework for land tenure, administration, and control of land use in Malawi is established by the Land Act, which includes several provisions directly relevant to floodplain management and land use decisions in hazard-prone areas. Although the Act does not explicitly reference climate change or flood risk, it contains enforceable powers that can be applied to regulate land use in flood-prone, wetland, and riverine areas.

Part VI, Section 31, provides the strongest legal entry point for flood risk control. Section 31(1) empowers the Minister to regulate, manage, and control the use of land by order, regulation, direction, or instruction. Section 31(2) explicitly allows for the regulation of drainage, preservation and protection of the source, course, and banks of streams, as well as the conservation of soil and water resources. This section provides a clear

statutory basis for restricting settlement, cultivation, and construction in floodplains, wetlands, and riparian areas, and for enforcing drainage maintenance as part of land use control.

Part VII, Sections 36 and 37, address trespass, encroachment, and unlawful occupation of land. These sections provide procedures for the removal of persons unlawfully occupying public, private, or customary land through Magistrate or Traditional Courts. In the context of flood risk, these provisions are relevant for addressing encroachment into river reserves, wetlands, and other flood-prone public land, although their application has social implications when vulnerable groups are affected.

Overall, while the Land Act provides robust powers to regulate land use, protect rivers, and control encroachment, it does not mandate flood hazard mapping, climate risk screening, or the use of disaster risk data in land allocation, leasing, or conversion decisions. Its effectiveness for flood risk management therefore depends on operational alignment with the Town and Country Planning Act, Physical Planning Act, Water Resources Act, and Disaster Risk Management Act, as well as stronger oversight of customary land allocation practices.

3.4.6 Environment Management Act, 1996

The Act was aimed at promoting such land use methods as are compatible with the conservation of the biological diversity of Malawi; the selection and management of environmental protection areas for the conservation of the various terrestrial and aquatic ecological systems in Malawi; the establishment and management of buffer zones near environmental protection areas; and the protection of threatened animal and plant species, habitats and ecological systems.

3.4.7 Physical Planning Act of 2016

Provides multi-level planning tools (NPDP, DPDP, Local Plans), development control and enforcement, and mechanisms (Improvement Area Orders, Accelerated Development Area Orders) that can be leveraged to designate and manage flood-prone zones through risk-informed land use controls. Establishes multi-level planning tools (National, District, Local Physical Development Plans) and development control mechanisms. Some provisions can be applied in flood zoning even though flood zoning

is not explicitly mentioned. The Physical Planning Act (No. 17 of 2016) serves as Malawi's legislative framework for regulating and guiding land use planning. Its primary objectives are to ensure orderly development, protect the environment, and mitigate disasters. The Act specifically addresses mechanisms for land development control and includes several provisions relevant to planning in flood-prone zones and building resilience.

The Act outlines various planning tools, including the National Physical Development Plan (NPDP), which provides a strategic spatial framework (Sections 24–28), and District Physical Development Plans (DPDP), which translate NPDP principles at the district level (Sections 29–32). Additionally, Local Physical Development Plans focus on urban layouts, civic designs, and subject-specific plans (Sections 33–37). Each level of planning is required to identify land uses, resource management strategies, settlement patterns, and hazard-prone zones, such as floodplains.

Sections 22–23 address Public Participation and Environmental Safeguards Plans, which include public notification, community consultation, and environmental assessments, particularly when relocations are involved, land boundaries are adjusted, or risk-prone zones are being rezoned.

Sections 62–66 detail Flood Zoning and Risk-Responsive Provisions. These sections establish regulatory designations for areas facing specific flood risks or rapid development pressures:

- Improvement Area Orders: Utilised to redesign poorly planned settlements, including those in potentially flood-prone areas.
- Accelerated Development Area Orders: Enable fast-tracked planning but require the inclusion of risk assessments.
- Vacant Land Development Orders: Apply to underutilised land, potentially including floodplains, to encourage safe development.

Sections 44–50 outline Development Control and Enforcement. All development requires permission, with criteria that include environmental impact, infrastructure availability, and land suitability, along with flood risk measures. Unauthorized development is subject to enforcement actions, removal, or regularisation (Sections 54–60), thereby preventing encroachments into risky floodplain areas.

3.4.8 Town and Country Planning Act of 2014

The Town and Country Planning Act (2014) makes provision with respect to Town and Country Planning. Part III establishes planning authorities including the Town and Country Planning Board. The Act also establishes the appointment of Planning Committees where a Planning Area has been declared by order under Part IV. In line with the Physical Planning Act, all areas in Malawi are supposed to be Planning Areas. The Planning Committee may be committee at a Local Authority or District Council. A Local Authority or a District Council can be designated as a Planning Committee. A Planning Committee established under subsection (1) may, in addition to performing the functions of a Planning Committee under this Act, administer the rules relating to building operations applicable within the area of the Local Authority or the District Council. The Planning Committee is involved in:

- Consideration of plans
- Approval of plans
- Review, amendment and modification of plans
- Preparation of District Physical Development Plans

Section 24 says the purpose and content of District Physical Development Plans shall be:

- a) to elaborate on, and to apply, the principles and policies of the National Physical Development Plan, if any is in existence in so far as they are relevant to the district;
- b) to provide a survey of the conditions, resources and facilities within the district to which it relates;
- c) to identify the growth and service centres, the priorities and possible locations of major public investments and the communication and transportation facilities within the district; and
- d) to formulate a general land use plan for the district.

The Act says a District Physical Development Plan may be made for the whole or part of a district; more than one district; or parts of more than one district;

Provided that a District Physical Development Plan made for part of a district or parts of more than one district or more than one district shall be given a special name as appropriate other than that of the district or districts to which the plan relates.

A District Physical Development Plan shall include:

- a) a technical report on the conditions, resources and facilities of the district;
- b) a statement of policies and proposals directed to assisting the making of decisions on the allocation of resources and the location of physical development within the district;
- c) such information about the description and analysis of the conditions of development in the district as may be necessary to explain and justify the statement of policies and proposals;
- d) background studies and reports;
- e) maps and plans showing present and future land uses and development; and
- f) such other matters as the District Planning Committee may request.

Section 25 says the responsibility for preparation of District Physical Development Plan shall be the Commissioner. The Commissioner may, with the consent of the Minister, delegate the responsibility for preparing a District Physical Development Plan to a Planning Committee.

When a District Physical Development Plan has been approved by the Minister in respect of the whole or part of a district all Local Physical Development Plans and all programmes and projects of development proposed for the district or that part for which a District Physical Development Plan has been approved and all Local Physical Development Plans for areas bordering on or adjacent to the district shall, as far as is practicable, be so formulated and prepared as to have regard to, and take into account, the District Physical Development Plan.

Section 27 establishes Local Physical Development Plans that shall include the following, namely:

- a) *an urban structure plan*, which shall be a land use plan or outline zoning scheme or outline zoning plan for the whole of an urban area;
- b) *an urban layout plan*, which shall be a detailed land use plan of a part of an urban area in which significant physical development is planned or is likely to or has begun to take place or there is need for development, redevelopment or revision and upgrading;
- c) *an urban civic plan*, which shall be a more elaborate design of a special area or areas of an urban area showing layout of buildings, carparking lots and landscaping among other details;

- d) and a subject physical development plan, which shall be a plan concerned with a particular subject matter.

A Local Physical Development Plan other than a subject physical development plan shall be named after the place or area to which it relates and the kind of plan it is. A subject physical development plan shall be named after the subject particular matter with which it is concerned. Land use and flood zoning can be achieved by naming a subject physical development plan called **Floodplain and River Corridor Management Plan**. The Floodplain and River Corridor Management Plan can be concerned with flood risk management and an outline flood zoning scheme where planning or development can be better achieved by the preparation of this subject physical development plan.

3.5 Key Findings from the Review of Policy and Regulatory Frameworks

The main goal in the review of policy and regulatory frameworks was to identify areas of coherence, as well as overlaps, contradictions, and gaps that are critical to the implementation of land use planning and flood zoning.

3.5.1 Legal gaps

The Environment Management Act 1996 advocated for the establishment and management of buffer zones near environmental protection areas. cooperate with Local Authorities in determining the geographic extent of floodplain areas and assist such Authorities in regulating the development and use of lands within such areas. Section 118 of The National Water Resources Act 2013 says for the purpose of preventing or minimizing the risk of flooding and flood damage, the Authority may prohibit the growing of crops, the building of structures or the placing of deposits on land located between a river and any protective dikes, embankments or levees and cooperation with Local Authorities in determining the geographic extent of floodplain areas and assist such Authorities in regulating the development and use of lands within such areas. There is currently no unified, mandatory requirement to operationalise hazard mapping and flood risk declarations within routine development control. While the Disaster Risk Management Act 2023 provides a legal basis for declaring high-risk areas and requires planning authorities to apply prescribed standards once an area is designated, it does not mandate systematic, nationwide flood hazard mapping or proactive risk screening for all development applications outside formally declared high-risk areas.

The Physical Planning Act relies on plan-based zoning and discretionary development control, while the Construction Industry Act focuses on compliance at the construction stage. This leaves a gap at the planning approval stage, where flood exposure, drainage impacts, and cumulative catchment effects are not consistently assessed. Furthermore, the Acts do not prescribe standardised methods, datasets, or thresholds for flood risk assessment, nor do they require the integration of hydrological data from the Department of Water Resources to inform development permissions.

3.5.2 Technical gaps

Traditional zonings have applied the following common land uses: residential, business, institutional, agricultural and open space zonings. Different types of open space fulfil different functions. Certain open spaces have particular importance as nature, cultural heritage or environmental areas and a typically a separate zoning facilitates the management of these areas. Mostly, this zoning provision is made for the development of amenities to meet the needs of tourists and visitors. Other open spaces have a more active role in addressing the sporting and recreation needs of the community. Public open space has an important status because of its contribution to the recreation needs of the general public.

Some special areas of open space cannot designated as public open space, but rather privately owned. The open or green spaces that were along river corridors had a dual purpose of acting as both environmental areas and dealing with floods. However, the flood zoning and land use was not very much emphasised by way of allocating codes with specified allowable land use. As a result, development standards were being inconsistently applied due to lack of guidance. The Physical Planning Act permits zoning, plan review, and the imposition of development conditions; however, it does not mandate the use of updated flood hazard maps, climate projections, or standardised technical parameters when preparing plans or assessing development permissions. Consequently, zoning decisions often rely on static land use categories and generalised offsets rather than risk-based flood extents and future climate conditions. In the wake of climate change, designated land uses for flood zones should be a must.

3.5.3 Institutional gaps

Land use planning and zoning has been mostly motivated by a desire to deal with socio-economic challenges and in some cases disasters, pollution and demand for land. However, with an increased prevalence of flooding, land use planning needs to consider it as well. This means involvement of many sectors in land use planning such as: planners, disaster specialists, water resources managers and environmentalists. The policy review showed fragmented enforcement and limited coordination across land use planning, disaster risk management, water management and construction regulation at the local level. Disaster Risk Management Act, 2023 establishes clear responsibilities for declaring high-risk areas.

Unfortunately, once these areas are declared, routine coordination among physical planning, disaster management, water resources, and construction regulators remains discretionary rather than procedurally enforced. District and city councils have challenges with enforcement due to lack of precise coding of land uses. Approvals, inspections, and enforcement actions occur in silos. In addition, there is limited political will when it comes to enforcement that has resulted in continued development and re-encroachment in flood-prone areas.

3.5.4 Data gaps

All councils that were visited lacked approved flood hazard maps to guide land parcel investment decisions and zoning controls. Land use planning lacks flood data for decision making. Although the Physical Planning Act and the Construction Industry Act provide strong powers for development control, inspections, and enforcement, councils lack adequate data for decision making. Although the Disaster Risk Management Act and Water Resources Act acknowledge flood risk, neither establishes a mandatory checklist and clear criteria for decision making. Lack of data on clearly coded flood zones permits public infrastructure to extend into flood-prone areas, legitimising unsafe settlement patterns and creating long-term public liabilities. 100-year floodlines need to be depicted on township layouts and information on flood hazards needs to be readily available.

3.5.5 Weak Post-Approval and Lifecycle Compliance Monitoring

The Physical Planning Act and Construction Industry Act concentrate enforcement at the approval and construction stages through inspections, stop notices, and demolition powers. There is no explicit requirement for periodic post-construction audits, maintenance checks, or re-certification of flood mitigation measures over a building's lifecycle. There is a need to enforce approvals on any land use changes on existing zones.

3.5.6 Limited Integration of Ecosystem-Based Flood Management

The Water Resources Act permits the protection of riverbanks and water conservation areas, and the Physical Planning Act allows for open space designation and landscaping conditions. However, none of the Acts mandate the preservation or restoration of wetlands, floodplains, or green corridors as essential flood management infrastructure within zoning schemes or layout plans. Nature-based solutions remain discretionary planning options rather than enforceable requirements, resulting in the continued loss of natural flood buffers through incremental development. Land use planning and zoning should have flood risk and environmental management objectives.

3.6 Lessons from Case Studies

There are many guidelines for land use planning and flood zoning from around the world which could provide applicable lessons to Malawi. It is not possible to provide a detailed summary of all these approaches here. However, two case studies of international best practices have been drawn out and presented here.

3.6.1 Guidelines for Development in Flood Affected Areas by The State of Victoria Department of Environment, Land, Water and Planning, 2018

The Guidelines for Development in Flood Affected Areas by The State of Victoria guides on flood risk management that is based on understanding of flood behavior. The purpose of the guidelines is to provide a clear, consistent and transparent process for managing land use and development in flood affected areas in Victoria. They are intended to be used with the land use planning and development system. The guidelines talks about the determination of the design flood for safety considerations. The guidelines were

motivated by the climate change and its impacts on flood behavior as well as current policy setting and the application of climate change policies.

Part Two of the Guidelines for Development in Flood Affected Areas talks about regulation and legislation. Relevant legislation is linked to roles and responsibilities and how these relate to regulating development. Local Floodplain Development Plans and decision guidelines in planning schemes are highlighted. The Local Floodplain Development Plans are supposed to show the flood controls in order to be approved.

Part Three discusses the assessing of development proposals and the guiding principles and assessment criteria for assessing proposals in floodplain development to ensure flood safety.

3.6.2 Floodplain and River Corridor Management Policy, City of Cape Town, Roads and Stormwater Department, 2009

The objectives of the Floodplain and River Corridor Management Policy of the City of Cape Town is to balance flood risk, ecological and socio-economic considerations in developments near rivers and wetlands. The Policy outlines various planning, safety, environmental and socio-economic considerations. It highlights requirements for plans/sectoral plans and flood management and public safety. Guidance on technical aspects related to floodline determination, ecological buffers and geomorphological processes is provided. Socio-economic considerations are also highlighted. Finally, guidance notes on assessment of proposals is provided including zoning schemes, structure plans and related policies, land use planning applications; new development rights, new development rights on existing building footprint, building plan applications (exercising of existing development rights), development layouts. A detailed Framework for the Assessment of Proposals is provided in the Policy document.

3.7 Proposed Measures upon Review of Policy and Regulatory Frameworks, Stakeholder Consultations and Lessons from Case Studies

3.7.1 Risk-Informed Development (RID) planning and permitting guidelines

Integrated development plans should aim at reducing the impact of flooding on community livelihoods. Land use planning and zoning should aim at safeguarding human health, protecting natural aquatic environments and improving and maintaining recreational water quality.

3.7.2 Catchment based flood risk management guidelines

There is a need for a framework for the management of land use, development and activities near rivers with an overarching purpose of minimising potential flood damage as well as enhancing and protecting natural environment. There is a need to introduce binding regulations under the Physical Planning Act to mandate floodlines as a standard component of all National, District, and Local Physical Development Plans. These flood maps with clear floodlines should be based on officially endorsed flood maps from DODMA, Water Resources, and DCCMS, incorporating multiple return periods already in use, and must inform zoning, subdivision, and infrastructure siting decisions and requirements. Planning committees should not approve any development application unless it demonstrates consistency with the applicable flood zones. The requirements of development in flood zone should be enforceable. Riparian buffers and floodplain reserves as non-developable land within local plans should have a clear criterion.

3.7.3 A guide on flood zoning, land use planning and assessment of proposals

There is a need to demarcate flood zones with specific requirements for development. This can be achieved by a 'flood' subject physical development plan, which shall be a specific land use and development plan concerned with dealing with floods in a particular planning area. According to the Town and Country Planning Act, a subject physical development plan shall be named after the subject particular matter with which it is concerned. In this case, appropriate land use planning and flood zoning can be achieved by having a subject matter physical development plan that can be called **Floodplain and River Corridor Management Plan**. The Floodplain and River Corridor Management Plan can be concerned with flood risk management and an outline flood

zoning scheme in a town or city. This is important where planning or development can be better achieved by the preparation of such a subject physical development plan.

Based on Section 27 of the Town and Country Planning Act, it can be made mandatory that all Local Physical Development Plans in planning areas according to Part VI (Sections 32 to 35) of the Disaster Risk Management Act of 2023 have been declared as high-risk areas or flood-prone zones.

In addition of highlighting the required land use and zoning based on localised conditions and flood risk, the **Floodplain and River Corridor Management Plan** can also provide criteria for assessing development proposals in planning area to ensure flood safety based on the development proposal.

4 SETTING THE CONTEXT FOR LAND USE PLANNING AND FLOOD ZONING

4.1 Defining the Problem

The intensity, frequency and number of people affected by flood disasters appear to be increasing, a trend mainly attributed to population growth and environmental degradation, particularly the removal of trees in the catchment areas. High population densities add to the pressures on the environment, and force people to live in flood vulnerable areas. Climate change is likely to further exacerbate flood disasters due to more frequent and severe extreme weather events. Climate change continues to have impacts on precipitation, evapotranspiration, soil moisture, runoff and river discharge, and water quality. Climate change has exacerbated floods risks. Malawian cities and towns face the challenges of balancing flood risk, ecological and socio-economic considerations in developments near rivers and wetlands. Climate change and changing weather patterns have increased the prevalence of flooding in cities and towns. Increasing population and the resultant demand for land have led to developments near rivers and wetlands.

Malawian towns and cities have many floodplains near rivers and wetlands. This poses a challenge in managing development in flood affected areas. The risks posed by flooding are not equal from one floodplain to another, and the level of risk varies even within a discreet floodplain area. Understanding flood behaviour is crucial to any assessment of flood risk and coming up with flood zones.

Climate change and variability have resulted in increased flood risk. Population growth means continuing growth in urban areas. This has created pressure to extend development into high flood risk areas or areas affected by flooding and previously set aside as 'too difficult' to develop. Managing this development is important to reduce vulnerability and avoid economic losses associated with flooding of built up areas.

These factors support a need to provide a guide on how proposals to use and develop flood affected land are assessed.

Part 1 provides a guiding framework for the management of land use, infrastructure development and activities near rivers and wetlands in order to minimise potential flood damage, reduce pollution and protect natural environment.

Part 2 of the provides the methodology that can be used by planning authorities when assessing development proposals in high flood risk areas.

4.2 Need for a Guide on Land Use Planning and Flood Zoning

The review of policy and regulatory frameworks uncovered legal, technical and institutional gaps in land use planning and flood zoning. Approaches to land use and development planning at town and city levels have been prepared and there are development planning and approval committees that are active. However, to date there has been no single coherent approach or “guide” land use planning and flood zoning in Malawi. Much of the land use planning and flood zoning do not follow international best practice. While policy and regulatory provisions have been made in the Water Resources Act, 2013; Disaster Risk Management Act, 2023; Environmental Management Act, 2017; Physical Planning Act, 2016 and others, to regulate infrastructure development planning and delivery, there is no detailed guidance on land use planning and flood zoning.

The Environment Management Act (EMA), as an overarching legislation for environmental management in Malawi, accords specific responsibilities to various sectoral authorities on matters pertaining to environmental planning and management. The Act requires the Director General of MEPA to ensure that, prior to implementation, all projects prescribed for environmental impact assessment shall undergo comprehensive assessment in order to enhance beneficial impacts and mitigate adverse impacts. The Act also prescribes projects which require either ESIA and/or ESMP studies to form part of the implementation cycle. MEPA is required to approve the project including the site selection and appraisal for infrastructure. The Land Act of 2016 was enacted to provide for land administration and management in Malawi. The Act groups land into two categories, “private land” and “public land”. Public land comprises Government land and unallocated customary land. According to the Land Act, development of all land in Malawi should undergo planning and development approval by local/district and city councils. This means that District Council and City Council should approve of the site design and monitor construction as well as approve the construction design in conformity with policies, laws, bye-laws and national standards. Section 118 of the Water Resources Act of 2013 says that the National Water Resources

Authority shall cooperate with Local Authorities in determining the geographic extent of floodplain areas and assist such Authorities in regulating the development and use of lands within such areas.

This guide on land use planning and flood zoning therefore aims to provide a consistent basis for implementing coded flood zones in Malawi in alignment with various policy and regulatory frameworks. The guide provides simple best practice solutions to developing infrastructure closer to rivers. It provides guidelines for land use planning at town and City levels. The Guide provides a basic understanding of flooding and flood hazard mapping, including advice on how to develop flood zones.

4.3 Understanding Flood Behaviour

It is believed that a well-managed river / wetland is a valuable resource for improving the quality of life and aesthetic nature of an urban area and provides benefits for public health, recreation and economic growth. This guide outlines the procedure for managing development adjacent to rivers and wetlands with particular emphasis on land use and flood zoning. Other critical considerations include aquatic and riparian ecology as well as socio-economic factors.

Flood zoning is a land use tool for managing areas at risk of flooding. It designates specific zones based on flooding likelihood influenced by catchment characteristics and rainfall patterns. Communities use flood zoning to implement regulations that reduce flood risks.

In recognition the potential impact of flooding on community livelihoods and economic development, efforts have focused on developing appropriate adaptation measures and incorporating climate change into long-term land use planning. One of the proposed adaptation measures is land use planning and special flood zoning with codes. Any proposed land use / development / activities / buildings in the specially coded flood zone must follow applicable floodplain, geomorphological and ecological buffer requirements. This guide therefore prescribes these land use requirements.

Land use planning is important in safeguarding human health and protecting the environment. According to City of Cape Town's Floodplain and River Corridor Management Policy (2009), the management of land use, development or activity adjacent to rivers and wetlands is important for the following reasons:

- It is far more cost effective, in the long term, to develop in areas where the threat of flooding is infrequent and the severity of flooding is minimal as opposed to the retrospective implementation of flood mitigation works which would generally be extremely costly and sometimes prone to catastrophic failure when flood flows exceed the design capacity of infrastructure.
- Climate change predictions indicate greater variability in the intensity and magnitude of storm events. These uncertainties pose significant challenges for the management of major drainage systems.
- Encroachments result in ecological degradation, often reducing water quality and precipitating loss of ecological resources irreversibly. Since modifications to natural systems may disrupt natural aquatic and geomorphological processes they require a long term maintenance commitment. Therefore urban activity must be managed in such a way that maintenance activities can be adequately conducted.
- To promote a sense of place and recreational enjoyment for communities.

This guide is about managing, or reducing, the impact of flood disasters on communities and the economy by regulating land use within demarcated flood zones. It provides approaches for dealing with land use, development or interventions near rivers and wetlands to limit flooding disasters.

In terms of zoning regulations and bye-laws, each city or district council is supposed to have specific zoning regulations that help to manage development in flood-prone areas. In terms of building requirements, properties in high-risk flood zones must adhere to stricter building codes to minimize flood damage. This may include elevating structures above base flood elevation levels or specific return period floods. In terms of insurance requirements, the regulatory frameworks could mandate that properties in high-risk flood zones must carry flood insurance depending on prevailing mortgages. The spirit of this guide is to provide a coherent approach to land use planning and flood zoning which is essential for codified land use planning where developers, property owners, renters, and

anyone can appreciate the flood risks in a particular area. This information helps to ensure compliance with bye-laws and protects against potential flood damage. The codified land use planning and flood zoning is expected to be fed into the specific city or district council's bye-laws.

Theoretically, zoning regulations for flood prone areas are crucial for land use, property development and insurance requirements, as properties are classified into various flood zones based on their risk of flooding. In understanding of flood zones, there is a need for flood zone classifications depending on flood return periods. For instance, areas with a 1% chance of flooding annually require different considerations, in comparison with High-Hazard Areas (Zones with a 26% to 50% chance of flooding in any given year) or Low-Hazard Areas (Areas with less than a 26% chance of flooding annually), though flooding can still occur during extreme weather events. However, Cities or districts in Malawi do not have detailed zoning regulations that are based on flooding chances or flood exceedance probabilities.

4.4 Understanding Floods for Land Use Zoning Purposes

A flood is defined as an overflow of a large amount of water over areas that are not normally submerged. This is a natural occurrence and is considered if there are no negative impacts. Flood zoning deals with delineating areas specifically for flood risk management by regulating development and land use. However, not all floods are the same, smaller floods happen almost every year or two and submerge smaller areas. Larger floods occur every few years and inundate bigger areas while causing more disruption and damage. Very large events happen even less frequently but cause massive damage and disruption and affect more people.

This guide has adopted a people-centred approach to dealing with floods with a focus on how communities must understand threats posed by floods in order to avoid them. Flooding disasters are partly caused by external hazards, but they also stem from vulnerability especially when people and infrastructure are located in wrong places at the wrong time. The current policy and regulatory frameworks have attached too much importance on the required distance from rivers, wetlands and rivers when talking about flood zoning.

Flood zones are supposed to be defined by variable distances from rivers, wetlands and rivers from areas that could be submerged in case of flood hazards. These distances are dependent on the flood sizes and shape and size of the channel. Flood zoning maps delineate the areas that could be submerged by water in case of a given flood size. Flood zones show mapped areas that risk being inundated by floods of given sizes. Table 4.4-1 shows the relationship between recurrence interval and flood sizes.

Table 4.4-1 The relationship between recurrence interval and flood sizes (GOM, 2017)

Flood size	Hydrological recurrence interval	Probability of happening in any year
Annual		Almost 100%
Small	1:5	20%
Medium	1:20	5%
Large	1:50	2%
Very Large	> 1:50	< 2%

To better understand how different floods can be managed with respect to flood zoning, this Guide define floods based on recurrence interval by considering the average interval between rainfall or flood events equaling or exceeding a specified severity.

4.5 Mission, Vision and Aims for a Guide

4.5.1 Mission

To guide land use planning by safeguarding that development and associated building activities within or adjacent to flood prone areas have a balanced consideration of potential flood risk, environmental impacts and socio-economic needs.

4.5.2 Vision

Ensure that all developments within flood prone areas are planned and designed in accordance with best practices and the requirements of land use planning and flood zoning.

4.5.3 Aims

The aim is to inform land use planning and development in high flood risk areas, to protect the environmental integrity of aquatic resources and to ensure that permitted development enhances the aesthetics and character of the adjacent rivers / wetlands.

The considered applications and use of this land use planning and flood zoning guide are in the following contexts:

- Act as a communication tool for promoting safer construction practices and effective land management to mitigate flood risk.
- Acting as guidelines for establishing local physical planning codes for land use and appropriate development requirements - for enforcement and implementation of stringent enforcement mechanisms to ensure compliance with established land use zoning and building codes.
- Acting as a framework for existing infrastructure strengthening, operation and maintenance as well as establishing the need for relocating communities or infrastructure from high-risk zones to safer areas.
- Addressing the challenges of multiple land ownership in hazard-prone areas to improve land use planning and emergency response strategies.
- Crafting a detailed zoning ordinance that governs land use in regions susceptible to various natural hazards in order to minimise damage, and enhances community resilience.
- Inform insurance guidelines

4.6 Rationale

Based on the findings from the case study areas of Lilongwe City and Karonga and Phalombe districts, it was observed that the pressure to develop is significantly high. People are developing on any possible open land that they can get. This has resulted in development in high flood risk areas and encroaching of environmental buffers. In addition, some of the wanton development has an impact on the environment, land and water resources. It is clear that land use planning and flood zoning could help to protect the environmental integrity of aquatic resources and to ensure that only permitted development takes place adjacent rivers / wetlands. Based on the rationale, the approach of the guide is based on the analysis of how Political, Economic, Social,

Technological/engineering, Legal, and Environmental external factors affect land use and development in cities and towns.

This guide provides a multi-criteria approach for handling development or building proposals within and adjacent to flood prone areas and environmental buffers. The Guide aims to achieve the following outcomes; reducing the impact of flooding on people and properties, protecting livelihoods, reducing pollution, promoting social inclusion, enabling healthy and safe living and safeguarding human health, aquatic environments and improving and maintaining recreational water quality.

4.7 Regulatory Mandate

The legal considerations to ensure that administrative actions with respect to land use planning applications are lawful, reasonable and procedurally fair are mainly based on the following regulatory frameworks:

- Physical Planning Act of 2016,
- Environmental Management Act of 2017,
- Water Resources Act of 2013,
- Town and Country Planning Act of 2014, and
- Disaster Risk Management Act of 2023.

4.8 Scope and Application

This Guide is applicable to land use planning, development or building or proposed interventions that are adjacent to flood prone areas, rivers or wetlands or in the vicinity of formal stormwater management systems and assessment of proposals. This guide has not been prepared to be used as an operational guide but rather as a strategic guide. A strategic guide outlines simple integrated steps towards land use planning and flood zoning to be applied as part of climate adaptation and flood risk reduction and saving lives and livelihoods in the medium and long term.

4.9 Strategic Objectives

The main objective of this Guide is to inform land use planning and development with special emphasis on flood zoning in towns and cities thereby limiting or reducing

exposure to flood risks. The ultimate goal is to avoid detrimental and uneconomic use of floodplains, thereby protecting life, livelihoods, property and community infrastructure.

The specific objectives are:

- To protect the natural flood carrying capacity of rivers and wetlands.
- To protect and enhance the intrinsic value and the environmental goods and services provided by rivers, wetlands and associated riparian areas and floodplains.
- To facilitate the beneficial integration of rivers into the town and urban landscape by creating an aesthetically pleasing public resource which will ultimately allow for the social and economic advancement of communities adjacent to rivers and wetlands.
- To provide an effective decision making tool for officials, developers and consultants by introducing an element of predictability with regard to applications for development along rivers / river corridors and adjacent to wetlands.
- To promote sustainable development from engineering, environmental and socio-economic perspectives.
- To guide decision making on land use and development applications

4.10 Audience: for Whom is the Guide Written

This guide has been developed to highlight principles of land use planning and flood zoning and to showcase best practices that should be applied in Malawi. The guide has been designed with a focus on planning authorities such as the Physical Planning Council that are established under the Physical Planning Act, 2016 and planning authorities such as Town and Country Planning Board that are under the Town and Country Planning Act of 2014. It can also be used by stakeholders, partners and practitioners of these planning authorities that are applying for approvals of proposed development within a planning area.

5 GUIDING PRINCIPLES (PART 1 – LAND USE PLANNING)

This chapter aims to provide the reader with general guiding principles that should help in land use planning and flood zoning at town and city levels. The guiding principles have been compiled from an extensive review of literature, findings from stakeholder consultations and review of case studies across the globe. This guide has adapted most of the technical prescriptions from the Floodplain and River Corridor Management Policy of the City of Cape.

According to the Town and Country Planning Act, a Local Physical Development Plan can include a subject physical development plan, which shall be a plan concerned with a particular subject matter. The guiding principles herein can help with developing a subject physical development plan that considers land use and flood zoning. In this case, appropriate land use planning and flood zoning can be achieved by having a subject matter physical development plan that can be called a **Floodplain and River Corridor Management Plan**. By having the **Floodplain and River Corridor Management Plan** as a subject physical development plan under Local Physical Development Plan in line with Town and Country Planning Act, the Plan can be legally-enforceable and applied uniformly throughout the community to all privately and publicly owned land within flood-prone area.

5.1 Guiding Principle 1: Land use planning to have a flood zoning plan in all high flood risk areas

Dealing with floods requires an understanding of how floods occur and the options to reduce their impacts. The guiding principle is that land use planning, development or building or activity proposals adjacent to rivers or wetlands should have a clear subject matter physical development such as a **Floodplain and River Corridor Management Plan** in flood prone areas or areas declared as high flood risk areas.

5.1.1 Guidance notes

- Land use, development or activities near rivers and wetlands must be appropriate for the anticipated degree of flood risk whilst minimising associated environmental impacts and sustaining a sense of place and urban form.
- Cognisance must be taken of applicable requirements and recommendations contained in various plans and related documents. Various categories of plans

that should be consulted where available include: flood risk management plans, urban structure plans, urban civic plans, urban layout plans, drainage master plans and catchment management plans.

- Sound engineering and environmental judgment should be applied in the absence of these guide plans.

5.1.2 Strategies

- Consult and review the Local Physical Development Plans that shall include the following:
 - an urban structure plan, which shall be a land use plan or outline zoning scheme or outline zoning plan for the whole of an urban area;
 - an urban layout plan, which shall be a detailed land use plan of a part of an urban area in which significant physical development is planned or is likely to or has begun to take place or there is need for development, redevelopment or revision and upgrading;
 - an urban civic plan, which shall be a more elaborate design of a special area or areas of an urban area showing layout of buildings, carparking lots and landscaping among other details; and
- Prepare a subject physical development plan for flood zoning and land use planning i.e. a Floodplain and River Corridor Management Plan
- Ensure that the **Floodplain and River Corridor Management Plan** has flood hazard maps, demarcated flood zones and land use plans showing present and future land uses and development requirements.

5.2 Guiding Principle 2: Flood Management and Public Safety

Rivers and their associated floodplains can convey significant volumes of water under flood conditions. The flood waters pose a serious threat to residents and they also raise concerns about public safety. The flood risk to people (including emergency services personnel) should be kept to acceptable safety thresholds. The ability to wade or gain vehicular access as well as the stability of structures such as dwellings or boundary walls are deemed seriously compromised under 100 year floodline which is a high hazard zone. No new or additional development rights should be granted to properties located within the high hazard zone. The permissible extent and nature of land use, development or activities within floodplains should be subject to stringent evaluation and

control in the interests of public safety. In particular, obstruction to the free flow of water within the 20-year floodline area shall not be permitted in line with the Water Resources Act of 2013 which prohibit the construction on submersible lands or dikes, levees or other structures likely to hinder the run-off of flood water. However, between the 50 and 100-year floodlines, some developments or activities may be permitted, subject to the conditions in the proposal assessment criteria.

Developments with particular evacuation or emergency response issues and high risk developments should only be permitted above the 100-year floodline. Any proposed development or redevelopment within the floodplain must be supported by a report by a registered professional engineer to ensure that any new or existing structure can withstand the forces and effects of floodwaters. All building plans within the floodplains must be supported by a report by a registered professional engineer.

5.2.1 Guidance notes

- Determine the flood risk based on the frequency of flooding and the potential economic, social and environmental consequences to the community.
- Compute risk as a function of the hazard, exposure, vulnerability and capacity.
- Any development in a flood affected area, including associated infrastructure, should be planned to avoid or minimise the flood damage potential.

5.2.2 Strategies

- Conduct hydrological studies and hydraulic analysis to determine the geographic extent of the floodplain areas and flood zones.
- Analyse the river runoff under different scenarios (present state and future development) including sensitivity analysis.
- Consider the future impacts of climate change and if there will be impacts on the flood zone by conducting climate projections.
- Determine the floodplain (coded flood zone area), which is defined as the controlled area zone that is susceptible to inundation by the 100-year flood, as indicated in Figure 5.2-1.
- Determine the high hazard zone which is defined as an area with water depths above 0.5 m and velocities above 2 m/s. as indicated in Figure 5.2-2. Water depths and velocities were computed for Lilongwe River of up to 4.5 m and 3.1

m/s respectively as shown in Table 5.2-1. This was used to determine the flood hazard zone for the flood plain including low, medium and high flood risk zones within the controlled flood zone.

- Flood depth and velocity are the most important determinants of flood hazard are. Fast-flowing, shallow water, or slow-moving, deep water can unbalance people and sweep them away. Buildings can be undermined or damaged by floodwater and debris. The contents of buildings can also be severely damaged or destroyed. There is a need to determine the hazard zones based on velocity and depth profiles' considerations as illustrated by the determined sample water depths and velocities for Lilongwe River shown in Figure 5.2-3.

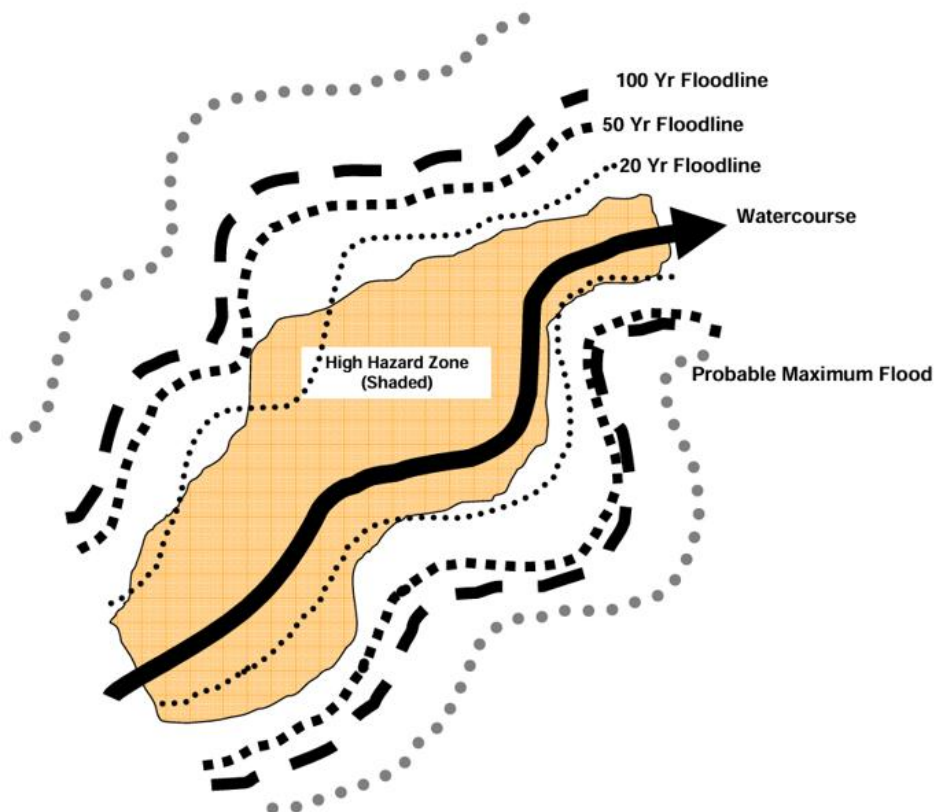


Figure 5.2-1 Flood zoning conceptualization on a plan layout (Source: CAPETOWN FLOODPLAIN AND RIVER CORRIDOR MANAGEMENT POLICY, 2009)

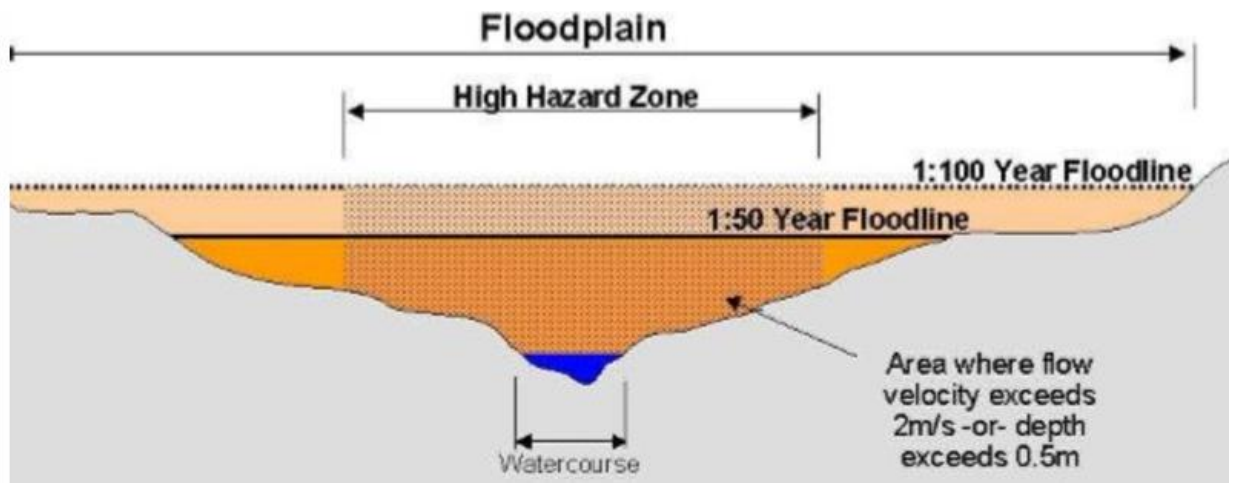


Figure 5.2-2 Flood zoning conceptualization on a vertical cross section (Source: CAPETOWN FLOODPLAIN AND RIVER CORRIDOR MANAGEMENT POLICY, 2009)

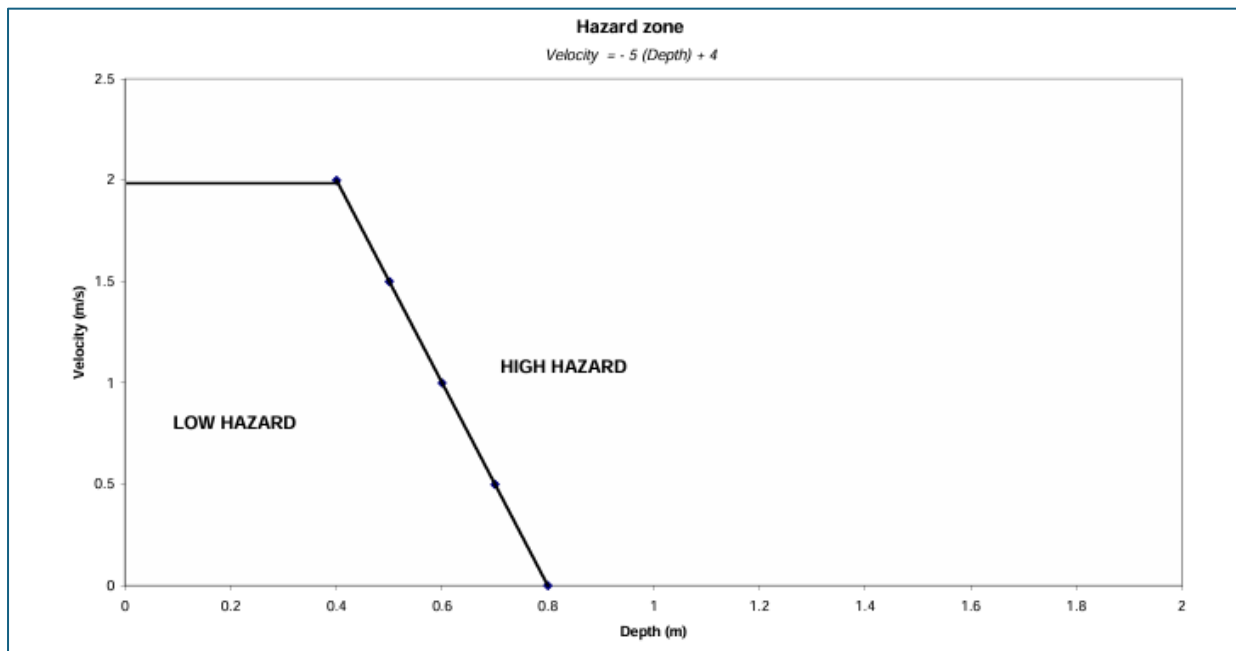


Figure 5.2-3 Flood hazard zoning criteria for velocity and depth profiles

Table 5.2-1 Sample water depths and velocities for Lilongwe River

Lilongwe River	Lilongwe Bridge	Flood Size	Lowest Bed Elevation	Water Surface Elevation	Water Depth	Top Width	Velocity	Distance from River Centre Line
		(m ³ /s)	(m)	(m)	(m)	(m)	(m/s)	(m)
Lilongwe	99	400	1033.87	1037.99	4.12	44.72	3.05	22

Lilongwe	98	400	1033.56	1038.01	4.45	44.67	2.57	22
Lilongwe	97	400	1033.87	1037.07	3.2	39.56	4.64	20
Lilongwe	96	400	1033.36	1035.31	1.95	37.63	6.49	19
Lilongwe	95	400	1033.15	1036.41	3.26	42	3.72	21
Lilongwe	94	400	1032.7	1035.87	3.17	37.87	4.47	19
Lilongwe	93	400	1032.11	1035.85	3.74	38.87	3.71	19
Lilongwe	92	400	1032.02	1035.76	3.74	39.79	3.43	20
Lilongwe	91	400	1031.9	1035.69	3.79	41.88	3.17	21
Lilongwe	90	400	1031.13	1035.7	4.57	44.53	2.68	22
Lilongwe	89	400	1031.04	1035.56	4.52	39.55	2.87	20
Lilongwe	88	400	1030.57	1035.58	5.01	41.73	2.45	21
Lilongwe	87	400	1029.94	1035.58	5.64	44	2.15	22
Lilongwe	86	400	1029.94	1035.51	5.57	42.51	2.3	21
Lilongwe	85	400	1029.46	1035.48	6.02	41.68	2.25	21
Lilongwe	84	400	1029.19	1035.45	6.26	41.24	2.22	21
Lilongwe	83	400	1029.12	1035.5	6.38	51.17	1.68	26
Lilongwe	82	400	1029.09	1035.5	6.41	55.94	1.54	28

5.3 Guiding Principle 3: Floodline Delineation

Delineated floodlines should be used in coming up with flood zones to inform the design, location and planning of infrastructure. The floodlines help to ensure that the construction of any infrastructure is restricted away from the design return period flood delineated flood-zone and/or to formulate alternative solutions to protect structures within specific flood zones against flooding.

5.3.1 Guiding notes

- In the absence of floodlines for the planning area, the planning authorities must procure the services of a suitably qualified registered engineering professional (with experience in hydrology and hydraulics) to undertake such determinations.
- The current extent of the floodlines must be evaluated against ultimate development scenario.

5.3.2 Strategies

- Consider to undertake the floodlines delineation with two conditions or scenarios analyses, namely:
 - Scenario 1: Existing, natural river, stream and floodplain (status quo), and

- Scenario 2: Stream, river and floodplain with potential future development in the floodplains
- All floodlines must be based on the theoretical energy level as opposed to the water surface level.
- Consider providing a road between the high hazard floodline and the area with little or no flood risk so that all those building in the flood zone can be easily identified by any development across the border access road.

5.4 Guiding Principle 4: Ecological and Environmental Buffers

The Malawi Environmental Protection Authority together with relevant lead agencies is mandated to protect river banks and lake shores according to Section 47 of the EMA 2017. This means rivers and wetlands with their adjacent riparian areas and associated fauna and flora must be protected or “buffered” from human activities that adversely affect the rivers and lakes. Ecological and environmental buffers act as protection zones or boundaries that provide continuous corridors and habitat for flora and fauna. Buffers also provide other benefits such as water quality improvement of point or diffuse sources of pollution and stream bank and erosion protection. The flora within the buffer areas act as a sieve of point or diffuse sources of pollution unlike hardened catchments in urban areas that easily carry waste. In addition, buffer areas can provide socio-economic benefits in the form public open space, opportunities for recreation and environmental education / awareness, and enhancement of riverside visual appearance and property values. In instances where rivers have been canalized, buffers are still required to aid maintenance and, in some instances, to allow adequate space for possible future restoration activities.

5.4.1 Guiding notes

- Determine ecological buffer widths based on MEPA gazetted limits for protected zones along banks of a river or shores of a lake
- Rivers and shores with high ecological condition and importance require a wider buffers which are determined by MEPA by looking at:
 - Size and condition of the river or lake
 - Existing interests in the land
 - Nature of proposed activity
 - Geographical location of a river or lake

5.4.2 Strategies

- Measure the ecological and environmental buffers from river “top of bank” or outer edge of the wetland/lake according to nationally accepted guidelines / methodologies e.g. by Department of Water Resources or Department of Land Resources.
- Maintain buffers of width between 10 m and 40 m for rivers and up to 75 m for wetlands and a minimum buffer of 10 m is required for concrete canals.
- Adjust buffers to accommodate wetlands in close association with a river.
- Procure the services of a suitably qualified freshwater ecologist to recommend appropriate buffer widths.
- Show the buffer zones on the flood zoning maps
 - Perform site or case specific adjustment of the recommended minimum buffer width for rivers and shores with high ecological condition and importance or in the presence of sensitive habitats, fauna or flora which may require wider buffers for adequate protection.
 - Adjust the buffers where the intensity of adjacent land use and the nature of anticipated impacts is significantly high to mitigate against identified impacts.

5.5 Guiding Principle 5: Erosion and Sedimentation Control

Many high flood risk areas are also prone to erosion and sedimentation. The land use plan should include measures to prevent soil erosion and manage sedimentation, which can lead to water quality degradation and environmental harm. Erosion can occur due to various factors, including construction activities in the floodplain that disturb soil, leading to increased vulnerability to wind and water erosion. The land use must outline specific control measures tailored to the site conditions and land use activities.

5.5.1 Guiding notes

- Carry out a site assessment or site specific studies to identify areas prone to erosion and sedimentation, including slopes, drainage patterns, and existing vegetation.
- Come up with erosion control measures and implement practices such as vegetation cover to reduce soil erosion during development.

- Come up with sediment control measures and use techniques like sediment traps and check dams to capture and manage sediment runoff before it reaches water bodies.
- Come up with Best Management Practices (BMPs) as per town and City byelaws.

5.5.2 Strategies

- Identify Erosion Risks: Assess the potential for erosion based on site conditions, geomorphological processes and land use activities.
- Select Appropriate Controls: Choose suitable erosion and sediment control measures based on the identified risks and site characteristics.
- Prepare an Erosion and Sedimentation Control Plan as an appendix to the **Floodplain and River Corridor Management Plan**: Clearly outline the selected measures and responsibilities

5.6 Socio-economic Considerations

Rivers and lakes are public resources that if effectively managed can result in high economic growth opportunities but if not can result in community vulnerability challenges. Land use planning and development along rivers must recognize the unique challenges and opportunities.

5.6.1 Guiding notes

- Assessment of developments adjacent to rivers, rivers and wetlands must recognize the economic potential and promote developments which actively incorporate unique challenges and opportunities of the planning area.
- Implement a coherent multidisciplinary approach to managing land and water resources in flood risk areas by identifying and satisfying social, economic and environmental priorities.

5.6.2 Strategies

- Reduce the impact of flooding on people and properties through land use and flood zoning and a society focused land use plan: economic, social and environmental systems supported by the river

- Safeguard human health by preserving rivers and natural ecosystems and maintenance of ecosystem goods and services
- Always maintain a “River Corridor” which comprises the river and/or associated wetlands (as applicable), the floodplain, the ecological buffer and the area required for specific aesthetic, recreational and/or socio-economic needs. This combined area must be managed in an integrated manner which balances the flooding, environmental, social and economic issues.
- Ensure to provide river corridors for all declared high flood risk areas within planning areas. Retain natural drainage corridors with vegetated buffer zones at least 30 metres wide along each side of a river to: maintain natural drainage function, habitat and landscape values; to minimise erosion; and to reduce polluted surface runoff from adjacent land uses.
- Retain natural vegetated buffer zones at least 75 metres for wetlands.

5.7 Case Study of Lilongwe River Flood Line Delineation

This case study has been selected to illustrate the practical application of the guiding principles highlighted in this guide. The floodplains of Lilongwe River downstream the New Lilongwe Bridge have been used as a case study. This floodplain and the catchment (see Figure 5.7-1) have distinctive characteristics that help to highlight aspects of flood zoning. Since the risks posed by flooding are not equal for different catchments, this case has been used for illustration purposes only. The case study has been chosen because it has a combination of formal and informal settlements. In addition, historically it had areas that were left as green spaces for flood risk management or were previously set aside as ‘too difficult’ to develop but have now been developed resulting in increased flood risks.

5.7.1 Purpose of Flood Zones

The flood zone land use is needed because of the desire to achieve the following:

- Protect human life and health, and provide safety from flood hazard
- Minimise flood damage to property and associated infrastructure
- Protect and enhance the environmental features of rivers and floodplains
- Enhance public functions such as recreation (passive and active) and growth management and thus shaping future development patterns to meet community needs while preserving and conserving areas to maintain their natural state.



Figure 5.7-1 Case Study Area for the Development of the Guide

Using this case study, it was found from historical imagery that the Lilongwe City Council has created special environmental buffers along major rivers. These buffers are often provided as buffer zones to protect people from flood hazards as well as to protect the environment. Any incompatible or sensitive development such as between residential development, commercial and institutional development is not accepted under the Environmental Management Act. The City Planning and Development Committee does not approve of any development in designated river corridors.

5.7.2 Development Standards

Development standards are applied in areas designated for river corridors, parks and open spaces land use. The City Council has specific prohibitions in their policies and byelaws.

5.7.3 Delineation of flood zones

Sample flood zones were delineated along Lilongwe River downstream the New Lilongwe Bridge as shown in Figure 5.7-2. The Department of Disaster Management Affairs has produced flood hazard maps that can be applied in some districts in Malawi.

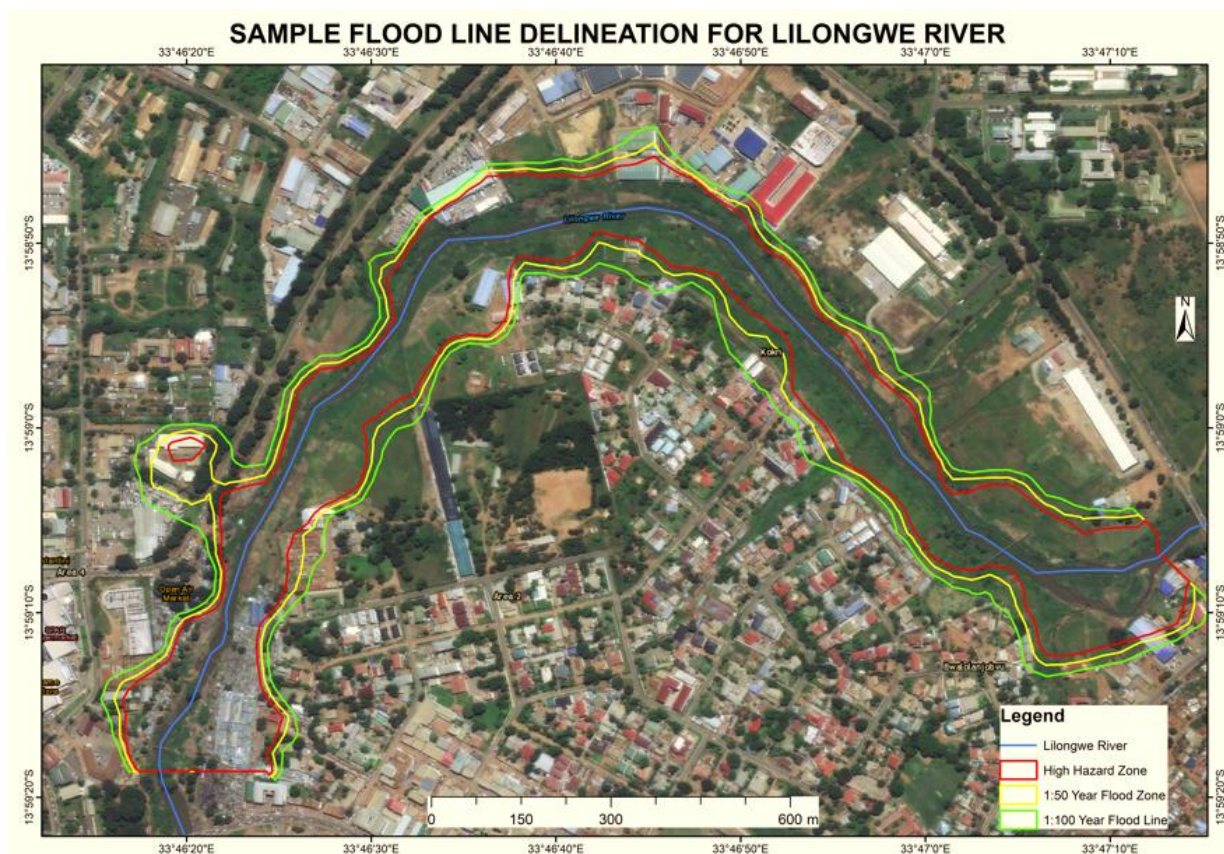


Figure 5.7-2 Sample Flood Lines for Lilongwe River

Based on Figure 5.7-2, there is some formal and informal infrastructure below the 100-year floodlines. Some of the infrastructure appear to have been constructed during the past 20 years. This shows lack of adherence to designated land uses in flood zones or river corridors. It was reported that this could be due to:

- Lack of enforcement
- Lack of political willpower to maintain development standards

There are informal structures along the floodplains. Some structures were approved to be constructed along river corridors. This guide has come up with a designated flood zone as shown in the sample in Figure 5.7-3. Development in the flood zone needs to be guided by the guiding principles in this guide. Development restrictions need to be enforced. Assessment of proposals needs to follow prescribed procedures. Meanwhile, the Government of Malawi under the Regional Climate Resilience Programme (RCRP) has mandated all City and District Councils to come up with risk informed spatial plans. The development of the spatial plans is in progress. These spatial plans will have designated flood hazard zones that should be subject to the prescriptions in this guide.

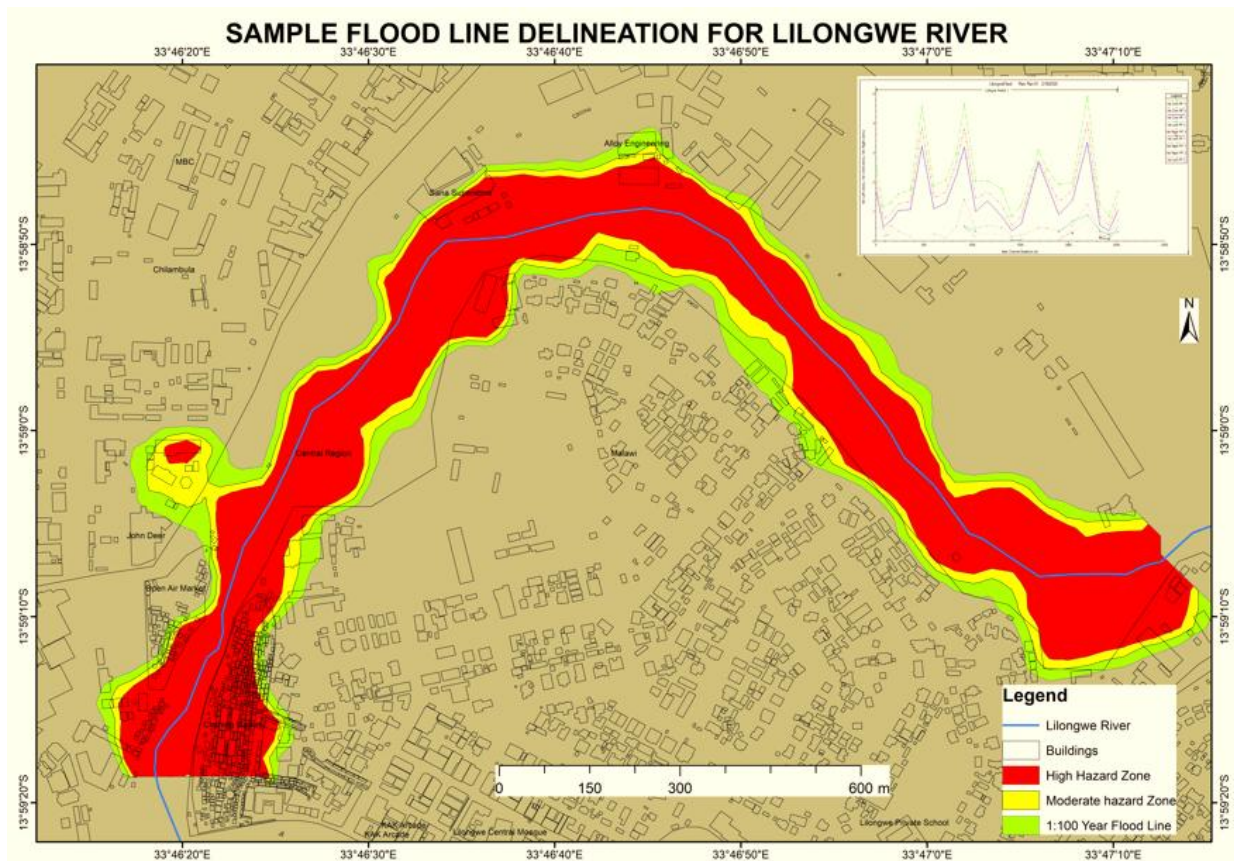


Figure 5.7.3 Designated flood zones on spatial plans

6 GUIDING PRINCIPLES (PART 2 – DEVELOPMENT RESTRICTIONS AND ASSESSMENT OF PROPOSALS)

This chapter aims to provide the reader with general guiding principles that should help in land use at town and local levels with regards to development restrictions and assessment of proposals in flood prone areas. The land use planning and flood zoning classifies areas into categories such as 'high risk', 'medium risk' and 'low risk'. Some zones allow development but with restrictions or specific measures in place. The goal is to protect people and property from flood hazards. Planning authorities need to incorporate flood zoning into building codes and land use policies or plans. This ensures that development (see its definition) can withstand potential flood events.

It should be noted that the flood zone and the floodlines do not represent the full extent of flooding. Flood zoning and land use planning is about planning for an acceptable level of risk.

Upon introducing land use planning and flood zoning, there is a need for criteria for the assessment of proposals and applications pertaining to development near rivers and wetlands. Any new land use, development, activity or building must be appropriate for the anticipated flood risk and other requirements. Furthermore, ecological buffer and socio-economic requirements need to be met. River corridors to allow access to the river for maintenance must be respected. Development restrictions could mandate some facilities to be located away from the 100-year recurrence interval flood zone. For instance, there are also services that the community expects in times of flood. Buildings that are linked to these services include ambulance stations, police stations, fire stations, communication facilities, transport facilities, community shelters and emergency service facilities.

6.1 Acceptable development

This guide in Chapter discusses land use planning and flood zoning. The land use is a legal document that informs land use or development. However, assessment of proposals relates specifically to the assessment of any development that needs to be carried out in the planning area. All forms of development in flood affected land or flood prone areas require an approval. They include subdivisions, buildings and works. If building construction is proposed in a flood prone area or in a river floodplain, Building

Regulations apply. The consent of the relevant town and city council must be obtained. Before giving consent, the council approval committee must ensure that the proposed development is within acceptable land use for the various flood zones and buffer areas.

6.2 Flood Zones and Acceptable Land Use

A local Physical Development Plans includes an urban structure plan with a land use plan or outline zoning scheme or outline zoning plan for the whole of an urban area; Each outline zoning scheme zones land for particular uses, for example, residential, industrial, commercial, agriculture and institutional. Each zone has its own purpose and set of requirements. By introducing the flood zones within the **Floodplain and River Corridor Management Plan**, there is a need for guidance on acceptable land use for the various flood zones and buffer areas which can guide the assessment of proposals.

This Guide introduces requirements for specific types of development as shown in Table 6.2.4. The Guide informs the preparation and assessment of development proposals.

Table 6.2.4 provides a set of requirements and guidelines for particular development in a planning area. The land use plan and flood zones should be applied if a **Floodplain and River Corridor Management Plan** has been developed for a specific planning area and has been incorporated into the local Physical Development Plans. A development proposal must be consistent with **Floodplain and River Corridor Management Plan** prescriptions. Where Flood Zones with Flood Recurrence Interval in Years are not available, the developer needs to generate this information for all high flood risk areas. Table 6.2-1 shows flood zones and flood recurrence interval in years.

Table 6.2-1 Flood zones and flood recurrence interval in years

Flood size	Hydrological recurrence interval
Small	<1:2
Small – Medium	1:2- 1:20
Medium – Large	1:20 - 1:50
Large -Very Large	1:50 - 1:100
Very large	>1:100

Table 6.2-2 shows the shading key for requirements and conditions.

Table 6.2-2 Table Shading Key

Colour Coding	Description
Clear	Permitted
	Conditionally permitted
	Not permitted

Additional requirements as shown in Table 6.2-3 in addition to the meaning of the colour codes have been applied in Table 6.2-4.

Table 6.2-3 Additional Requirements Key

Code	Requirement
R1	A registered Engineering Professional must be engaged by the developer to satisfactorily demonstrate and certify that: ➤ The activity / development will not materially increase flood hazards for other property owners or adversely affect flood behavior or the stability of river channels. ➤ Any structure can withstand the forces and effects of flowing floodwaters, including scour of foundations, debris forces and buoyancy forces
R2	Floors above 1:100-year flood level. Basements (non-habitable purposes) to be flood-proofed to 1:50-year flood level.
R3	Floors above 1:50 year flood level
R4	A registered Environmental Professional (Aquatic Ecologist) must be engaged by the developer to determine the ecological buffer (if not available) and to satisfactorily demonstrate and certify that: • The activity / development will not negatively impact on the present condition of the river or wetland OR

	• The activity or development will improve the condition of the river or wetland from its present state
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Table 6.2-4 provides acceptable land use for the various flood zones, as well as specific requirements in instances where conditional approval is considered. The land use / development / activity must be set back beyond the greater of the applicable flood zone In Table 6.2-4. The effects of the 100-year recurrence interval storm event on all developments and infrastructure, including adjacent and downstream properties, must be evaluated to comply with the requirements in Table 6.2-4.

Table 6.2-4 Acceptable land use for the various flood zones

Land use /development/activity		Requirements and Conditions					
Category	Typical examples	Flood Zone (Flood Recurrence Interval in Years)					
		<1:2	1:2- 1:20	1:20- 1:50	1:50- 1:100	>1:100	<i>Explanatory Notes</i>
Industrial	Light, General, High Risk						
	Extractive (Mining)		R1	R1	R1		
Commercial	General				R2		
	Shopping Centres						
	Filling Stations						
Residential	Formal				R2		
	Informal						
Community & Public Facilities	Hospitals, Clinics and Health Centres						
	Prisons, Military						

	Barracks, Police Stations, Fire Stations						
	Cemeteries						
	Educational Facilities						
	Public Halls, Places of Worship						
Utility / Infrastructure Services (incl. Private)	Stormwater Management Facilities	R1	R1				
	Underground Sewers, Services						Manhole cover levels above 1:50 year flood level. Structure to be suitably protected and integrated into surrounds
	On Site Sewage Treatment						
	Water & Wastewater Works, Pump Stations						

	Solid Waste Disposal Sites						
	Power Generation, Electrical Substations						
	Telecommunication Exchanges & Transmitters.						
Environment, Open Space & Recreation	Nature reserves and National Parks						
	Sports Fields, Golf Courses, Picnic Areas		R1	R3			Urban agriculture to be conducted during specified period of the year as advised by the Ministry responsible for agricultural services.
	Public & Private Open Space						
Agriculture	Cultivation, Free-range		R1	R1			

	animal husbandry						
	Agricultural Processing / Industry				R1,R2		
	Feedlots and Piggeries			R1	R1		
Resorts	Hotels and Holiday Resorts				R2		
	Caravan and Camping Sites		R1				All ablution facilities to be located above the 20 year floodline
Transport Systems	Roads and Railways elevated above Normal Ground Level		R1	R1	R1		
	Bus Depots and Railway Stations						
	Parking Areas			R1			
Bank Protection	River training walls and dykes	R1	R1	R1			

Works, Flow Diversion Structures, & Earthworks	Dams, Weirs, Bridges	R1	R1	R1	R1	R1	Dam-break analysis to be performed where applicable
	Earthfill				R1	R1	In exceptional circumstances minor “smoothing” of the 50 / 100 year floodline may be considered, provided equivalent compensatory stage storage volume is provided within the development precinct

6.3 Development Approvals

A development approval as guided by town and city council byelaws and policies and requirements and conditions in Table 6.2-4 is needed for certain use or development to proceed on a parcel of land in a high flood risk area. Development includes the construction, alteration or demolition of a building or works and the subdivision or consolidation of land. The town and city council imposes conditions when granting development approvals and endorsing plans. The development proposal must satisfy all the conditions and requirements tied to its approval including land use and flood zoning requirements and conditions in this guide.

6.4 Objectives and assessment criteria

Table 6.4-1 shows assessment objectives and criteria

Table 6.4-1 Objectives and assessment criteria

Objective	Assessment Criteria
Protect human life and health, and provide safety from flood hazard	• Development should not be allowed on properties where the depth and flow of floodwaters would be hazardous to people or vehicles entering and leaving the properties. • Development and access should be located on land with the lowest overall hazard. • Buildings housing vulnerable people, community services facilities and emergency services should be sited outside the 100 year flood extent and, where possible, at levels above the height of the probable maximum flood.
Minimise flood damage to property and associated infrastructure	• Basements should be designed to be protected from flooding • Any building or portion of a building below the 100 year flood level

	should be constructed from flood-resistant materials
Protect and enhance the environmental features of rivers and floodplains	• Development should maintain or improve river and floodplain conditions • Development should allow access to maintain river corridors • Development should maintain or improve water quality. • Development should retain or improve significant visual aesthetics of landscapes within the river corridor

6.5 Composition and Roles of a Planning Committee

Planning is being done at local government level. Regulatory frameworks related to land use planning that are developed at national level need to be trickled down to the local government level. The Town and Country Planning Act (2014) establishes the appointment of Planning Committees. The Planning Committee may be a committee at a Local Authority or District Council. A Local Authority or a District Council's Planning Committee is required to administer the rules relating to building operations applicable within the area of the Local Authority or the District Council. The composition and procedure of a planning committee in the case of a City Council, Municipal Councilor/Town Council and district council is set out in Section 20 of the Physical Planning Act, 2016. All the rules and regulations that are formulated by the Planning Committee need to be harmonized with laws and regulations established by relevant ministries, departments and regulatory agencies. Regulatory frameworks and regulations by institutions such as MEPA, CIRA and NWRA need to be considered.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

A guide that will ensure that climate change is codified in land use planning and flood zoning in Malawi has been prepared. It has two major applications, namely informing the land use planning and zoning as well as the preparation and assessment of development proposals in flood prone areas. Lilongwe City and two selected districts of Karonga and Phalombe were used as case studies and scoping. The main aim is to inform land use planning and development in high flood risk areas, to protect the environmental integrity of aquatic resources and to ensure that permitted development enhances the aesthetics and character of the adjacent rivers / wetlands.

The overall approach in the development of the guide included a mixture of methods that included literature review, technical assessments, field investigations, structured observations and case studies. Stakeholder consultations focused on understanding institutional roles, regulatory mandates, and the extent to which climate change considerations were integrated into land use planning and flood zoning policies. These were complemented by key informant interviews.

This guide has been informed by outputs from three related studies, namely: climate risk assessments, flood risk assessments and a review of policy and regulatory frameworks (done concurrently with this work). Two case studies of international best practices have been drawn out and applied in coming up with the guide.

General guiding principles that should help in land use planning and flood zoning at town and local levels with regards to development restrictions and assessment of proposals have been highlighted. Guiding principles that should help in land use planning at town and local levels with regards to development restrictions and assessment of proposals in flood prone areas have been presented. Development proposal need to satisfy all the conditions and requirements that are tied to approval in high flood risk areas.

An operational framework for practical implementation of the ‘guidelines for climate-risk based land use planning and flood zoning’ has been provided in Appendix 3.

7.2 Recommendations

The following recommendations are made:

- Land use plans and flood zoning should be conducted for all high flood risk areas for which land use/development/activity is being proposed.
- Development proposals in high flood risk areas should be supported by detailed information about the land use/development/activity, proposed interventions and how they could impact on flood behavior, natural ecosystems and river morphology.
- Development approvals in high flood risk areas should only be granted if conditions and requirements of developing in flood prone areas as presented in this guide are met.
- There is a need for enhanced enforcement and political will to implement the prescriptions of this guide.

8 SELECTED REFERENCES

Government of Malawi (1995), The Constitution of the Republic of Malawi, Office of President and Cabinet

Government of Malawi (2013), Water Resources Act, Ministry of Agriculture, Irrigation and Water Development.

Government of Malawi (2014), Town and Country Planning Act, Chapter 23:01.
www.laws.africa

Government of Malawi (2016), Physical Planning Act, 2016, Act 17 of 2016.
www.laws.africa

Government of Malawi (2017), Environment Management Act, Ministry of Natural Resources, Energy and Mining.

9 APPENDICES

Appendix 1 List of stakeholders consulted

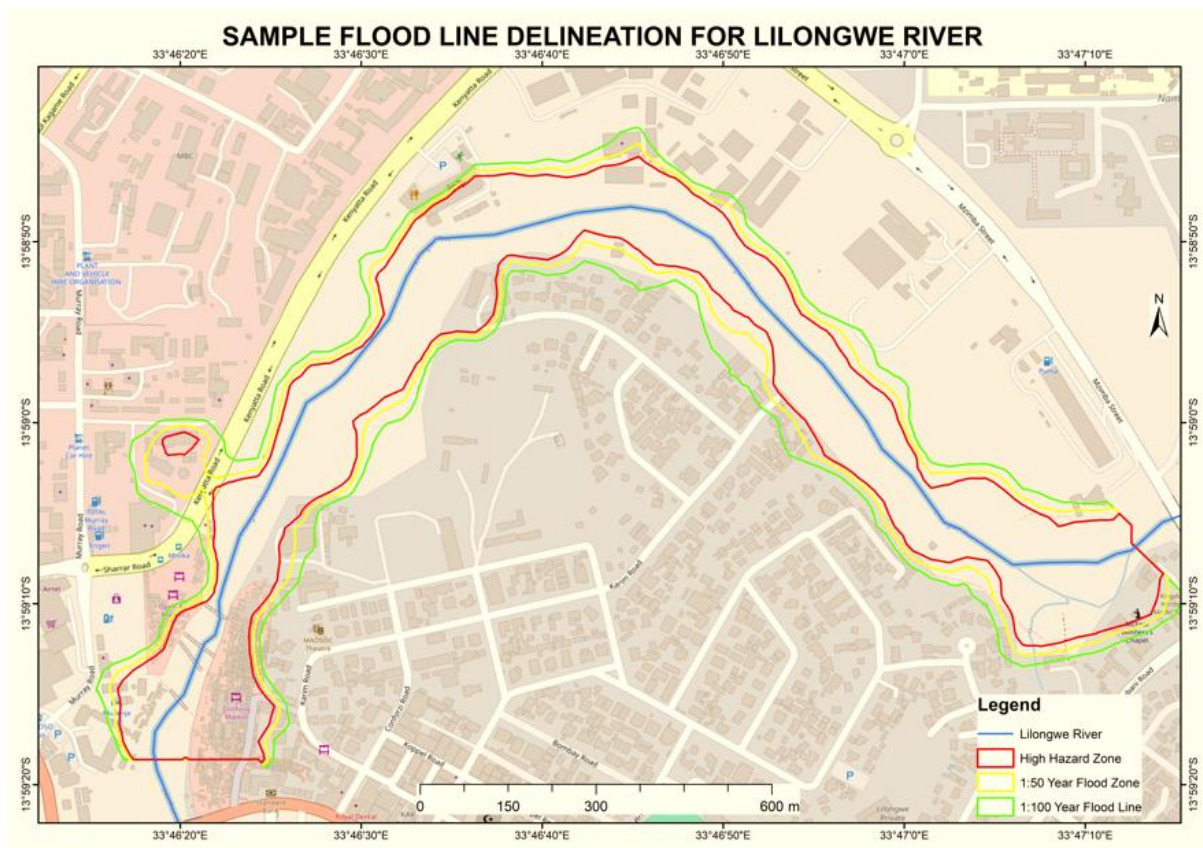
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ENVIRONMENTAL AFFAIRS DEPARTMENT
ATTENDANCE REGISTER: VALIDATION WORKSHOP ON GUIDELINES FOR LAND USE
PLANNING, FLOOD ZONING AND STANDARDS FOR BUILT ENVIRONMENT MEETING
HELD ON 23RD JULY 2026.

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CASE STUDY AREA: LILONGWE RIVER



Appendix 3 Operational Framework for the Guidelines for Climate-Risk Based Land Use Planning and Flood Zoning

Background: Climate risks need to be integrated into development planning, approval, permitting and implementation in Malawi through a Risk-Informed Development (RID) approach. Choices about land use and infrastructure development can either reduce disaster and climate risks or intensify them. Flood zones inform flood risks by ensuring that development decisions reduce risk rather than create new vulnerabilities. These guidelines for climate-risk based land use planning and flood zoning are aimed at informing appropriate land use planning and zoning as well as guiding the preparation and assessment of development proposals in flood prone areas. This Operational Framework is a practical blueprint/tool for applying the ‘guidelines for climate-risk based land use planning and flood zoning’ by City/District Councils and planning authorities (Planning Committee).

Key Terms:

“Development” -in relation to any land means any building, rebuilding, engineering or mining operations in, on, under or over land and any material change in the use of land or building;

“Development permission” -means permission granted under section 46 of the Physical Planning Act, 2016.

“Detailed Development Permission”. –a permission to carry out the development but not to commence construction until a Building Permit has been granted)

“Floodplain and River Corridor Management Plan” it a subject physical development plan that is concerned with flood risk management and outline flood zoning scheme within a town or city.

“Grant of Building Permit” –a permission to commence construction of a building for which detailed development permission has been granted.

“Outline Development permission” -a grant of approval in principle which will be followed in the event of permission being granted by submission of further detailed drawings.

Table A3 provides a description of the operational framework elements for the developed guidelines for climate-risk based land use planning and flood zoning

Table A3 Operational Framework

Operation Framework Element	Description
A. Reference Legislation	1. Physical Planning Act of 2016; Environmental Management Act of 2017; Water Resources Act of 2013; Town and Country Planning Act of 2014, and Disaster Risk Management Act of 2023
B. Use Context of the Operational Framework	1. Preparation of a local physical development plan 2. Application for Development Permission 3. Assessment of an Application for Development Permission
C. Stakeholders and their roles	1. Table 2.3-1 of the guidelines provides mandates and roles of the following stakeholders. i. Government Ministries, Departments Agencies and Regulators ii. Non State Actors iii. Consultants iv. Contractors
D. Preparation of a district and/or local physical development plan	1. Every local government authority is required to prepare a district physical development plan (in the case of a District Council) and/or local physical development plan (in the case of a City Council, Municipal Councillor Town Council) of the district (the whole or part of a district; more than one district; or parts of more than one district.) for which it is responsible and may comprise of a joint planning committee from two or more local government authorities. The purpose of a district physical development plan is to act as a general land use plan for the district in the form of maps and plans showing present and future land uses and development. 2. The following types of local physical development plans can be developed: (a) an urban structure plan, which shall be a land use plan for the whole of an urban area; (b) an urban layout plan, which shall be a detailed land use plan of a part of an urban area in which significant physical development is planned or likely to or has begun to take place or there is need for development or redevelopment or revision or upgrading (c) an urban civic plan, which shall be a more elaborate design of a special area or areas of an urban area showing layout of buildings, car parking lots and landscaping among other details. 3. Each type of district physical development plan or local physical development plan is required to have a subject specific physical development plan which shall be concerned with land use planning and flood zoning. It can be called “Floodplain and River Corridor Management Plan” and

	shall be concerned with flood risk management and outline flood zoning scheme within a given town or city. 4. The “Floodplain and River Corridor Management Plan” shall constitute part of the district or local physical development plan. 5. Considering that the local government authority may delegate the responsibility for the preparation of a district physical development plan to a registered physical planner in private practice, it can also delegate the responsibility for the preparation of a “Floodplain and River Corridor Management Plan” to registered physical planners and engineers in private practice. This subject land use and flood zoning physical development plan can either be prepared jointly or separately with the district/local physical development plan. 6. The preparation of the “Floodplain and River Corridor Management Plan” should be informed by Chapter 5 of the ‘guidelines for climate-risk based land use planning and flood zoning’ which outlines the <i>Guiding Principles On Land Use Planning</i>. The term "guiding" in this context refers to the directions that someone or an entity should take when undergoing through the process of coming up with land uses and flood zones. 7. Once the “Floodplain and River Corridor Management Plan” is prepared, it automatically becomes part of the district/local physical development plan. The approval of the district and local physical development plans by the Commission entails the approval of the “Floodplain and River Corridor Management Plan”. 8. As such, all programmes and projects for development within the district shall, as far as is practicable, be so formulated and prepared as to have regard to, and take into account, the “Floodplain and River Corridor Management Plan” which provides guidelines for climate-risk based land use planning and flood zoning. 9. The preparation of development proposals should be guided by Table 6.2.4 of the ‘guidelines for climate-risk based land use planning and flood zoning’ that provides a set of requirements and guidelines for particular development in a planning area. 10. All applications for development permission must be assessed with regard to, and take into account, the “Floodplain and River Corridor Management Plan”
E. Pre-application consultation	1. Every applicant is required to consult an authorised official prior to submitting an Application for Development Permission in terms of Section 46(1)(b) of the Physical

	Planning Act, 2016 in order to determine among other things the: (a) information which must be submitted with the application; (b) investigations which must be carried out; (c) further applications required in terms of any other relevant laws/Acts; (d) engineering services required and the need to liaise with other ministries, departments and agencies for services regarding engineering services; and (e) liaison required with other ministries, departments and agencies in order to align procedures for processing applications in terms of different legislation. 2. City/District Councils and planning authorities (Planning Committee) may prescribe requirements to determine whether an application requires pre-application consultation, the nature of the information that is required, the procedures to be followed and the time periods within which such meetings must take place. 3. An applicant may in writing request a pre-application consultation. 4. City/District Councils and planning authorities (Planning Committee) must keep a record of a pre-application consultation.
F. Information Required for Application for Development Permission	1. An Application for Development Permission must be accompanied by at least: (a) the prescribed application form completed in triplicate and signed by the applicant and owner, where the applicant is not the owner; (b) the following authority – 2. (i) if the applicant is not the owner of the land, a power of attorney signed by the owner and the owner's contact details; (ii) if the owner is a company, close corporation, trust, corporate organisation or an owners' association, proof that the applicant is authorised to act on behalf of the owner; (iii) if the owner is a close corporation or company proof that a close corporation or company has not been deregistered and is not in the process of being deregistered; (iv) if the owner is a trust, a copy of the Trust Deed; and (v) the consent of any mortgage bond holder, if any, in respect of an application prescribed by the Planning Committee; (vi) the name of the representative with whom, and the method by which, the City/District Councils and planning authorities will liaise and notify;

	(c) proof of payment of all fees in respect of the application; (d) if pre-consultation has taken place, the record of the pre-consultation proceedings; (e) a full copy of the title deed and if required by the Planning Committee, a conveyancer's certificate indicating that there are no restrictive conditions relating to the application;
G. Plans to be attached to an Application for Development Permission	1. All applications for Development Permission should contain all information as prescribed in Section E of this Operational Framework 2. An application for permission to develop land must be accompanied by three (3) sets of the plans and drawings associated therewith. To assist applicants in the preparation of such plans and drawings the appropriate standard requirements in respect of applications for particular types of development are as follows: 3. Type of Application – Outline Development Permission (a) a location plan, layout plan or similar plan depicting the proposed development in its cadastral context; (b) Site Plan (c) For areas within the City, a copy of the Surveyor-General's drawing of the subject property or extract from the approved general/master plan (d) Location plan in relation to the Floodplain and River Corridor Management Plan for the City or District; (e) Any other information required in the pre-application consultation. These could be ESIA, ESMP, Water abstraction rights, permits etc. 4. Type of Application – Detailed Development Permission (a) a location plan, layout plan or similar plan depicting the proposed development in its cadastral context; (b) Site Plan (c) For areas within the City, a copy of the Surveyor-General's drawing of the subject property or extract from the approved general/master plan; (d) Schematic design and conceptual designs. (e) For areas within the City, a copy of the Surveyor-General's drawing of the subject property or extract from the approved general/master plan (f) Location plan in relation to the Floodplain and River Corridor Management Plan for the City or District; (g) Any other information required in the pre-application consultation. These could be ESIA, ESMP, Water abstraction rights, permits etc.

	5. Type of Application – Grant of Building Permit (a) a location plan, layout plan or similar plan depicting the proposed development in its cadastral context; (b) Site Plan (c) Building plans (d) Detailed building plans including floor, elevation, section and elevation plans; and (h) For areas within the City, a copy of the Surveyor-General's drawing of the subject property or extract from the approved general/master plan (i) Location plan in relation to the Floodplain and River Corridor Management Plan for the City or District; (j) Any other information required in the pre-application consultation. These could be ESIA, ESMP, Water abstraction rights, permits etc. 6. In the case of an application for the subdivision of land, the subdivision plan showing the following: (i) location of the proposed land units; (ii) proposed zonings in respect of the proposed land units; (iii) public places; (iv) existing structures; (v) existing and proposed access points; (vi) servitudes; (vii) existing external engineering services; (viii) any significant natural features; (ix) street furniture; and (x) scale of the plan.
H. Assessment of applications for development permission and development restrictions	1. Assessment of applications for development permission in flood prone areas must be based on the land use planning and flood zoning codes that are classified into categories of 'high risk', 'medium risk' and 'low risk'. Some zones allow specific development but with restrictions or specific measures in place. 2. The "Floodplain and River Corridor Management Plan" is required to clearly demarcate 'high risk', 'medium risk' and 'low risk' based on delineated flood lines. The goal should be to protect people and property from current and future flood hazards. 3. All forms of development within and adjacent to flood affected land or flood prone areas should obtain an approval from the Planning Committee.

	4. Flood zones should be clearly indicated in the Floodplain and River Corridor Management Plan. 5. The assessment of development proposals and Applications for Development Permission should be guided by Table 6.2.4 of the 'guidelines for climate-risk based land use planning and flood zoning' that provides a set of requirements and guidelines for particular development in a given planning area in line with the Floodplain and River Corridor Management Plan. 6. A development approval shall be guided by town and city council byelaws and policies as well as assessment objectives and criteria set in Table 6.4-1 of the 'guidelines for climate-risk based land use planning and flood zoning'.
I. Decision-making after assessment of applications for development permission	1. A Local Authority or a District Council's Planning Committee is required to provide a decision after assessment of applications for development permission 2. The composition of a planning committee in the case of a City Council, Municipal Councillor/Town Council and district council must be as set out in Section 20 of the Physical Planning Act, 2016. 3. A Local Authority or a District Council's Planning Committee must administer the rules relating to building operations that are applicable within the area of the Local Authority or the District Council including the prescriptions of the Floodplain and River Corridor Management Plan. 4. All development approvals and non-approvals must be made by the Planning Committee that should advise the controlling officer to formally inform the applicant of the outcome.
J. Coordination among and within ministries, departments and agencies	1. All the rules and regulations that are applied by the Planning Committee in the assessment of applications for development permission need to be harmonized with laws and regulations established by relevant ministries, departments and regulatory agencies including regulatory frameworks and regulations set out by institutions such as MEPA, CIRA and NWRA. 2. Since the Planning Committee composition does not reflect the various ministries, departments and agencies; their requirements need to be submitted to the Planning Committee through any of the members or the Secretary of the Committee.
K. Enforcement of decisions in relation to development permission	1. The Planning Committee should provide enforcement mechanisms and measures in relation to development permission 2. All development should conform to the 'guidelines for climate-risk based land use planning and flood zoning' for it to be acceptable in Malawi.