

# Malawi National Adaptation Plan

*Malawi*

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# **Chapter 1**

## **1.1 Foreword**

## **1.2 Preface**

## **1.3 Acknowledgements**

## **1.4 List of Figures**

## **1.5 Acronyms and Abbreviations**

#####TABLE OR FORMAT#####

UNFCCC : United Nations Framework Convention on Climate Change NAP : National Adaptation Plan DEC : District Executive Committee LDC : Least Developed Country LEG : Least Developed Country Expert Group GCF : Global Climate Fund NAPA : National Adaptation Programme of Action VDC : Village Development Committee UNDP : United Nations Development Programme FAO : Food and Agriculture Organization GCF : Global Climate Finance SDGs : Sustainable Development Goals SIDS : Small Island Developing States MNRS : Malawi National Resilience Strategy COP : Conference of Parties UNFCC : United Nations Framework Convention on Climate Change EWGs : Expert Working Groups MoFEPD : Ministry of Finance, Economic Planning and Development DoDMA : Department of Disaster Management Affairs GVH : Group Village Headmen DESC : District Environmental Sub Committee NAIP : National Agriculture Investment Plan MNREM : Ministry of Natural Resources, Energy and Mining DC : District Commissioner NEP

## **1.6 Executive Summary**

# **Chapter 2**

## **Chapter 1 – Introduction**

### **2.1 The Need for National Adaptation Plan**

1. Climate change is a real development challenge causing unprecedented losses to economic gains achieved so far in least developed countries (LDCs) and the way forward is to integrate adaptation and development. The Global Climate Risk Index 2021 has shown that the effects of climate change are increasing and that intense and frequent extreme weather events are a major driver of disaster losses. The Risk Index places Malawi among the ten most affected countries in the world together with Mozambique and Zimbabwe . In addition to frequent and intense floods, Malawi has been experiencing reduced water availability, deteriorating water quality, reduced energy security and reduced agricultural productivity.
2. The Government of Malawi (GoM) has developed the national adaptation plan (NAP) to address medium- to long-term adaptation needs to achieve a twofold objective: (i) to reduce the country's vulnerability to climate change by building adaptive capacity and resilience, and (ii) to facilitate the integration of climate change adaptation into development planning at national, district and local levels. Both objectives are rationalized upon recognition that, numerous development policies in the country have embraced adaptation agenda but largely driven by sector specific needs and options – consequently missing synergistic opportunities and sustainability while raising questions about effectiveness of predominant approaches to adaptation at multiple levels . In addition, the country has been pursuing stand-alone, project-based approaches to adaptation planning which largely fail to incorporate iterative planning as a means to respond to the different timescales of climate change impacts.
3. The NAP process takes an innovative approach by embracing all other relevant national plans, sectoral strategies and programmes on adaptation

with a shared vision. By doing so, the NAP will function as a national policy instrument for coordinating and driving actions of all actors and stakeholders directed towards adaptation. Evolving through national policy documentary analysis and comprehensive engagement of all relevant sectors at the country level who worked in teams and committees for their technical input, the NAP achieves the much-needed relevance to national development needs. Thus, the NAP approach addresses the needs for adaptation, sustainable development and disaster risk reduction. All these themes span multiple sectors and scales, requiring action across a complex network of actors.

4. The NAP represents a living adaptation document based on summarized assessment of impacts, vulnerability and risk, and structured in a way to facilitate regular update to the assessments as new and additional information is collected. The NAP comprises adaptation priorities viewed from multiple lenses (such as climate hazards, sectors, administrative levels and scale), and essential adaptation policies, projects and programmes aligned with the Green Climate Fund (GCF) country programme in order to facilitate their implementation under the GCF. Its coherence and synergy with relevant issues at the national level facilitates reporting, monitoring and learning, nationally and internationally to the United Nation Framework Convention on Climate Change (UNFCCC). Through successive updates the NAP will be expanded as needed and serve a different purpose over time.

## 2.2 Coherence with National and Global Development

5. The NAP links with both national and global development agendas cherished in various policies, programmes and processes. In the national context, the NAP is aligned with both medium-term and long-term development strategies including the Malawi Growth and Development Strategy (MGDS 2017-2022), Malawi 2063 (MW2063), Malawi National Resilience Strategy (MNRS 2018- 2030), the National Agriculture Investment Plan (NAIP 2017/18-2022/23). However, these national policies address adaptation in silos of sectors. Implementation of sector-based strategies is often thwarted due to complex factors such as those discussed later and considered for action within the NAP framework.
6. The NAP coherently offers an integrated approach to adaptation with sustainable development and disaster risk reduction. Given the potential benefits of connectedness of adaptation, sustainable development and disaster risk reduction, further efforts have been undertaken to safeguard the nexus between the NAP and global initiatives such as the Sendai framework and Sustainable Development Goals (SDGs). There are no explicit

## **2.2. COHERENCE WITH NATIONAL AND GLOBAL DEVELOPMENT 9**

mentions of the SDGs or the Sendai Framework in the Paris Agreement, but the global goal on adaptation provides an umbrella for integrated actions when it calls for “enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change, with a view to contributing to sustainable development”.

7. The Sendai Framework makes clear reference to the challenges posed by climate change for disaster risk reduction while acknowledging the mandate of the UNFCCC as the primary oversight body for climate change policy. The Sendai Framework further highlights the role that climate change plays as a key driver of disaster risk, as well as the ability of adaptation and resilience-building to reduce disaster risk and achieve sustainable development. And, as with the Paris Agreement and the SDGs, the Sendai Framework specifically notes the importance of working with developing countries, in particular the LDCs, SIDS, landlocked developing countries and African countries, as well as with middle-income countries facing specific challenges.
8. A direct linkage exists between NAP and the SDG 13 on climate action which aims to “take urgent action to combat climate change and its impacts” and has the following specific targets, among others: (a) Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries; (b) Integrate climate change measures into national policies, strategies and planning; (c) Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning; (e) Promote mechanisms for raising capacity for effective climate change related planning and management in the LDCs and small island developing States (SIDS), including focusing on women, youth and local and marginalized communities. Not only SDG 13 that NAP is linked with in the context of SDGs, rather progress towards any of the SDGs is likely to increase resilience to climate change (as is the case with the SDGs on hunger, water, health, gender and ecosystems) or address some of the fundamental causes of climate change (captured in part by the SDGs on energy, infrastructure, cities, and consumption and production).

##. Methodological Approach 9. Preparation of the NAP followed the technical guidelines developed by the LEG. The guidelines contain a range of options for dealing with each element of the NAP based on principles guiding the process that was established building on the rich experiences of the LDCs in addressing adaptation through the National Adaptation Plan of Actions (NAPAs). The Malawi NAP process involves seven main approaches; a systems approach; horizontal and vertical integration; community-based participatory approach (CBPA); evidence-based approach; gender and human rights approach; and leveraging the private sector.

10. In line with the principles established by the United Nations Framework Convention on Climate Change (UNFCCC) and also in line with Malawi's development goals, the guiding principles for the NAP process are: sustainable development, uplifting the poor and the vulnerable, gender, participation and ownership, incorporating traditional and Indigenous knowledge, and financial accountability and integrity.
11. The development of this framework and the implementation of the NAP are linked to both national and international development strategies and goals such as the Malawi Growth and Development Strategy I, II and III, Vision 2020, the United Nations Sustainable Development Goals (SDGs), the Sendai Framework on Disaster Risk Reduction 2015–2030 and the 2063 Agenda of the African Union. It has also been guided by various national and regional development policies such as the National Environmental Policy (NEP), National Climate Change Management Policy (NCCMP) and the National Climate Change Investment Plan (NCCIP).

### **2.3 Structure of the Text**

12. The NAP consists of five chapters. Chapter 2 is a description of the methodological approach comprising the guiding principles, guidelines followed and how a systems approach to adaptation is employed to prepare the NAP. Chapter 3 establishes the national context within which the NAP is developed including the circumstances, institutional arrangements for climate change adaptation and the legal frameworks anchoring the NAP. In contrast Chapter 4, draws attention to some important challenges associated with integrated approaches to adaptation, sustainable development and disaster risk reduction, and presents several options to overcome those challenges and support enhanced adaptation action, looking at the role of NAPs in particular.

# **Chapter 3**

## **Chapter 2 – National Contexts**

### **3.1 Overview**

13. The preceding chapter has highlighted the methodological approach employed in the preparation of the NAP and Chapter 3 provides a situation analysis at country level. The focus of the analyses is on the geographical, socio-economic, policy and institutional issues which the NAP is prepared to address. The national contexts provides the basis for strategic goals, objection and actions with priority adaptation options presented the subsequent chapter.

### **3.2 Geographical Context**

14. Geographically located in Southern Africa, Malawi is landlocked, bordering with Mozambique, Zambia and Tanzania (Figure 1). The country has an estimated population of 18.6 million (2019), which is expected to double by 2038. With The country has a total area of 118,484 km<sup>2</sup> of which 20% is covered by Lake Malawi. It has a total population of about 18 million people with a growth rate of 3.06%. Malawi continues to enjoy a stable and democratic government.
15. The country's topography is heterogenous with mountainous landscapes surrounding the Rift Valley, plateaus rising generally 800m to 1,200m above sea level, although some rise as high as 3,000m in the north. To the south of Lake Malawi lies the Shire Highlands, approximately 900m



Figure 3.1: Figure 1 – South-east Africa showing the location of Malawi

above sea level. The climate is tropical, but the influence of its high elevation means that temperatures are relatively cool. The warm-wet season stretches from November to April, during which 95% of the annual precipitation takes place.

16. Much of the land surface of Malawi is a large plateau that is between 3,000 to 4,000 feet above sea level (Fig. 2). Elevations rise over 8,000 feet in the Nyika Plateau in the north with the plateau dominating the west of the country and dropping down to the Great African Rift and Shire valleys in the east and south. In the south-eastern regions of Mt. Mulanje elevation is about 10,000 feet, and at Mt. Zomba 7,000 feet. The Shire highlands in the south are the lowest area in the country with elevations extending from 2,000 to 3,000 feet.
17. Climate-related vulnerability is primarily a function of landscape stabilizing factors which is directly related to topography. The types of vulnerabilities are thus affected by the landform, in that a flat area would suffer different problems compared with an area with steep slopes and high mountains. The topography of Malawi is such that there are highlands, escarpments and plains, all having different problems (e.g. short-term strong water flows with low debris contents, torrential flows with high debris contents and slow moving or standing water with low debris contents over longer periods respectively), and requiring different solutions as discussed in the guidelines in climate adaptations.



Figure 3.2: Figure 2 – Variation in Topography of Malawi that influences climatic heterogeneity.

##. General Climate – Temperature and Precipitation 18. Overall, the country experiences three seasons: a cool season (May to mid-August), a hot season (mid-August to November), and a rainy season (November to April), with rains continuing longer in the northern and eastern mountains. Mean temperatures . In general mean temperatures range between 18°C and 26°C (Fig. 1). A cool, dry winter season runs from May to August with mean daytime temperatures varying between 17 and 27°C, and temperatures falling between 4 and 10°C at night. A hot, dry season lasts from September to October with daytime temperatures between 25 and 37°C .

### 3.2.1 National

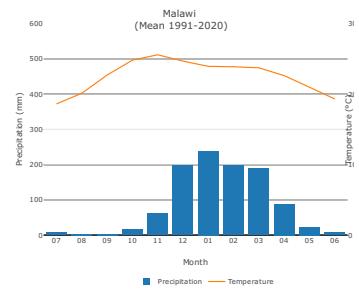
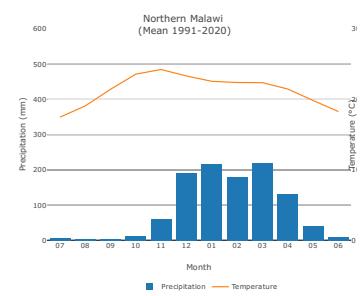
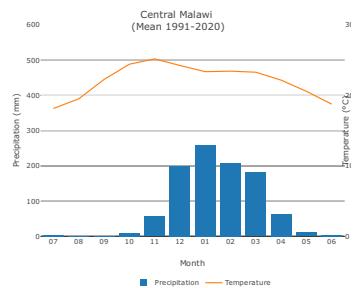


Figure 3 – Monthly Climatology of Mean-Temperature & Precipitation 1991-2020 Malawi.

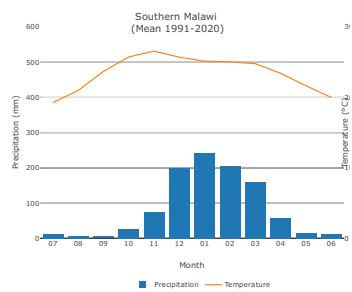
### 3.2.2 North



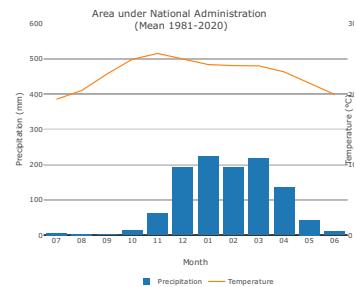
### 3.2.3 Central



### 3.2.4 South



### 3.2.5 Area under National Administration



19. Malawi experiences large heterogeneity in rainfall regime, and there are big differences between the North, Central and South regions. Annual average rainfall varies from 725mm to 2,500mm with Lilongwe having an average of 900mm, Blantyre 1,127mm, Mzuzu 1,289mm and Zomba 1,433mm (Fig. 4).
20. Rainfall patterns are heaviest along the coast of Lake Malawi where precipitation is heaviest (averaging 1600 mm annually); the rest of the country's rainfall ranges between 750 and 1000 mm annually. Overall, the country experiences three seasons: a cool season (May to mid-August), a hot season (mid-August to November), and a rainy season (November to April), with rains continuing longer in the northern and eastern mountains (Fig. 4).

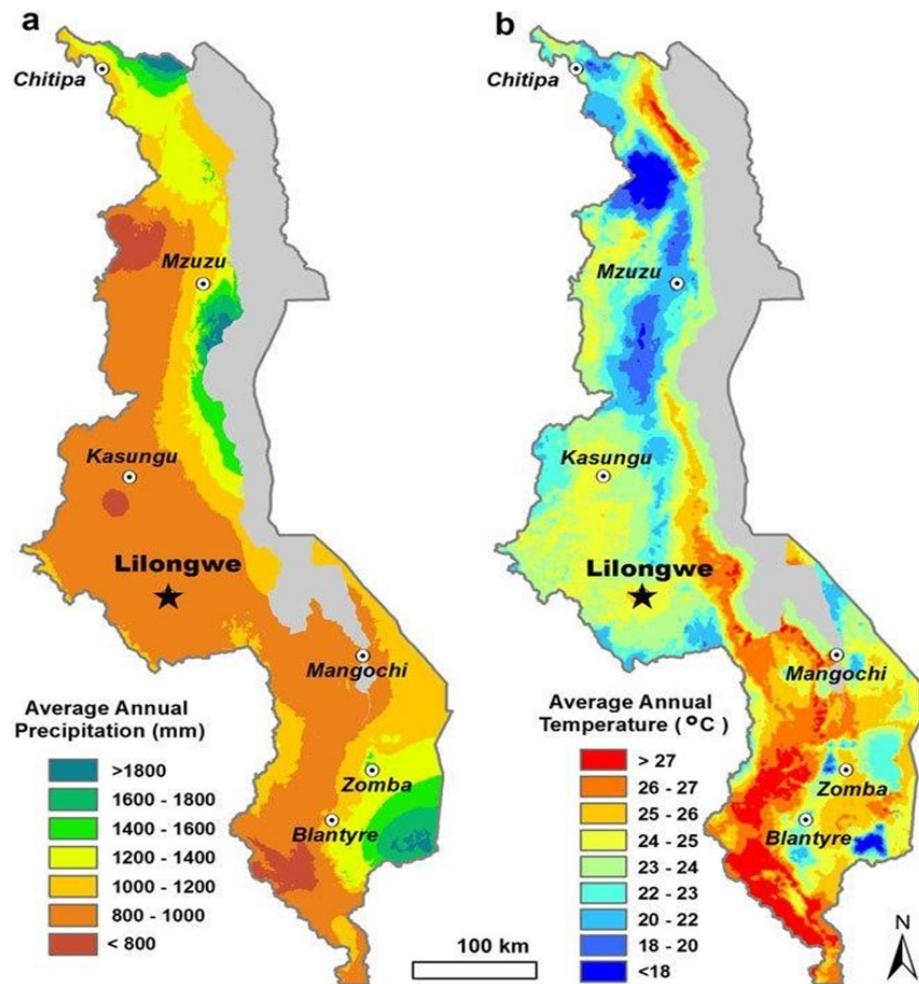


Figure 3.3: Figure 4 – Mean annual rainfall and temperature maps of Malawi

### 3.3 Socio-economic Context

21. Malawi's is relatively a peaceful country although its development agendas face multi-pronged challenges including poverty, malnutrition and food insecurity, low literacy rate, vulnerability to external shocks such as weather and health, environmental degradation and loss of biodiversity and energy insecurity. The country remains one of the poorest in the world despite making significant economic and structural reforms to sustain economic growth. The economy is heavily dependent on agriculture, employing nearly 80% of the population, and it is vulnerable to external shocks, particularly climatic shocks. However, poverty and inequality remain stubbornly high. The latest poverty figures show the national poverty rate increased slightly from 50.7% in 2010 to 51.5% in 2016, but extreme national poverty decreased from 24.5% in 2010/11 to 20.1 percent in 2016/17. Poverty is driven by low productivity in the agriculture sector, limited opportunities in non-farm activities, volatile economic growth, rapid population growth, and limited coverage of safety net programs and targeting challenges.
22. Real GDP growth is projected to grow at 3.3% in 2021 and 6.2% in 2022. The prospect for a recovery to the pre-pandemic level is not expected until 2022, mainly because of the uncertain effect of COVID-19 infections. The projected growth will be driven by recovery in the tourism and agriculture sectors, exports and public investments in infrastructure (airport, roads, energy). The downside risks to the projected recovery relate to a potential second wave of COVID-19 infections, bad weather, and fiscal overruns due to revenue underperformance. The fiscal deficit is projected to widen to 10.2% in 2021, raising the debt-to-GDP ratio to 66% in 2021. The current account deficit is forecast to narrow to 12.5% of GDP in 2021 as exports rebound, then tick up to 12.9% in 2022. A rebound in domestic economic activity and a projected increase in oil prices may have pushed inflation from 8.8% in 2019 to an estimated 9% in 2020, but improved food production should help bring it down to 7.8% in 2022.

### 3.4 The governmental, institutional and political contexts

23. Analysis of the country's political economy can provide a valuable approach to address the variety of adaptation opportunities and challenges involved in mainstreaming the adaptation options into existing policy, planning and budgetary processes. Within the political economy policy-making requires the combination of many policy interventions and does not rely on a 'silver bullet' or blanket solutions.

### 3.4. THE GOVERNMENTAL, INSTITUTIONAL AND POLITICAL CONTEXTS21

24. To begin with, climate change planning in the country was initially driven by adhoc institutional arrangements – such as technical working groups and steering committees – to develop and coordinate climate change through the NAPA. In recent years, such arrangements have been institutionalised, allowing for a more programmatic approach at all levels. The NAP process will have to operate within these institutional contexts.

#### *National Level Structure*

25. The GoM established a clear institutional framework for climate change coordination at national level. The NAP will have to be implemented in accordance with this institutional structure (Figure 2).

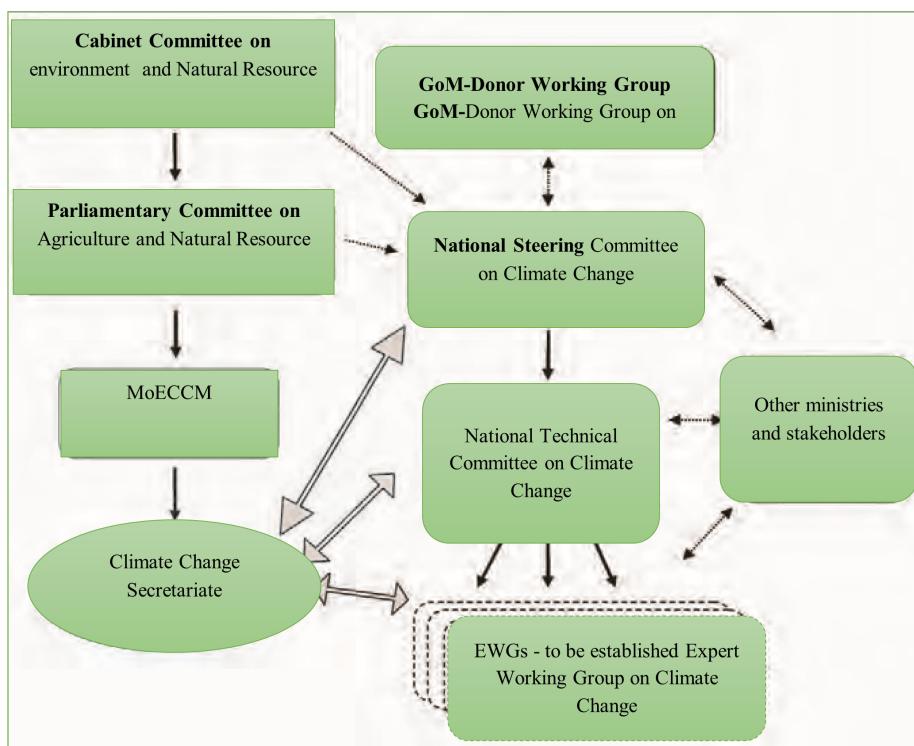


Figure 3.4: Figure 5 – Institutional arrangement for climate change management in Malawi (Source: Malawi Climate Change Management Policy, 2016).

26. The country does not need to create a totally new institutional arrangement for implementation of the NISSAP. The Ministry of Forestry Natural Resources leads on climate change policy development in Malawi This is. exercised through the Environmental Affairs Department (EAD) that

is responsible for coordinating national and international climate change related issue . The Department of Climate Change and Meteorological Services (DCCMS) collaborates with EAD to coordinate national and international climate change issues. EAD also coordinates closely on climate ministries and stakeholders change with the Ministry of Agriculture, Irrigation and Other ministries and stakeholders Water Development (MAIWD), Ministry of Local Government (MoLG) and Ministry of Finance, Economic Planning and Development (MoFEPD). The Department of Disaster Management Affairs' (DoDMA) coordinates the implementation of Disaster Risk Management (DRM) at national level and is responsible for preparedness and response to weather and climate related disasters such as droughts and floods. DoDMA is also drafting a National Resilience Strategy which will include climate resilience.

27. In 2009 the Ministry of Economic Planning and Development was given the mandate to coordinate climate change activities under the National Climate Change Programme (NCCP). The United Nations Development Programme (UNDP), Food and Agriculture Organisation of the United Nations (FAO), and the World Food Programme (WFP) then supported the NCCP. National Climate Change Technical and Steering Committees largely supported and directed activities of the NCCP.
28. **District and Local Level Structures:** Rationale for focusing adaptation at district level roots in recognition that, the district represents the level where participation and empowerment of vulnerable individuals and communities is most feasible and is the level where opportunities for collective action and accountability ensue. Key stakeholders are also better able to interface with each other, and, more importantly, with the communities they serve. It is at this level that adaptation outcomes and impact can be measured directly. In this respect the role of local governments facilitate the integration of adaptation innovation and in creating a supportive environment for implementation of NAP at grassroot level.
29. There are policy opportunities at district level to integrate adaptation to climate change but requires capacity building. The Government of Malawi adopted a Decentralization Policy in 1996 to devolve authority for managing development projects and programmes at district level. The District Council is the focal point for district level policy and programme development, implementation, monitoring and evaluation. All projects at District level are overseen by the District Council for strategic direction, inter-sectoral coordination and policy guidance, overseeing of implementation of policy decisions, endorsement of consolidated annual work plans and budgets, and monitoring of progress. The District Executive Committee (DEC), headed by the District Commissioner (DC), provide overall leadership of the at the district level. The DEC is composed of technical staff from Government Departments, civil society organizations and other stakeholders. The DEC provides technical direction in the management

### **3.4. THE GOVERNMENTAL, INSTITUTIONAL AND POLITICAL CONTEXTS23**

of NAP and projects. It is directly responsible for facilitating formulation and implementation of the District Development Plans. Under the NAP, each DEC has sub-committees for the key sectors including the District Environmental Sub Committee (DESC) which is responsible for issues of environmental management, CC, forestry and other natural resources. The secretariat to the DESC is in the Directorate of Planning & Development that is able to ensure that CC issues are mainstreamed throughout the District's programmes. The DESC are responsible for preparing consolidated Annual Work Plans and Budgets for review and approval by the DEC and in turn by the District Council. It will also be responsible for conducting physical progress and policy reviews in addition to facilitating the formulation of new policies. Implementation of NAP projects and programmes at area level will be channelled through the Area Development Committee (ADC) headed by the Traditional Authority. At village level, it will be through the Village Development Committee (VDC) headed by the Group Village Headmen (GVH). In cases where sector specific committees for particular projects exist, implementation of the projects will be done by the ADC and VDC in collaboration with the committee. Communities overseen by the GVH will not only be responsible for implementation of the NAP projects.

30. Implementation of the NAP has various entry points for mainstreaming at different planning levels most especially within the district development planning system (DDPS). Important characteristics of the DDPS which makes it flexible to mainstreaming climate change include:
  - District-focused: All the planning, implementation and management of development activities is done within the district and by district structures. Hence, the district is empowered to facilitate and decide its own development process depending on needs.
  - People-centered: The DDPS considers building capacity of individuals and their communities/institutions an important undertaking.
  - Bottom-up: The District Development Planning System recognizes that local communities should not be told what to do but should formulate their own development agenda. Outsiders are just facilitators of the process, to strengthen the local capacities.
  - Community Participation: The DDPS ensures that the planning and management of the development process benefits from representation, input and decision-making of the local communities.

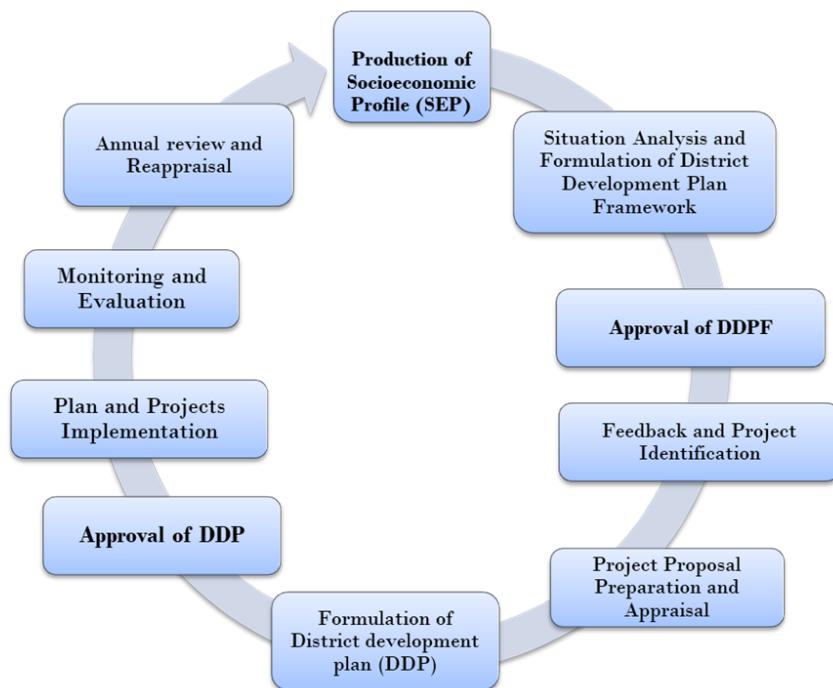


Figure 3.5: Figure 6 – The District Development Planning System. For each of the components of the DDPS, consideration for mainstreaming climate change adaptation is feasible.

### 3.5 Challenges for institutional coordination

31. Coordination between government agencies has been repeatedly cited as a challenge. For example, the Department of Disaster Management Affairs (DoDMA), the National Disaster Preparedness and Relief Committee (NDPRC) and the National Disaster Preparedness and Relief Fund all have responsibility for disaster risk management, which includes climate related hazards. This can make it unclear on where responsibility for climate variability ends and responsibility for climate change starts. This can make it difficult, especially for external agencies and development partners, to know which government institution or agency is best placed to coordinate NAP activities. Any lack of consensus on which GoM department is best placed to coordinate climate change issues runs the risk of negatively affecting relationships of NAP related sectors. The role of Government ministries, departments and agencies is to provide policy direction and strategic direction in the particular sector of interest. Their roles also include sector-specific policy formulation, coordination of the thematic activities; monitoring, reporting and verification of project activities, capacity building across ministries and departments and tailored to the challenges encountered in the respective projects, and resource mobilisation<sup>77</sup>.
32. The GoM's National Steering Committee on Climate Change (NSCCC) will provide strategic guidance and direction for the SPCR. The NSCCC is chaired by the Secretary to the Treasury and supported by a National Technical Committee on Climate Change (NTCCC) and a Climate Change Secretariat housed in the Environmental Affairs Department (EAD). The two primary ministries responsible for the implementation of the SPCR will be the Ministry of Finance, Economic Development and Planning, and the Ministry of Environment and Climate Change. Implementation of the projects will be through the relevant sector ministries and departments
33. The private sector has multiple relevance with regards to climate resilience although in Malawi they are seldom actively engaged to take an active role. Experience has shown that the private is affected by climate change when business operations and livelihoods are under threat. At the same time, the private sector can increase vulnerability to climate impacts through unrelated activities that add stress to resources. For example, the tobacco industry has been a culprit in exacerbating deforestation. Lastly, the private sector can provide technical, financial and social solutions to cope with the impacts of climate change.

### 3.6 Legal frameworks

34. **The Constitution of the Republic of Malawi (1995):** Environmental values have been enshrined within the Constitution of the Republic of Malawi. Chapter III; section 13 (d) of the Malawi's constitution adopted in May 1995 stipulates four principles and objectives for managing the environment responsibly. They include: (i) prevent the degradation of the environment (ii) provide a healthy living and working environment for the people of Malawi (iii) accord full recognition of the rights of future generations by means of environmental protection, and (iv) conserve and enhance the biological diversity of Malawi.
35. **National Environmental Policy (1996):** The NEP was developed to guide all stakeholders in integrating environmental issues into the national socioeconomic development policies, programmes and plans. The objectives of the policy include: Promotion of efficient utilization and management of natural resources; Facilitation of rehabilitation and management of essential ecosystems and ecological processes; Enhancement of public awareness on the importance of sound environmental management; and Promotion of cooperation between Government, local communities, Civil Society Organizations and private sector in the management and sustainable utilization of natural resources and the environment. The policy also calls for the institution responsible for environmental affairs to play a facilitating, coordinating and advisory role on all environmental issues. The mandate of the policy is derived from section 13d of the National Constitution. The policy is also guided by several international conventions and treaties to which Malawi is a signatory.
36. **Environmental Management Act (1996):** The EMA provides a legal framework for the protection and management of the environment, conservation and sustainable utilization of natural resources. It identifies responsibilities of different stakeholders and calls for the establishment of bodies for coordination of environmental issues. The Act also calls for specific measures to deal with environmental issues such as the need for; Environmental Impact Assessment (EIA) for all development projects; District Environmental Action Plans; and the establishment of the Environmental Fund. Sectoral legislations such as the Forest Act, the Fisheries Act etc. carry specific details of a particular sector but they are required to conform to EMA. The EMA has been reviewed to take into consideration changing situations and provisions of the sector specific policies and legislations.
37. **The Forestry Act (1997):** This act replaces the one dating back to 1942 which was narrow in scope and focused on control of resources. The newer legislation embodies the spirit and intent of the National Forest Policy and it aims at protecting the rights of people who grow trees in order for them to benefit fully from their investment. Among other clauses,

it contains provisions for the management of indigenous forests on customary and private land; the management of reserves and protected areas; and the establishment and maintenance of woodlots and plantations. It also provides the legal framework for sustainable utilization of customary land forests/trees with particular emphasis on the formation of local institutions (Village Forest Committees) aimed at promoting organized participatory effort in forest/tree management at the grass roots level.

38. **National Forest Policy (1996):** The National Forest Policy of 1996 represents a significant departure from previous strategies which favoured forest protection rather than sustainable utilization of forest resources. The goal of the policy is to sustain the contribution of the national forest resources to the quality of life in the country by conserving the forestry resources for the benefit of the nation. The objective of the policy is to improve the quality of life of the Malawi population, particularly rural smallholders, and provide a stable local economy in order to reduce the degenerative impact of development on the environment that often accompanies poverty. The forest policy provides an enabling environment for making forests and tree resources available to communities on a sustainable basis thereby promoting rural development. It also provides better guidance on the roles and responsibilities of government, the private sector and rural communities in the utilization and management of forests and the linkages with other sectors and land uses. In 2003 the Forest Policy was revised in order to expand on aspects of community based forest management, including access to resources, benefit sharing, the role of traditional leaders and decentralization.
39. **National Fisheries and Aquaculture Policy (1999):** The National Fisheries and Aquaculture policy provides clear guidelines for the development of the fisheries sector. The fisheries sector plays a significant economic and nutritional role to the Malawi's population. The sector contributes 4% towards the Gross Domestic Product (Malawi Fisheries Department, 1998) and is an important source of employment, rural income, food security and import substitution. Lake Malawi is the largest inland water body and also the most important in terms of fish production, navigation and tourism in Malawi. The policy also stipulates roles and responsibilities of public and private sector and civil society organisations in the development of the fisheries industry.
40. **Fisheries Conservation and Management Act (1997):** Fisheries Conservation and Management Act 1997 is a legal instrument that provides for the regulation, conservation and management of the fisheries of Malawi. The Fisheries Advisory Board, comprising stakeholders from a wide range of Government, quasi Government agencies, as well as the private sector, has been established and is entrusted with the function of advising the Minister on the development, conservation and management of the fisheries. The major achievement of the Fisheries Conservation

and Management Act is the inclusion of local community participation in the management of the fisheries by acknowledging co-management as a legal option. This was formalized by the inclusion of subsidiary legislations such as the Beach Village Committees (BVCs) by-laws in the fisheries legislation signaling Government's commitment to empowering local communities. The Fisheries Department has been instrumental in devolving power to the fishing community in the management of the fishery resources for sustainable agriculture and irrigation, fisheries, navigation, eco-tourism, forestry, hydropower and disaster management and environmental protection. The policy also promotes international cooperation in the management of trans-boundary waters without compromising the country's sovereignty, security and territorial integrity; Facilitate conformity with regional and international agreements and protocols on shared water resources, catchment protection and management, and water resources monitoring; Promote coordination as a Ministry responsible for water issues with other stakeholders in the water and natural resource management sector; and Involve the private sector in both management of water resources and service delivery. Notable inclusion in the new policy is the decentralization of water resource management to basin level for the establishment of commercially oriented government owned regional river basin authorities.

41. **National Water Policy (2005):** The Water Resources Management Policy and strategies were developed in 1994. These were later revised to ensure that water resources management issues are adequately harmonized to make maximum contribution of water to the economic, social and environmental advancement and prosperity of the country. The new Water Policy aims to mainstream issues of water resource management, water quality and water utilization into national development. The objectives of the policy are to: Promote sustainable and integrated water resource management and development to make water readily available and equitably accessible by all Malawians; Ensure water of acceptable quality for all needs; Provide water supply and sanitation services to all at affordable cost; resources for sustainable agriculture and irrigation, fisheries, navigation, eco-tourism, forestry, hydropower and disaster management and environmental protection. The policy also promotes international cooperation in the management of trans-boundary waters without compromising the country's sovereignty, security and territorial integrity; Facilitate conformity with regional and international agreements and protocols on shared water resources, catchment protection and management, and water resources monitoring; Promote coordination as a Ministry responsible for water issues with other stakeholders in the water and natural resource management sector; and Involve the private sector in both management of water resources and service delivery. Notable inclusion in the new policy is the decentralization of water resource management to basin level for the establishment of commercially oriented government owned regional river

basin authorities.

42. **National Land Policy (2002):** Since independence, the GoM operated without a comprehensive land policy until 2002 when the National Land Policy was developed. The National Land Policy is the key instrument for dealing with all land issues. The goal of the policy is to ensure tenure security and equitable access to land by all citizens of Malawi in order to facilitate ecologically balanced use of land resources. The policy deals with issues of access to land, tenure security and sustainable environmental management. The key focus of the policy is on issues of land ownership, land use, land registration, national physical development plans, and establishing legal framework for land use. Other land sector policy reforms enacted since 1994 to encourage agriculture, forestry, tourism, mining and natural resource management and habitat preservation are also recognized and affirmed by this policy. The land legislation has been prepared and submitted to the cabinet for approval.
43. **National irrigation Policy (2000):** The irrigation services are guided by the National Irrigation Policy of 2000. Key objectives include: Increasing irrigated agricultural production and enhancing food security; Increasing incomes from irrigated agriculture and other income generating activities and increasing commercialization in irrigated agriculture both at smallholder and estate levels; and Creating an enabling environment for irrigated agriculture by facilitating and encouraging the private sector to invest in irrigation development and encourage rural communities to manage irrigation projects in order to fully utilize irrigable land in Malawi. The policy includes provisions for undertaking Environmental Impact Assessment (EIA) for all medium and large-scale irrigation development programmes and projects to ensure that any detrimental environmental impacts associated with irrigated agriculture are avoided or minimized. Apart from the provision on the EIA, the irrigation policy does not fully highlight key environmental sustainability issues and measures which should be considered in the planning of irrigation development.
44. **Irrigation Act (2001):** The Irrigation Act No 16 of 2001 makes provisions for the sustainable development and management of irrigation, protection of the environment from irrigation related degradations, and establishment of the national irrigation board.
45. **National Land Resources Management Policy and Strategy (2000):** The overall goal of the policy is to promote diversified and sustainable use of land-based resources both for agriculture and for other uses in order to avoid sectoral land use conflicts and ensure sustainable socio-economic development. The issues of environment are well enshrined in this policy. Specifically the policy seeks to: improve and sustain the productivity of land for agricultural and other uses through use of sound technologies to conserve soil and water resources,

soil fertility improvements and respecting livestock stocking capacities of land; Promote rehabilitation of degraded lands for both agriculture and other uses with the aim of sustaining the usability of these lands; and Control the dangers of surface run-off water such as soil erosion and all its associated causative factors. The policy also promotes community awareness and understanding of the importance of sustainable utilization of land resources; Supports the development of economically and ecologically sound, and socially acceptable land management technologies; Protects and preserves ecologically sensitive areas such as steep slopes, stream banks, water-shed areas and dambos; Puts in place waste disposal measures deemed appropriate to minimize land pollution; and Promotes natural resources management, conservation and controlled utilization in order to ensure sustainable productivity of land and ecosystems. The policy also pays particular attention to the issue of bringing on board all key stakeholders at both policy formulation and implementation in order to ensure its success.

46. **National Wildlife Policy (2000):** The wildlife policy 2000 is part of government's land use plan and is aligned to the National Environmental Policy as well as related policies such as lands, agriculture, forestry, fisheries, water and tourism. The goal of this policy is to ensure proper conservation and management of wildlife resources. The policy also increases sustainable utilization and equitable access to the resources and fair sharing of the benefits from the resources for both present and future generations of Malawi. The policy embraces the following objectives: Ensure adequate protection of representative ecosystems and their biological diversity by promoting and adopting appropriate land management practices that are in line with sustainable utilization considerations; Create public awareness and understanding on the need for wildlife conservation and management and also their relationship to other land use issues; Create a conducive environment for wildlife-based enterprises; Facilitate development of necessary legislation and enforcement mechanisms in order to eliminate illegal wildlife use; and Develop a cost effective legal, administrative and institutional framework for managing wildlife resources without compromising the resources' ecological attributes.
47. **National Energy Policy (2003):** The government places energy supply as one of the priority sectors in the Malawi Growth and Development Strategy (MGDS II). The MGDS is a nationally owned, result-oriented, medium term framework inspired by Vision 2020 and the lessons learnt from the Malawi Poverty Reduction Strategy Paper. The MGDS II defines its long-term goal in energy generation and supply as to generate sufficient amount of energy to meet economic and social demands. The objectives of the Energy policy 2003 are to improve the security and reliability of energy supply; Increase access to affordable and modern technologies; Stimulate economic development and rural transformation for poverty reduction; Improve the energy sector and governance; and mitigate environmental,

safety and health impacts of energy production and utilization. One of the policy goals is to reduce dependence on biomass energy from 93% in 2003 to 50%<sup>1}</sup> in 2020 with the other 50% of energy coming from modern energy sources. Consequently, the government is implementing programmes designed to promote the use of alternative sources of energy other than biomass fuel, and adoption of renewable energy technologies so as to reduce environmental degradation.

48. **Decentralization Policy (1998):** The decentralization policy provides an enabling environment for strengthening the enforcement machinery and decentralizing natural resources and environmental management and governance, among others. The policy puts districts in charge of planning and managing local development. As such, districts are an important entry point for integrating climate change, natural resources and environmental management into broader goals and strategies. Despite all these policies and acts being in place, we do not have effective implementation.



## **Chapter 4**

# **Chapter 3 – Vulnerability And Adaptation Options**

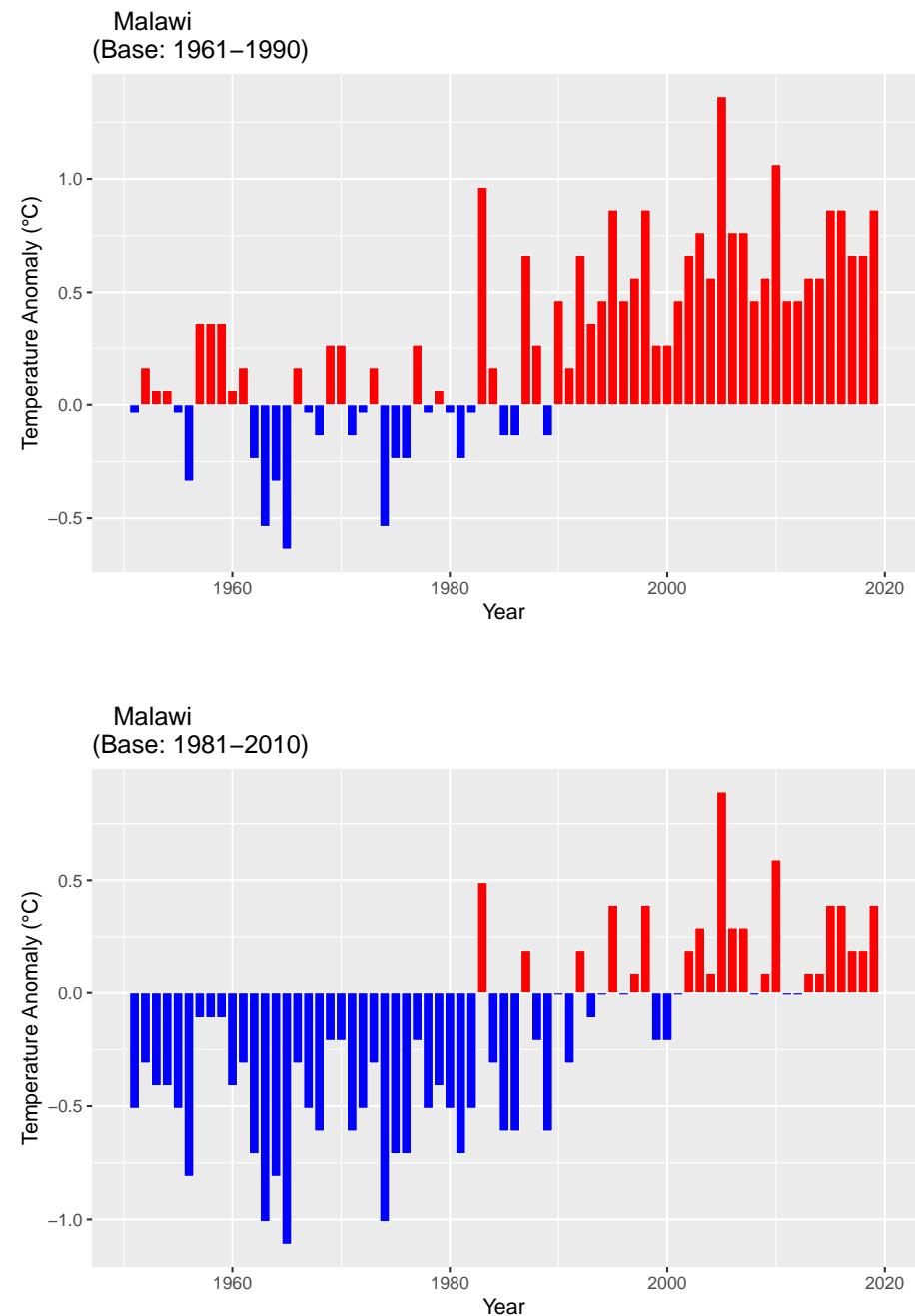
49. This chapter provides a comprehensive vulnerability assessment of the country to the impacts of climate change and draws short – to long-term implications for national adaptation planning. The vulnerability assessment employs a systems approach by combining analyses from different sector vulnerability assessment to examine the nexus between and among the different sectors.

### **4.1 Malawi’s Historical Trends And Projected Future Climate**

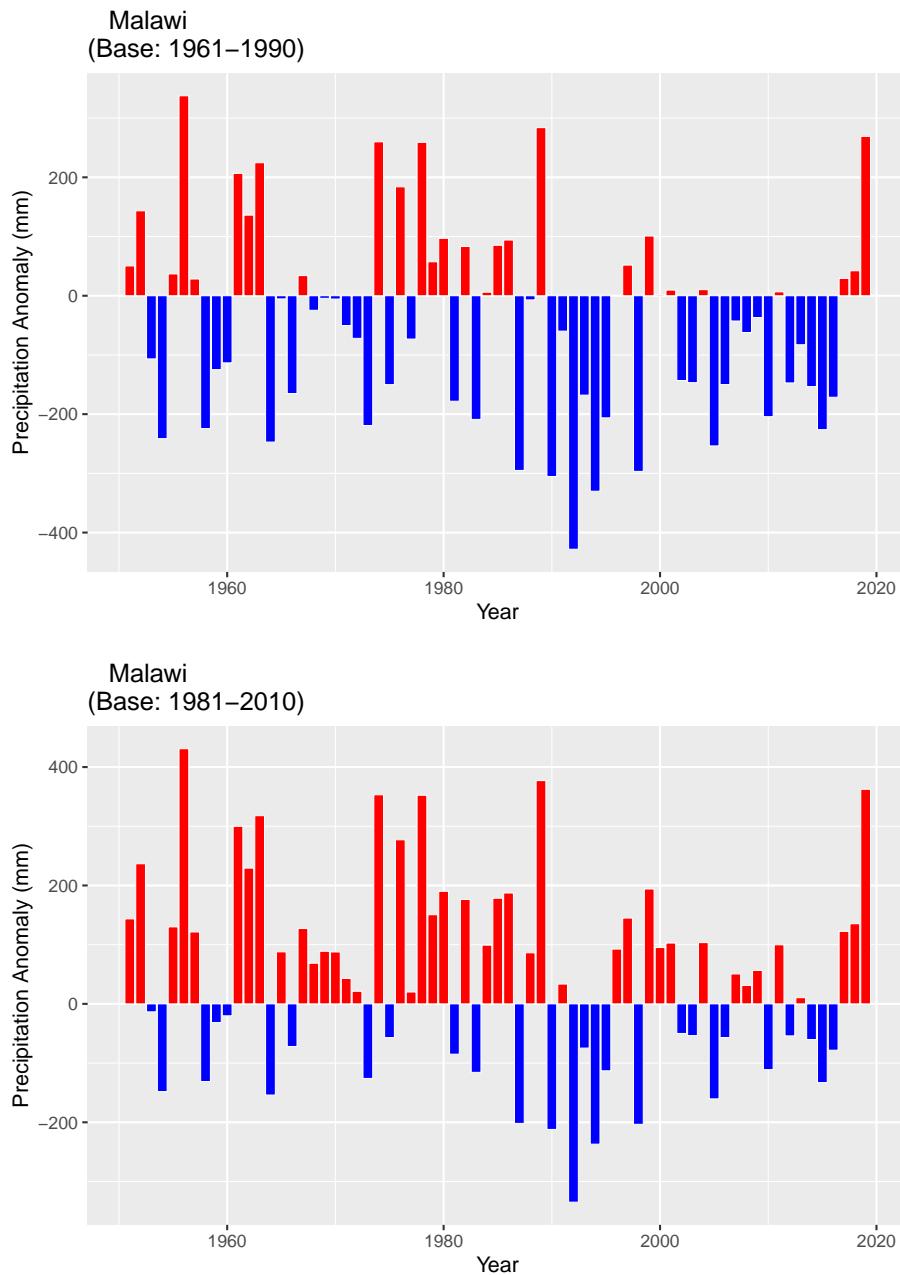
50. Historical Trends: The historical climate in Malawi has been described in many documentations with limited differences among the documents. There is a near-total agreement that vast surface water of Lake Malawi tends to have a cooling effect on the margins of the lake, where long, hot seasons with high humidity occur, along with mean annual temperatures of 24°C.

- Mean annual temperature has increased by 0.9°C between 1960 and 2006, an average rate of 0.21°C per decade. This increase in temperature has been most rapid in the rainy summer (December to February) and lowest in the hottest season (September to November).
- The average number of ‘hot’ days per year in Malawi has increased by 30 between 1960 and 2003.
- The average number of ‘cold’ days per year has decreased by 16 between 1960 and 2003.

#### 4.1.1 Temperature Anomaly



#### 4.1.2 Rainfall Anomaly

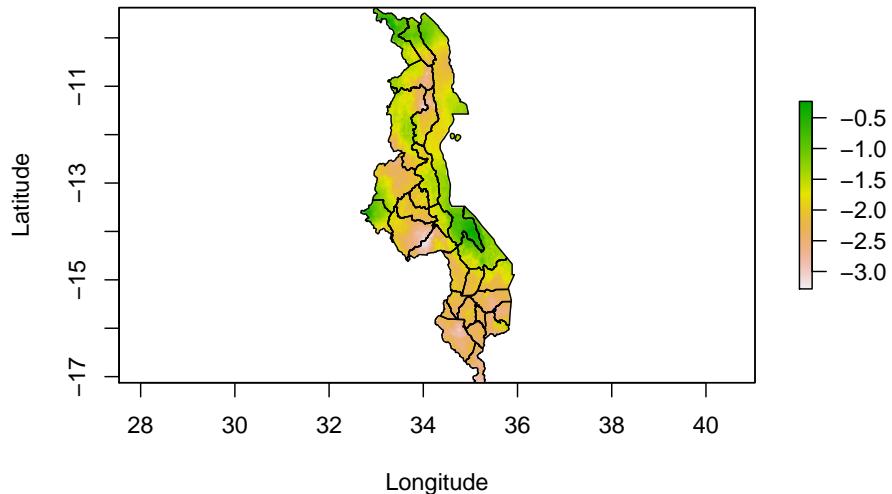


51. **Projected future climate:** Projections of temperature and rainfall for Malawi was done using statistically downscaled General Circulation Mod-

els (GCMs), following the procedure recommended by the Fifth Assessment Report (AR5) of the IPCC in 2013. It is worth noting that AR5 is premised on two Representative Concentration Pathways (RCPs) of GHG emissions, namely: RCP 4.5 (Intermediate Emission) and RCP 8.5 (High Emission)<sup>15</sup>. RCP 4.5 and 8.5 are respectively equivalent to story lines B1 and A1F1 in the AR4 of the IPCC (2007) as shown in Table 3.3.1. AR4 is commonly referred to as the Special Report on Emission Scenarios (SRES). RCP 8.5 or Scenario A1F1 is consistent with the following conditions: (a) three times today's CO<sub>2</sub> emissions by 2100; (b) rapid increase in methane emissions; (c) increased use of croplands and grassland driven by an increase in population growth; (d) a world population of 12 billion by 2100; (e) lower rate of technology development; (f) heavy reliance on fossil fuels; (g) high energy intensity; and (h) no implementation of climate change policies. RCP 4.5, which is comparable to SRES B1 scenario is consistent with the following conditions: (a) lower energy intensity; strong reforestation programmes; (b) decreasing use of croplands and grasslands due to yield increases and dietary changes; (c) stringent climate policies; (d) stable methane emissions; and (e) CO<sub>2</sub> emissions increase only slightly before decline commences around the year 2040.

## Temperature

### 4.1.2.1 ssp245



#### 4.1. MALAWI'S HISTORICAL TRENDS AND PROJECTED FUTURE CLIMATE37

Fig. 4a. Mean temperature change (C) for Malawi for 2020 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

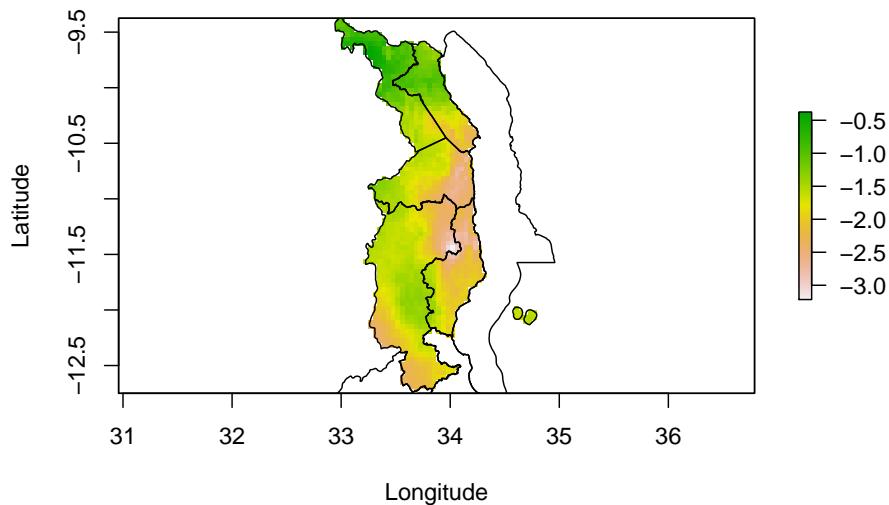


Fig. xx Mean temperature change (C) for Northern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

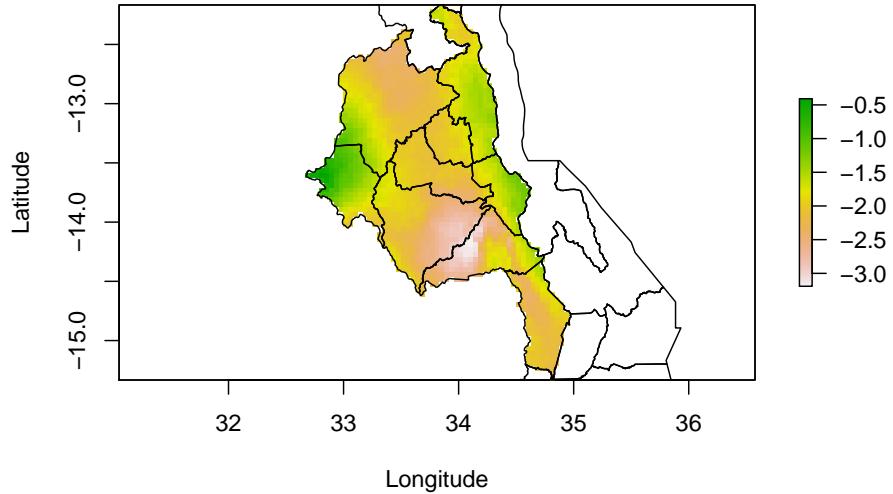


Fig. xx Mean temperature change (C) for Central Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

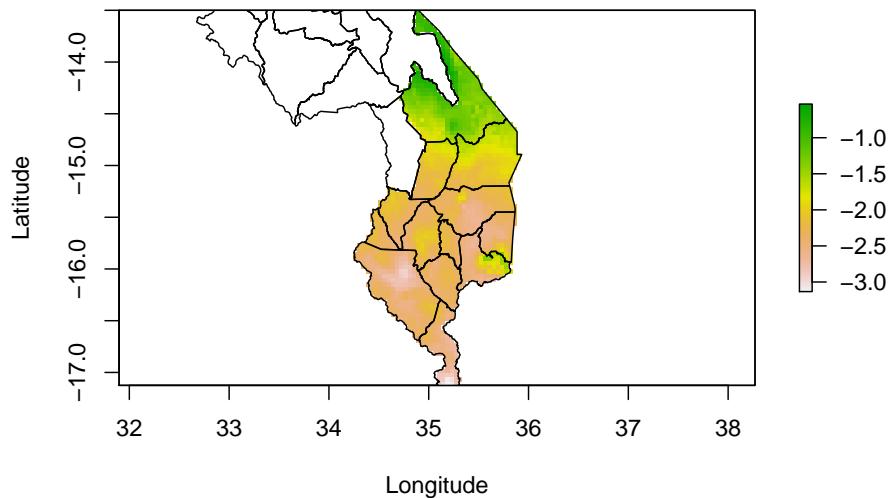


Fig. xx Mean temperature change (C) for Southern Malawi for 2021 – 2040

#### 4.1. MALAWI'S HISTORICAL TRENDS AND PROJECTED FUTURE CLIMATE39

compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

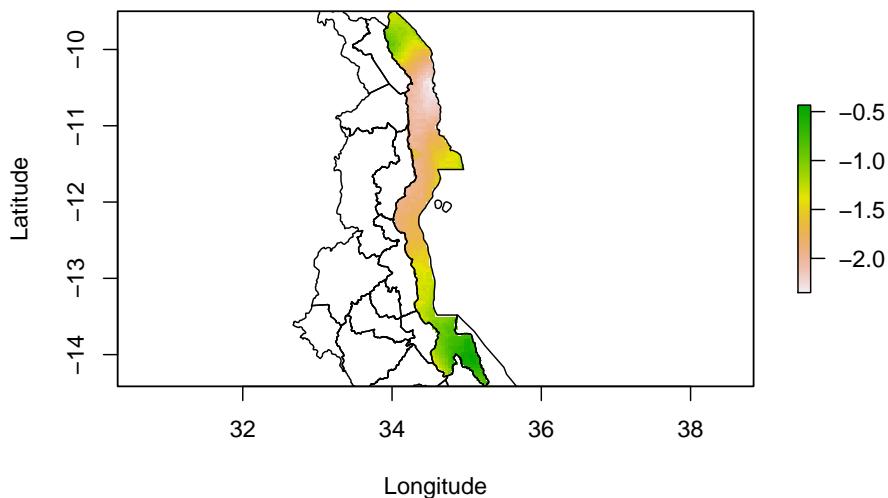


Fig. xx Mean temperature change (C) for the Area under National Administration for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

#### 4.1.2.2 ssp585

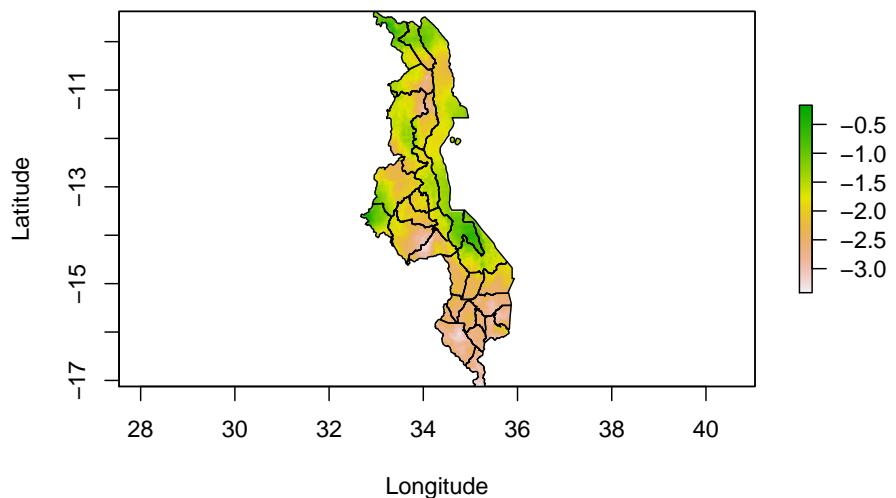
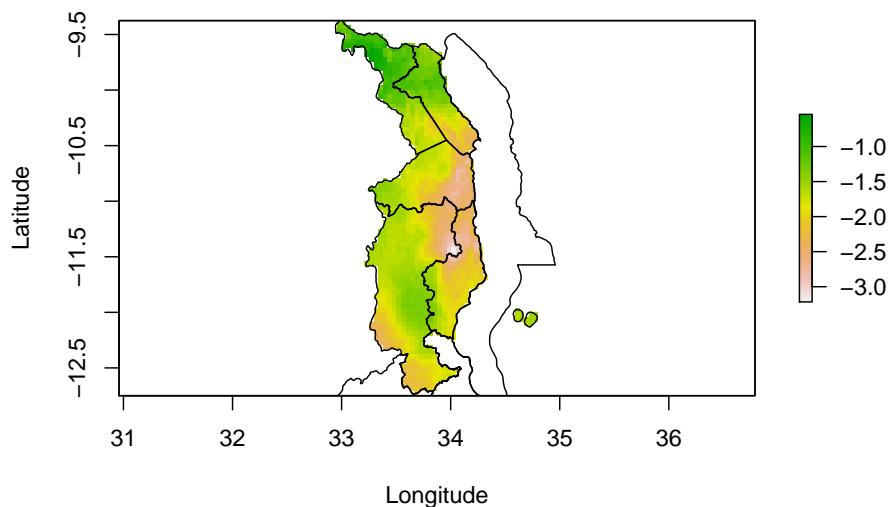


Fig. 4a. Mean temperature change (C) for Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model



#### 4.1. MALAWI'S HISTORICAL TRENDS AND PROJECTED FUTURE CLIMATE41

Fig. xx Mean temperature change (C) for Northern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

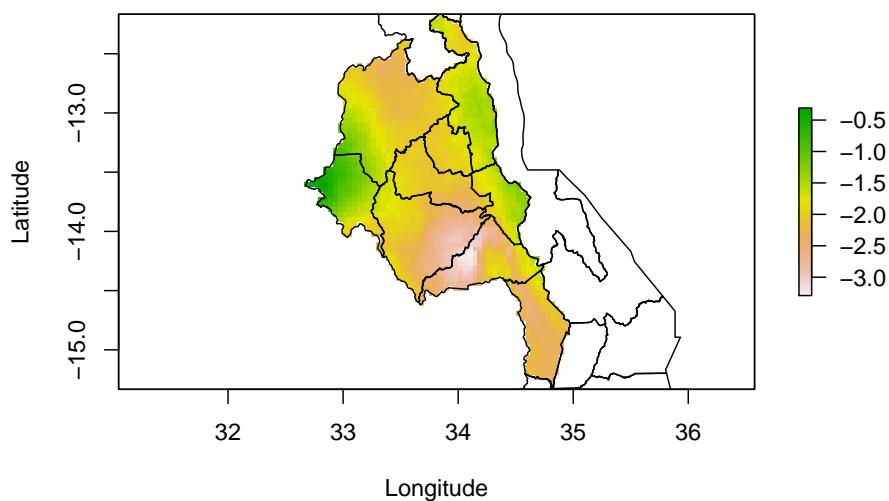


Fig. xx Mean temperature change (C) for Central Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

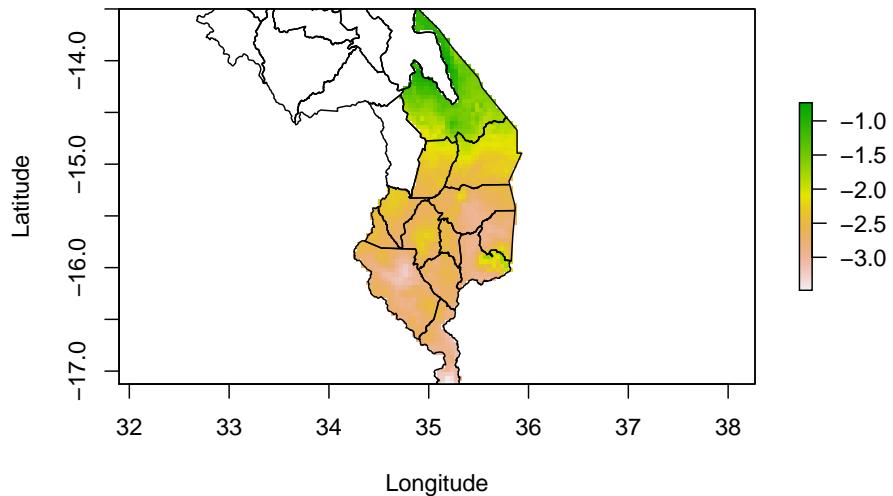


Fig. xx Mean temperature change (C) for Southern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

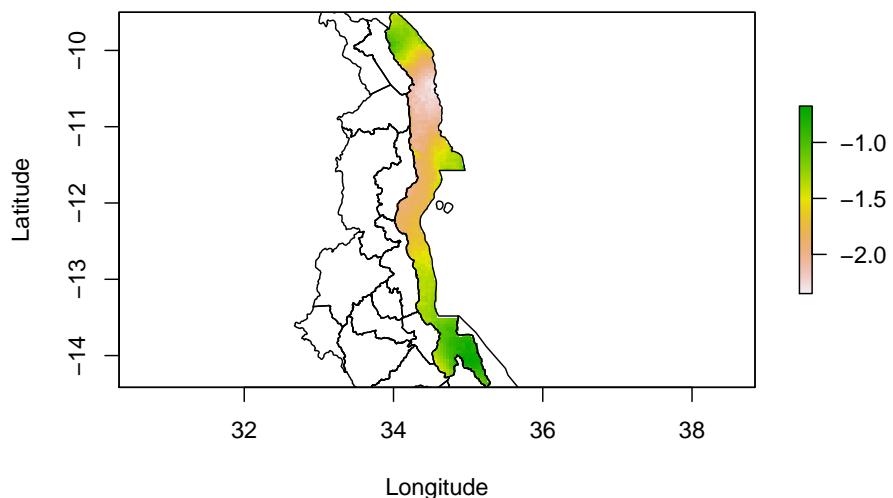


Fig. xx Mean temperature change (C) for the Area under National Adminis-

tration for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

### Rainfall

#### 4.1.2.3 ssp245

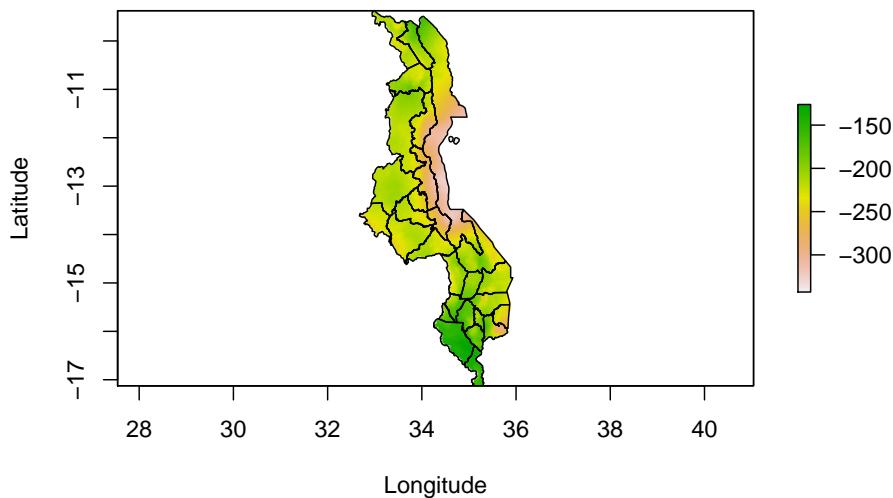


Fig. 4a. Mean Precipitation change (C) for Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

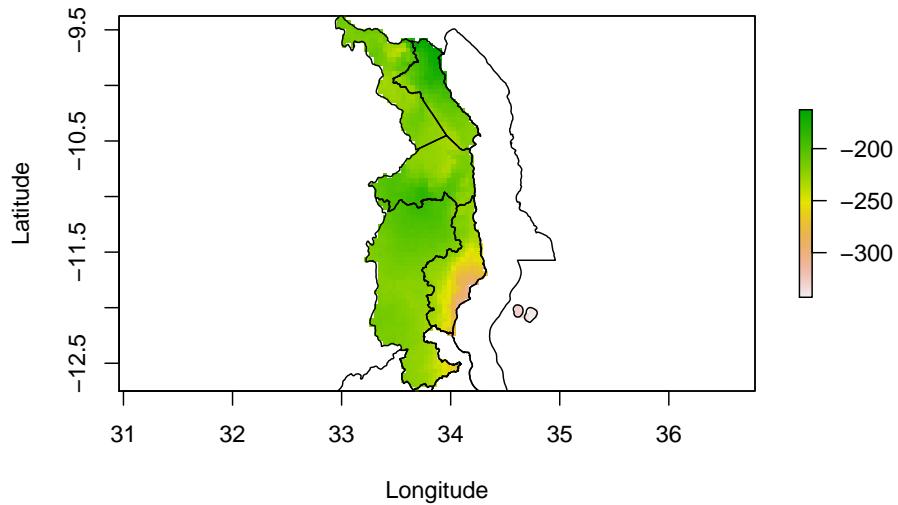


Fig. 4a. Mean Precipitation change (C) for Northern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

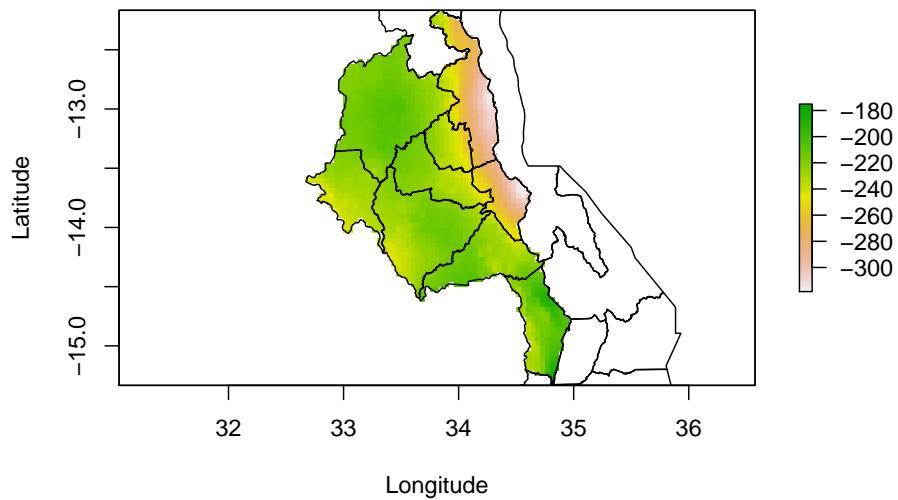


Fig. 4a. Mean Precipitation change (C) for Central Malawi for 2021 – 2040

#### 4.1. MALAWI'S HISTORICAL TRENDS AND PROJECTED FUTURE CLIMATE45

compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

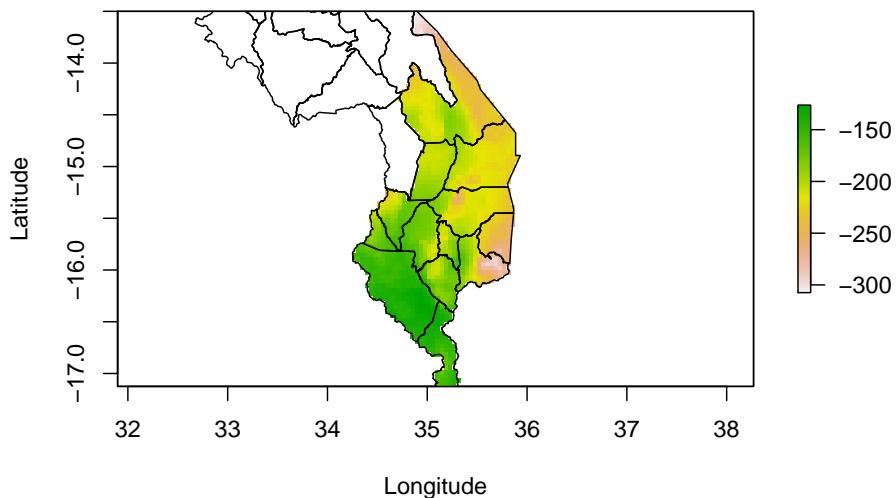


Fig. 4a. Mean Precipitation change (C) for Southern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

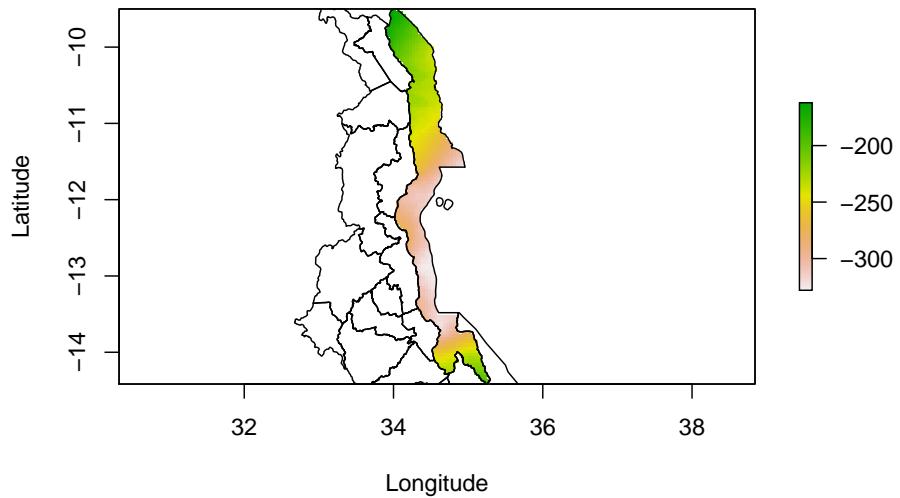


Fig. 4a. Mean Precipitation change (C) for the Area under National Administration for 2021 – 2040 compared to reference period 1971 – 2000 for the medium emissions scenario (ssp245). BCC-CSM2-MR Model

4.1.2.4 ssp585

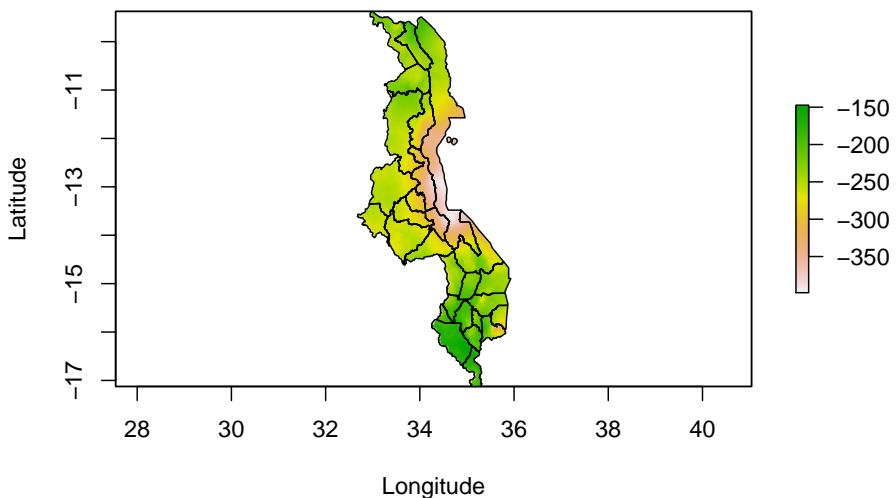


Fig. 4a. Mean Precipitation change (C) for Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

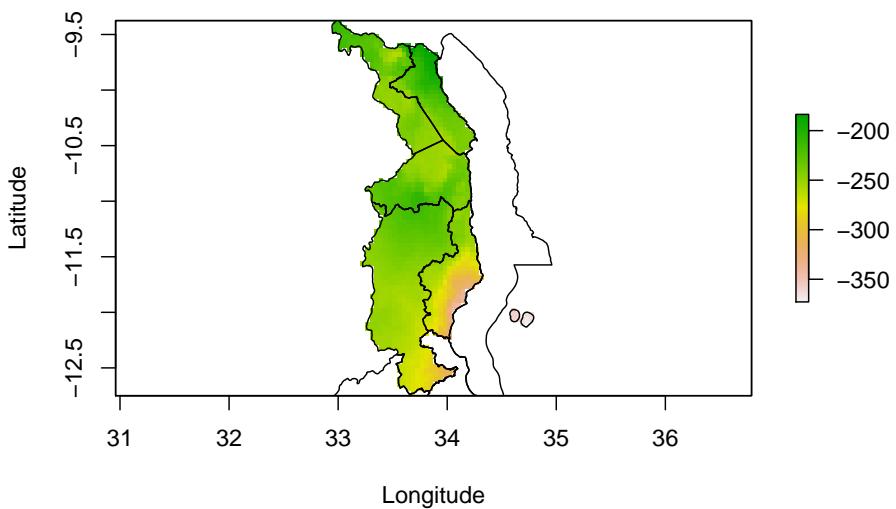


Fig. 4a. Mean Precipitation change (C) for Northern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

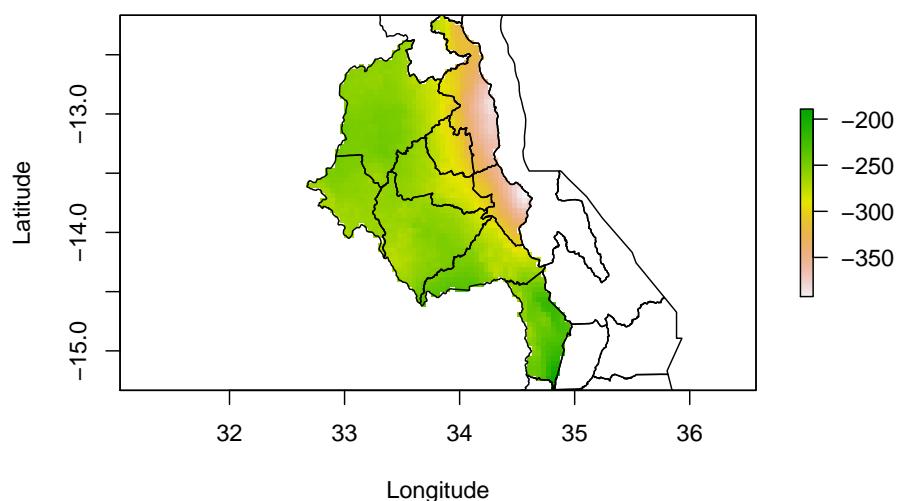


Fig. 4a. Mean Precipitation change (C) for Central Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

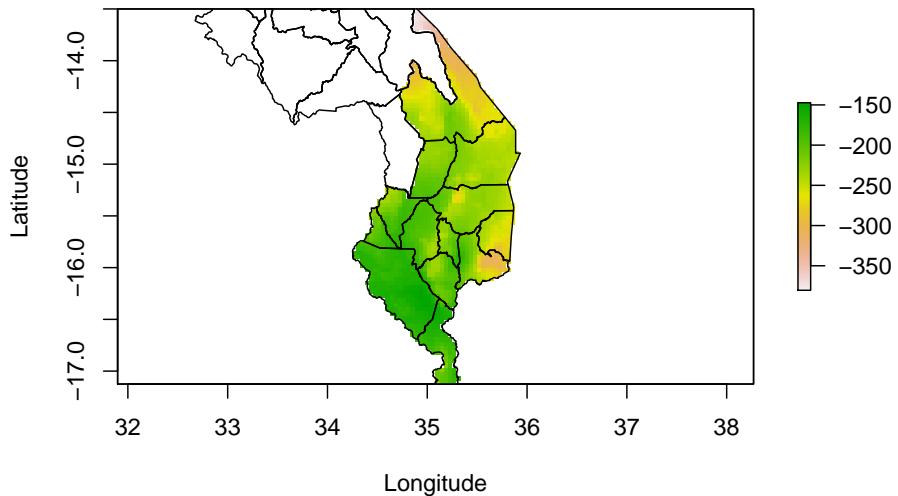


Fig. 4a. Mean Precipitation change (C) for Southern Malawi for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

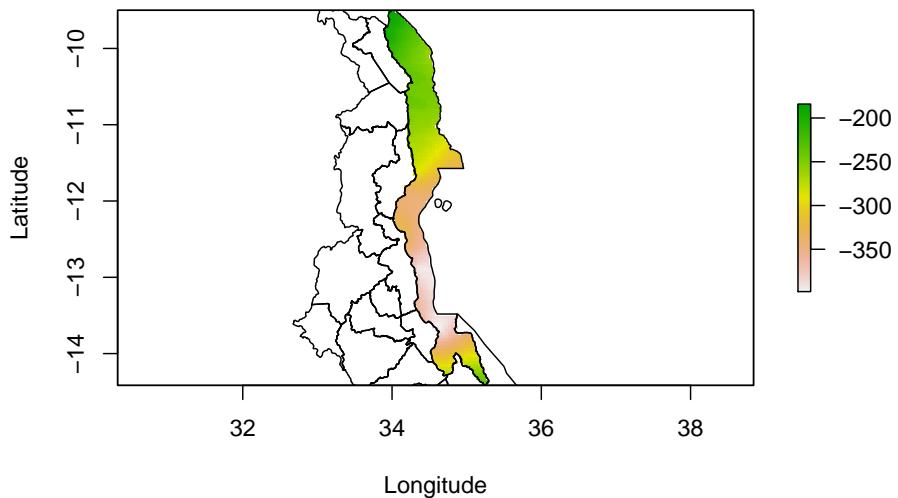


Fig. 4a. Mean Precipitation change (C) for the Area under National Adminis-

tration for 2021 – 2040 compared to reference period 1971 – 2000 for the high emissions scenario (ssp585). BCC-CSM2-MR Model

52. The following conclusions may be drawn from climate change scenario analysis results presented in Tables 3.3.2 and 3.3.3 about future expected temperature and rainfall regimes in Malawi using the two RCPs: (a) there is a positive trend in temperature rise, i.e., there will be an increase in temperature in Malawi with climate change; (b) minimum temperatures exhibit a faster rise in temperature with climate change than maximum temperatures; (c) generally, there is an insignificant decrease in rainfall during the October-December period, and an increase during January-March period; (d) future temperatures will rise by 1.30 C to 2.60 C; and (e) El Nino conditions will likely increase climate extremes, resulting in the increased severity, or magnitude/intensity, and frequency of floods, droughts and strong winds<sup>16</sup>

## 4.2 Vulnerability, Impacts and Risks of Key Systems

53. We employ a systems approach (a) to understand the interactions between water, energy and food systems and links with human resources in a national context, and b) to evaluate the system's vulnerability to the impacts of climate change.

### 4.2.1 The Water – Energy – Food System

4. This section explores vulnerability and opportunities for the WEF in promoting cross-sectoral policy linkages among water, energy, and food sectors at national level to achieve sectoral integration and sustainable development. The assessment provides an appraisal of the country's WEF resource endowment, climate change impacts, and policy and institutional arrangements. We further propose a country nexus framework for implementing the WEF nexus, as well as possible tools for monitoring and evaluating WEF nexus implementation.

#### Key Findings on the WEF Nexus

Our assessment indicates reveals that Water, Energy and Food subsystems in Malawi are strongly interactive, complex and dynamic. Unfortunately, their challenges have been tackled in isolation from one another. Importantly, they exist within a wider context of transformational processes – or drivers of change – such as population growth, climate change and urbanization that need to be taken into account (Fig 7).

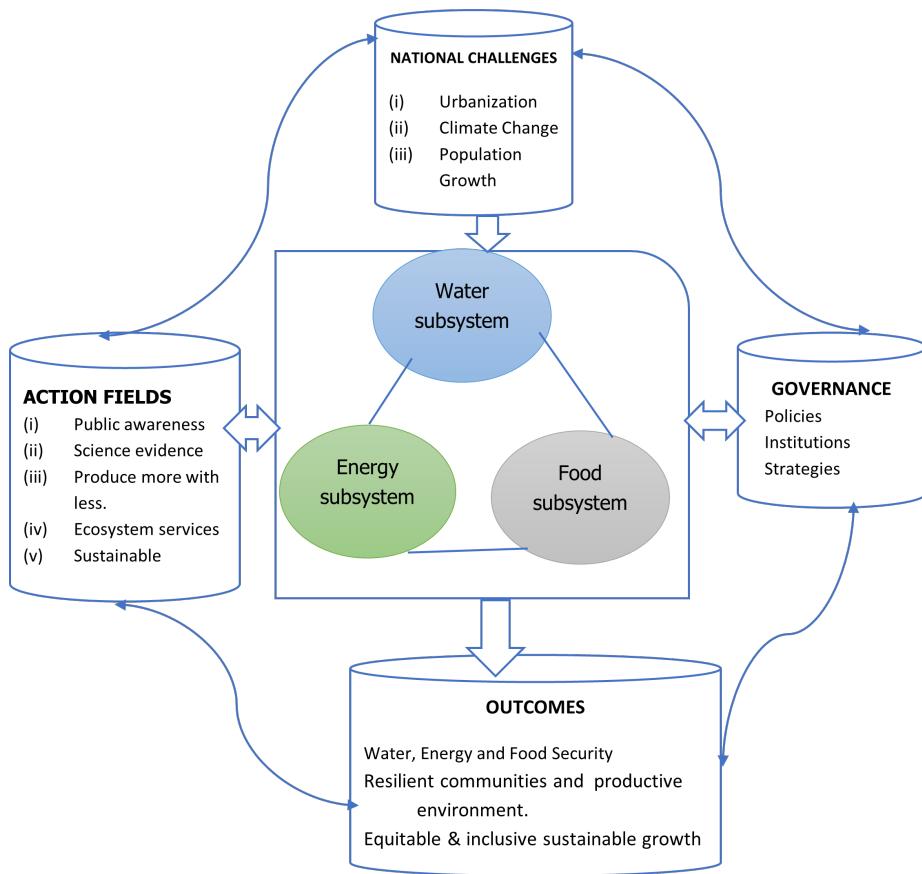


Figure 4.1: Figure 7 – The Water-Energy-Food System vulnerability Assessment Conceptual Framework

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A systemic description of the water resources can be categorized in three major components – water supply, water treatment, water collection and surface water management. Malawi relies on both surface- and ground-water sources, with an extensive river system covering 20 percent of the country's surface area, comprising the Shire, Ruo, Bua, Rukuru, and Songwe Rivers, and numerous lakes such as Malawi, Chilwa, Chiuta, and Malombe. Lake Malawi plays a particularly important role in surface-water supply in the socio-economic development of the country.

Water resource distribution exhibits dramatic spatiotemporal variation. Approximately, 90 percent of the runoff in major rivers occurs between December and June. Agriculture/irrigation is one of the major water-withdrawing sectors. Water withdrawal for agricultural and municipal purposes has concurrently risen owing to population growth.

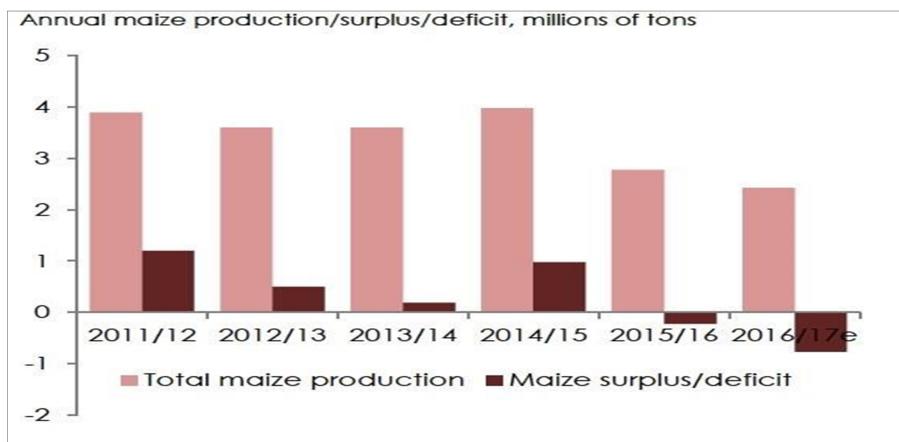
Malawi is water stressed and the per capita water availability continues to decline due to human population growth especially in the urban and peri urban areas (World Bank, 2007). However, in the past decades Malawi has made significant progress in increasing water supply coverage. In 2015 it surpassed its Millennium Development Goal water supply target. In 2014 over 80% of people had access to improved water sources within a distance of 200m for urban and 500m for rural areas and 93% had ana average time to collect drinking water (return trip) of less than 30 minutes (MoIWD, 2014).

In 2015 WHO/UNICEF Joint monitoring Programme (JMP) estimated that coverage for improved water supply was 90% nationally; 89% in rural areas and 96% in urban areas (WHO/UNICEF, 2015). In rural areas water source options include piped water and community hand pumps as well as household point of -use water treatment (Holm et al 2016). Nevertheless, water supply is being affected by climate change as evidenced by the increased frequency of droughts and floods (Pauw et al 2010; Chidanti-Malunga et al., 2011). However, the water supply services in the country experiences several challenges which makes water access in the country not equitable. One of the main challenges is the low functionality of the rural water supply services; with an estimate of about 25% water points not working at a given time (MoIWD, 2014). Impacts of Climate Change on Water Resources Frequent floods and droughts are the most severe effects of climate change in Malawi which highly impact the water system. Apart from causing the lack of access to water supply, drought derails the economic progress for communities.

Sector	Observed climate impacts	Geographical distribution
FOOD SYSTEM		Large parts of Malawi are vulnerable to flooding and droughts, particularly in the southern and central regions.
Crops		Malawi's agriculture is heavily dependent on rainfall, making it susceptible to climate variability and extremes.

Sector	Observed climate impacts	Global impact rating
	Reduced crop yield associated with heat and drought stress.	
	Changes in crop suitability due to shifts in agroecological zones.	
	Economic losses due to severe reductions in crop yields caused by frequent floods and droughts.	
Livestock	Increased animal mortality associated with intense heat, frequent droughts and floods.	Low- Medium

Drought periodically occurs, and the 2001 drought resulted in crop output decline by a third. Maize operation equivalent to 3% of GDP in fiscal year 2002/03 budget declined. In 1992 severe drought occurred which hit the country, 67% decline in maize output was experienced compared with previous year. The country experienced heavy floods in 2015 followed by drought. Alternating between drought and floods gives high rating on the impacts but medium impact for individual event. The pattern of maize is not currently resilient to the current climate and high levels of climate variability. However, evidence does not reveal consistent decreases (Figure 1.1).



On the other hand, tea the second largest export crop, decreased by 23%, cotton and Sugar production fell by 54% and 21% respectively. Agriculture, which accounts for 28% of GDP, contracted by an estimated 2%, on the back of a 1.6% decline in 2015 (Bhatia and Mwanakatwe, 2017). This explains the rating of the impact as medium high as most cash crops are affected.

The average temperature in Malawi ranges from 8°C in the northern highlands to 38 °C in the lowland regions around Lake Malawi and the Lower Shire Valley (Nhamo et al., 2019). Since the 1960s, Malawi has recorded an annual mean temperature rise of 0.9°C (Parrish et al., 2020). Analysed data from 1960 to

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2007 showed increasing drought frequency and intensity and the variability of rainfall, contributing to regional (SADC) insecurity of food and water (Godwell Nhamo & Muchuru, 2019). Malawi suffered seven severe droughts and 19 floods between 1967 and 2014 that adversely affected smallholders' production and food security (Haug & Wold, 2017). As a result, trends in people in need of food assistance (Figure 1) have increased between 2012 and 2016 (Haug & Wold, 2017).

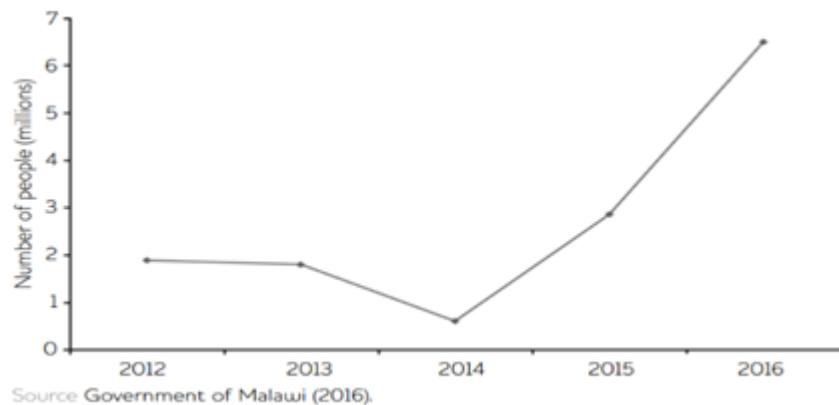


Figure 4.2: Figure XX: Trends in people in need of food assistance

WATER	...2	H
Water supply	Water quantity and quality disrupted by increasing frequency of droughts and floods.	H
Water treatment	Increased sediment, nutrient, and pollutant loadings from heavy rainfall and floods and droughts.	H
Water collection	Damage to water infrastructure and contaminated ground and surface water sources	H
Surface water management	Increased frequency and magnitude of floods associated with torrential rains.	H
	Reduction in waterflow in major rivers of the country due to reduction in rainfall	
ENERGY	Reduction in hydropower generation through changes in the mean annual streamflow and shifts of seasonal flows.	H

**Projected future climate** A significant amount of work has been carried out in Malawi in terms of projected climate changes. The Country Climate Brief by Future Climate for Africa (October 2017) provides downscaled predictions of useful future climate changes for Malawi (Mittal et al, 2017). It is interesting to note that 34 different Global Climate Change Models (GCMs) were used in

the analysis and a wide spread of results was obtained. (Figure 4-5 and Figure 4-6).

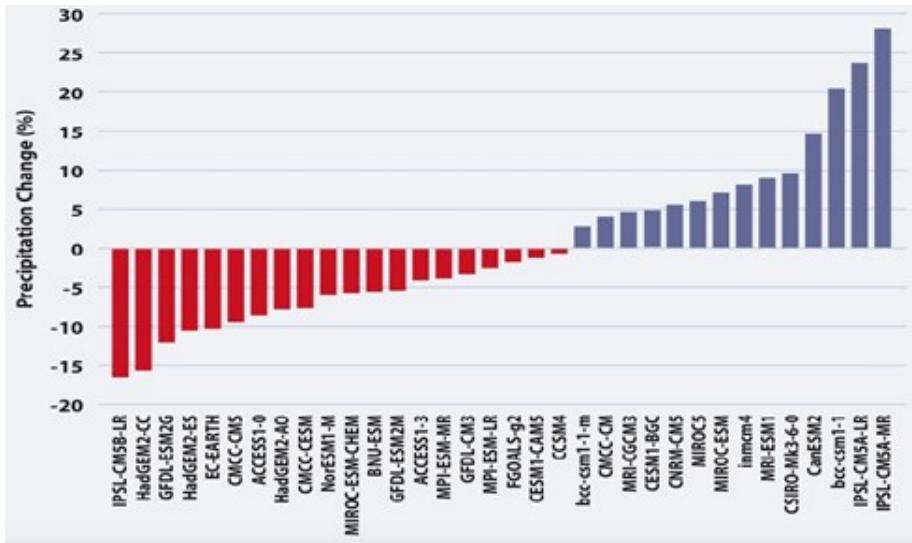


Figure 4.3: Figure 4-5: Predicted per cent change in annual mean rainfall for all Malawi

Note: The predicted change is between the GCM simulated current period (1976-2005) and 2070-2099 for 34 GCMs. Figure 4-5 shows a change in mean annual precipitation ranging between a decrease of 17 mm per annum to an increase of 28 mm. However, although there will only be relatively small changes in annual precipitation, the distribution of the rainfall events will change with higher concentrations of rain separated by longer dry periods (FAO, 2017).

Note: The predicted change is between the GCM simulated current period (1976- 2005) and 2070-99 for 34 GCMs.

Figure 4-6 shows an increase in annual mean temperature in the years 2070 to 2099 compared with the years 1976-2005 ranging between 2.5 and 5.3 C. Similar work by Warnatzsch & Reay (2019) indicates that current models can reasonably accurately project temperature trends but are not accurate for precipitation as shown in Figure 4-5. Regional Climate Models (RCMs) are suggested for more definitive and accurate modelling considering local topographic features and conditions. Future planners will thus need to consider a range of future precipitation scenarios. However, they conclude that model improvements would allow for better impact assessment and adaptation planning. It is also predicted that the number of days with a maximum temperature higher than 30 C will increase from 10 to 100 days per year by 2040 (FCFA, 2017). In most cases it is projected that the form of precipitation, whether increasing or decreasing will change to more frequent extreme (shock) events with longer dry spells between them. An

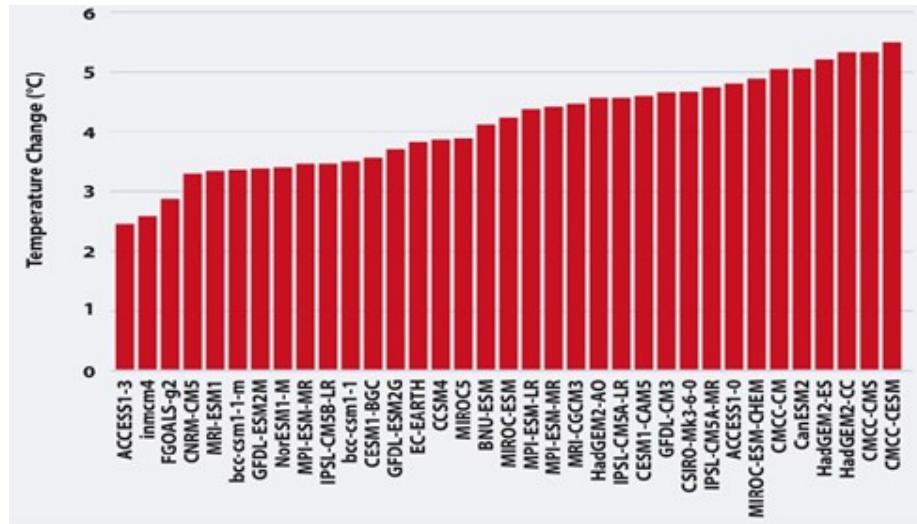


Figure 4.4: Figure 4-6: Change in annual mean temperature (°C)

increase in the number of cyclonic events affecting south eastern Malawi can also be expected. Issues such as increased temperatures will affect barometric pressures over the land and water masses in most countries leading to increased windiness (both velocities and duration). Other issues such as groundwater level changes are the result of a combination of changes in temperature and precipitation, together with changes in drainage characteristics and land-cover (and hence infiltration into the ground) that are likely to result from the general climate changes.

## Impacts, Vulnerabilities and Risks

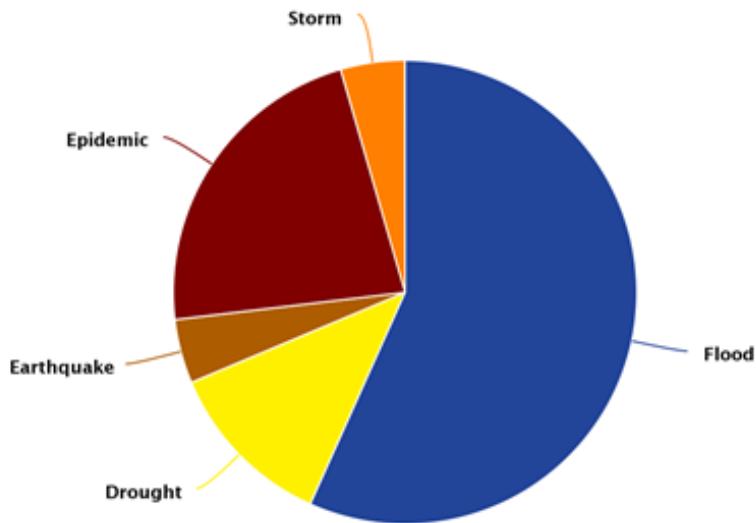


Figure 4.5: Figure 8 – Average Annual Natural Hazard Occurrence for 1900-2018.

Flooding in Malawi and Mozambique had affected nearly 843,000 people and caused at least 60 deaths as of 11 March, according to preliminary reports from the respective Governments. In Malawi, nearly 739,800 people have been impacted, according to the Government, with 45 deaths and 577 injuries recorded. More than 75,900 people are estimated to be displaced, with many ad hoc camps established and people living out in the open as their houses have been destroyed. Rapid needs assessments are ongoing in the areas hardest-hit by rains and flooding to verify initial estimates regarding the number of people affected and determine the number of people in need of immediate humanitarian assistance. In Mozambique, more than 103,100 people have been affected (more than 48,000 people in Zambezia, more than 51,200 in Tete and nearly 3,900 in Niassa), with 15 deaths recorded. Nearly 17,100 people are estimated to be displaced in Zambezia, Tete and Niassa, who are sheltering in 15 transit centres, and nearly 12,500 houses are reported to have been destroyed. Nearly 85,000 hectares of crops have been flooded, affecting more than 57,800 smallholder farmers. The water level is expected to rise in the next three days and may surpass the alert level in the Licungo, Zambeze, Pungoe and Buzi river basins. The Malawian and Mozambican governments are leading humanitarian responses in their respective countries, supported by humanitarian partners. In Malawi, humanitarian response, search and rescue efforts and rapid needs assessments are underway, and the Government has appealed for support in terms of provision of emergency relief items, including tents, food, medicines and helicopters for rescue operations and delivery of assistance. In Mozambique, authorities report needs related to food, water, shelter, education, seeds and health. The Government and partners are providing assistance to affected people. However, access has been damaging due to extensive damage to roads. The National Institute of Disaster Management in Mozambique estimates a funding requirement of about US\$18 million for food and non-food items, and an additional \$13.9 million for emergency road work in Zambezia (where 31 per cent of the road network has been damaged) and Cabo Delgado (50 per cent of the road network damaged). Tropical Cyclone Idai, which formed over the Northern Mozambique Channel on 9 March, is expected to make landfall near Beira on 14 or 15 March. The cyclone was located over the Mozambique Channel on 12 March and is expected to strengthen into intense tropical cyclone status (Category 4 equivalent) again prior to making landfall. Nearly 1.6 million people are estimated to live in areas that could be impacted by high wind speeds (>120km/h), according to the latest analysis from UNOSAT. After landfall, Cyclone Idai is expected to track inland, bringing heavy rain to central Mozambique and potentially into eastern Zimbabwe. The latest projections indicate that Idai may then turn back east and re-enter the Mozambique Channel, potentially going on to impact southern Madagascar



## **Chapter 5**

# **Chapter 4 – The National Adaptation Plan**

### **5.1 Overview**

This section describes the framework for the National Adaptation Programme considering strategic issues discussed under the preceding chapter. The chapter delineates the strategic vision, objectives and guiding principles of the NAP. The objectives are structured in line with the GEF 4.2. Vision, goals and objectives Vision – The vision is “a country resilient to the adverse impacts of climate change”. Goal - To strengthen resilience and reduce vulnerability to the adverse impacts of climate change in Malawi and support ongoing efforts to enhance adaptive capacity at the country, district and local levels. Specific objectives to achieve the goal are:

- (1) To reduce country vulnerability and increase resilience through innovation and technology transfer for climate change adaptation.
- (2) To mainstream climate change adaptation and resilience for systemic impact; and
- (3) To foster enabling environment for effective and integrated climate change adaptation in the country.

The NAP objectives entail moving towards the strategic integration of climate resilience into development planning and therefore necessitates looking at national budgets, development and investment plans as well as appropriate institutional arrangements.

## 5.2 Guiding Principles

The guiding principles for the NAP process those of the NAPA process, which included:

Guiding Principle	Description
1	Participatory and transparent
2.	Continuous planning process at the national level with iterative updates and outputs.
3.	A multidisciplinary and complementary approach
4.	Building on and not duplicating existing adaptation efforts
5.	Contribution to sustainable development
6.	Supported by comprehensive monitoring and review.
7.	Considering vulnerable groups, communities and ecosystems
8.	Cost-effectiveness
9.	Sound environmental management
10.	Flexibility of procedures based on individual country circumstances.
11.	Guided by best available science.
12.	Taking into consideration traditional and indigenous knowledge
13.	Gender-sensitive

## 5.3 Adaptation Priorities

- Key Risks and adaptation options
- Ranking adaptation actions

## 5.4 Implementation Strategy

- Promoting action by all actors and stakeholders: policy and capacity-development, outreach
- Better informed decision-making: climate information services, early warning, science and technology, decision-support modeling, research
- Addressing vulnerabilities and risks in key systems and sectors

- Packaging
- Policies
- Programmes
- Projects

## 5.5 Resources Mobilization

### 5.5.1 Alignment with the GCF Country Programme

### 5.5.2 Mobilization of other sources of finance

## 5.6 Monitoring and evaluation

- Theory of change (where applicable)
- Monitoring adaptation outcomes
- Monitoring the NAP process using the PEG M&E Tool

## 5.7 Reporting

- Adaptation communications/NDCs
- Links to SDG voluntary reporting and Sendai Framework Monitor
- Gender

## 5.8 Support for future NAPs

- Data and system observations to support future assessments
- Roadmap for review and update of the NAP in five years
- Addressing gaps and needs



## **Chapter 6**

# **Annexes**

### **6.1 Annex 1 – Annotations to related reports, strategies, action plans under the NAP and related to the NAP**

- Stocktaking report
- Assessment report
- NAP Road Map
- PPCR/SPRC
- National Resilience Strategies

### **6.2 Annex 2 – Country Profile**

- Climate change policies
- Recent climate change impacts
- Climate Change Projects under UNFCCC funds: GEF, LDCF, GCF
- Development Projects with Climate Change Components: Donor funded/Loans
- National Reports to the UNFCCC and Paris Agreement
- List of ongoing programmes and projects
- Data and information system to support the NAP

### **6.3 Annex 3**