



MALAWI GOVERNMENT

# MALAWI NATIONAL ADAPTATION PROGRAMMES OF ACTION

SECOND EDITION



Ministry of Natural Resources, Energy and Mining  
Environmental Affairs Department

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# **MALAWI NATIONAL ADAPTATION PROGRAMMES OF ACTION**

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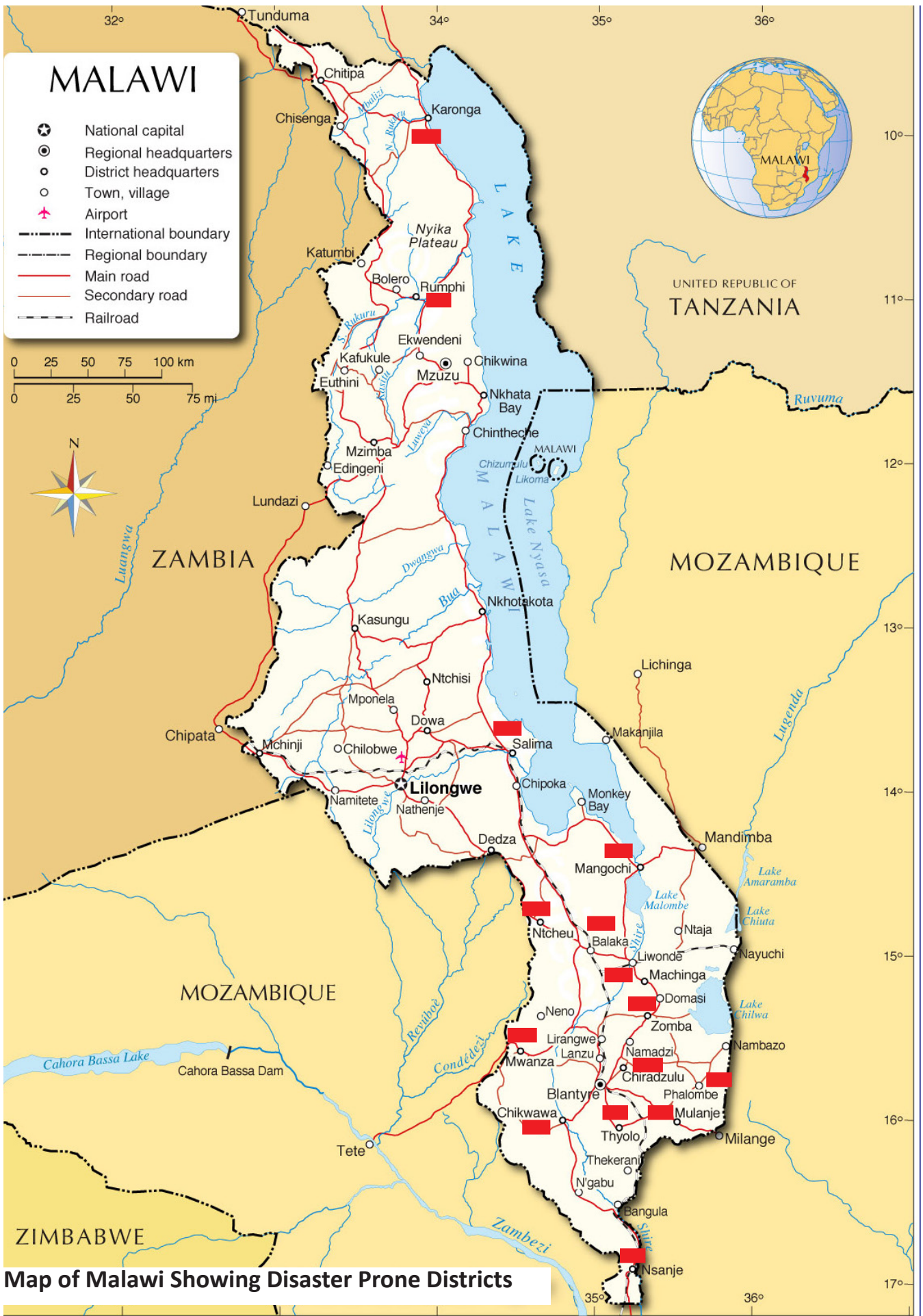


- 1. Top left:** Floods: Nsanje, Floods at Bangula Trading Centre, January 2015
- 2. Bottom left:** River line Rain gauge: Salima, Phaka, January 2012
- 3. Top right:** Wilting Maize: Mwanza, Traditional Authority Nthache, March 2012
- 4. Bottom right:** Canal Irrigation: Dedza, Traditional Authority Kachindamoto, August 2013

**Back Cover Photo:** Zomba Malosa Forest Reserve

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## Foreword

**T**he second edition of the National Adaptation Programmes of Action (NAPA) seeks to increase the adaptive capacity of vulnerable communities to adverse effects of climate change. This will be achieved through implementation of six urgent adaptation activities.

The six activities are:

- i. Improving existing early warning systems to enhance disaster preparedness and response;
- ii. Development of climate smart agriculture programmes to increase resilience;
- iii. Improving integrated water resource management to sustain agricultural production;
- iv. Restoring forests in all degraded areas across the country to increase forest cover and to reduce energy related problems;
- v. Improving rural electrification to increase energy access in rural areas; and
- vi. Integrating climate change into fisheries management to ensure sustainability of the fisheries sector.

The second edition of the NAPA culminates from a stock-taking of status of implementation and review of the first edition of the NAPA. The NAPA is a key instrument under the United Nations Framework Convention on Climate Change for addressing urgent and immediate adaptation actions. The NAPA provides a quick process for Least Developed Countries like Malawi to identify priority activities that respond to their urgent and immediate needs in order to adapt to climate change and climate variability.

The second edition of the NAPA is up to date, action-oriented, country driven and based on current sectoral priorities. My Ministry is committed to addressing adverse effects of climate change and integrating it into the socio-economic development agenda. Therefore, mainstreaming climate change adaptation into sectoral plans, programmes and strategies is of utmost importance.

For medium to longer term planning, my Ministry is facilitating the development of National Adaptation Plan to provide strategic guidance of the country's longer term adaptation priorities.



**Honourable Bright Msaka, SC**  
**MINISTER OF NATURAL RESOURCES, ENERGY AND MINING**

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The process of developing the second edition of NAPA started with a stocktaking of status of implementation of the first edition of NAPA. The findings of the Stock-taking Report were presented to stakeholders in December 2014 for their inputs.

Environmental Affairs Department would also like to thank the team from Centre for Environmental Policy and Advocacy for carrying out the stocktaking of status of implementation and review of the first edition of NAPA and developing the second edition of NAPA. The Centre for Environmental Policy and Advocacy team comprised of:

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Environmental Affairs Department is also grateful to the United Nations Development Programme for providing technical and financial support through the National Climate Change Programme for the preparation of the second edition of NAPA.

The Report proposed the implementation of urgent adaptation interventions in nine key sectors that are vulnerable to climate change and climate vulnerability. Out of the 53 adaptation options that were initially identified, only 6 have been prioritized and developed into project profiles.



**Mrs. Tawonga G. Mbale-Luka**  
**DIRECTOR OF ENVIRONMENTAL AFFAIRS**



## List of Acronyms and abbreviations

CAI	Climate Action Intelligence
CCRF	Climate Change Response Framework
CISONECC	Civil Society Network on Climate Change
CoP	Conference of Parties
CSA	Climate Smart Agriculture
CSOs	Civil Society Organizations
EAD	Environmental Affairs Department
ECRP	Enhancing Community Resilience Programme
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GoM	Government of Malawi
LDCs	Least Developed Countries
LEG	Least Developed Countries Expert Group
MCA	Multi-Criteria Analysis
M&E	Monitoring and Evaluation
MGDS	Malawi Growth and Development Strategy
MPRSP	Malawi Poverty Reduction Strategy Paper
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Plan
NAPA	National Adaptation Programmes of Action
NCCIP	National Climate Change Investment Plan
NGO	Non-Governmental Organization
NSCCC	National Steering Committee on Climate Change
NSSD	National Strategy for Sustainable Development
NTCCC	National Technical Committee on Climate Change
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WSSD	World Summit on Sustainable Development

# Executive Summary

## Introduction

Malawi is one of the most vulnerable countries to climate change and variability. Prolonged dry spells, seasonal droughts, intense rainfall, riverine and flash floods remain the most serious climatic hazards in Malawi. The groups that are most vulnerable to these climate risks are mostly subsistence farmers, urban poor and fishermen.

In order to address these challenges, Malawi, launched its National Adaptation Programmes of Action (NAPA) in 2008. This first edition of NAPA set the main priorities to adapt to climate change which emphasized on improving community resilience. Following the launch, there has been an increase in climate change interventions in the country. However, implementation of these interventions has been largely uncoordinated and has suffered from limited financing. In addition, there have been changes in the economic landscape, as well as policy and legislative areas in the country warranting revision of the NAPA for it to continue being relevant, hence this 2<sup>nd</sup> NAPA Edition.

The second edition highlights the vulnerable sectors that need urgent adaptation; key adaptation needs and prioritized adaptation options.

## Vulnerable Sectors in Urgent Need of Adaptation

The vulnerable sectors in need of urgent adaptation interventions are: agriculture, human health, energy, fisheries, wildlife, water, forestry, gender and infrastructure development.

- i) **Agricultural sector** – increase in temperature, changes in rainfall patterns, especially the uncertainty in the rainfall onset, and climate variability have considerable negative impacts on agricultural productivity and food security.
- ii) **Human health sector** – increased temperature, floods and droughts have affected magnitude and distribution of malaria, malnutrition and diarrhea. Women bear the burden of looking after the sick thereby being rendered economically less productive.
- iii) **Energy sector** – floods and droughts coupled with deforestation and poor farming practices in the catchment area, especially along the Shire River Basin and its tributaries are affecting hydro-electric power generation which in turn impacts on industrial productivity and lifestyles. Over reliance on biomass and inadequate coverage of electricity is resulting in women and girls walking long distances to collect firewood.
- iv) **Fisheries sector** – floods, droughts and wind patterns have led to reduced fish catches, changes in species composition, disturbed food web and degraded aquatic environment.
- v) **Wildlife sector** – forest fires and rainfall patterns are resulting in habitat destruction and disturbances to food cycles.
- vi) **Water sector** – floods and droughts are affecting water availability and quality. This is exacerbated by lack of flood zone mapping and early warning systems.

**vii) Forestry sector** – forest fires, mean annual increase in temperature and changes in precipitation are causing destruction of natural resources and habitats.

**viii) Gender** – women and girls are more dependent on natural resources as they are responsible for collection of firewood, water and ensuring daily access to food for the household. Long distances to water and firewood sources are increasing the burden on women and girls.

**ix) Infrastructure development sector** – unstable environmental and climatic conditions, particularly floods are affecting infrastructure.

## Identification of Key Adaptation Needs

Malawi's vulnerability arises from significant exposure to current climate variability; high sensitivity of agriculture; and rural livelihoods. Moreover there is limited adaptive capacity.

## Prioritized Adaptation Options

A total of 53 adaptation options were proposed from the nine sectors through stakeholder consultations. Using multi criteria analysis, standardization of scores and rationalizing adaptation options related to gender and infrastructure 15 priority adaptation options were identified. Based on the 15 priority adaptation options, six urgent activities have been identified and developed into project profiles.

The six project profiles that the country needs to implement urgently and immediately are as follows:

- (a) Improving existing early warning systems to enhance disaster preparedness and response;
- (b) Development of climate smart agriculture programmes to increase resilience;
- (c) Improving integrated water resource management to sustain agricultural production;
- (d) Restoring forests in all degraded areas across the country to increase forest cover and to reduce energy related problems;
- (e) Improving rural electrification to increase energy access in rural areas; and
- (f) Integrating climate change into fisheries management to ensure sustainability of the fisheries sector.

# 1.0 Introduction

## 1.1 Background

Malawi is a sub-Saharan African country, a part of the world that experiences frequent climate change impacts, hence the need for a systematic plan of adaptation. The National Adaptation Programmes of Action (NAPA) recognises that climate change cuts across several sectors affecting the socioeconomic wellbeing of the country, its citizens and ecosystems. The NAPA process was conventionalised to provide a process for Least Developed Countries (LDCs) to identify priority activities that respond to their urgent and immediate needs to adapt to climate change. These are the needs for which further delay would increase vulnerability and/or costs at a later stage.

The first edition of NAPA for Malawi was launched in 2008 and was designed to be action-oriented, country-driven and flexible, based on national priorities and circumstances, in order to effectively address urgent and immediate adaptation needs. The first edition of NAPA was presented in a simple format, easily understood both by policy-level decision-makers and the public. As a result, it has served as a policy document as well as a strategy document. Following on from the launching of the first edition of NAPA in 2008, there has been an increase in the number of climate change interventions at different levels. However, studies such as the Climate Action Intelligence (CAI, 2013) indicate that the increase is due to either of the following: a) that projects are being “relabelled” in order to attract funding from interested sponsors; or b) that climate change is being invested in as a new area of activity as a result of mainstreaming climate change activities into planning.

Nevertheless, the increase in climate change interventions in the country shows that there has been some response with more focus on adaptation. Most interventions were also implemented in most impacted districts of Nsanje, Chikwawa and Salima, which were described as hotspots districts prior to the launching of the first edition of NAPA. However, the need to increase and coordinate the climate change adaptation actions and interventions has also come out clearer because climate change interventions continue to be implemented in an uncoordinated manner and without any form of centralized monitoring and evaluation (M&E).

Furthermore, the number of disaster prone districts has grown significantly since the first edition of NAPA, from six to fifteen and may increase further following the evident vulnerability of additional districts in the recent flooding in 2015. The 15 districts are: Karonga, Rumphi, Salima, Ntcheu, Mangochi, Balaka, Machinga, Zomba, Chiradzulu, Blantyre, Thyolo, Mulanje, Phalombe, Chikhwawa and Nsanje.

There has been a lot of momentum generated by the NAPA process, both prior to and post, the launching of the first edition of NAPA despite delays in mobilizing resources to implement the programmes.

## 1.2 Economic Situation

Malawi has a narrow economic base, which is also affected by demographic and climatic factors stemming from limited agro-processing facilities, pre-dominance of rain-fed agriculture, over-dependency on bio-energy, and poverty. Malawi is also endowed with various natural resources. If properly used these natural resources would provide the basis for sustainable economic development of the country. However the country experiences reduction of the productivity

potential of its ecosystems to produce the desired goods and services which affects economic development.

Agriculture remains the most important sector of the Malawi economy as it employs about 80% of the total workforce, contributing well over 80% to foreign earnings. This accounts for almost 40% of gross domestic product (GDP). Agriculture also contributes significantly to national and household food security.

The majority of the people are resource poor and continue to engage in subsistence rain-fed agriculture. More than half of these communities are food insecure on a year-round-basis (Action Aid, 2011). The elderly, women and child headed families are the most vulnerable. This situation is exacerbated by increasing poverty and population pressures on a limited land resource base. Other factors include low economic productivity of the land, labour and capital, and extreme weather events due to climate variability, and low capacity to adapt to the adverse impacts of climate change.

These have been compounded by rapid environmental degradation worsening the unabated agricultural expansion to marginal lands and deforestation, inadequate knowledge and skills in the productive use and management of land and natural resources, inadequate access to land and credit, poor health services, and gender inequalities.

### **Major Cash and Food Crops**

The agricultural sector is composed of small-holder and the estate sub-sectors. The small-holder sub-sector contributes 70%, while the estate sub-sector contributes 30% of the total agricultural contribution to GDP. Small-holders cultivate mainly food crops such as maize, cassava, rice and sweet potatoes to meet their subsistence requirements. Other food crops that have been used particularly to serve to bridge shortage in maize production are sorghum and millet.

Estates mainly focus of high value cash crops for export such as tobacco, tea, sugar, coffee and macadamia. Small-holder farmers are mainly found cultivating in small, fragmented land holdings under customary land tenure with yields lower than in the estate sector.

## **1.3 Vulnerability to Climate Change**

Malawi's economy is agro-based and it is heavily dependent on natural resources, mainly soil and water, fisheries from inland lakes and fuel wood from forests. Changes in climatic patterns and any increase in extreme weather events result in serious impacts on socio-economic sectors. The climatic hazards that Malawi experience are prolonged dry spells, seasonal droughts, intense rainfall, riverine floods and flash floods. These have been increasing in frequency and magnitudes over the years and this is exacerbating vulnerability and poverty levels.

These extreme events cause loss of life, damage property and infrastructure, affect food security and hinder efforts in poverty eradication. As a result, planning at national, regional and local levels needs to take into account the additional risks brought about by climate change, but also to include measures that will support local communities in reducing their vulnerability and building their resilience to current and future risks.

The first edition of NAPA set the main priorities to adapt to climate change which emphasized

on improving community resilience to climate change through the development of sustainable livelihoods and improving agricultural production under the changing climatic conditions. Essentially these priorities targeted crop, livestock, and fishery activities aimed at improved nutrition through diversification of food production and dietary components for improved nutrition at household level.

## 1.4 Rationale for Developing the revised NAPA

The NAPA is a key instrument under the United Nations Framework Convention on Climate Change (UNFCCC) for addressing urgent and immediate adaptation actions. The NAPA also provides a quick process for LDCs to identify priority activities that respond to their urgent and immediate needs to adapt to climate change. As a result, it must be more up to date, action-oriented, country driven, flexible and based on current national priorities and circumstances. In order for the NAPA to effectively address urgent and immediate adaptation needs, the document has to be current. Hence the need to revise the NAPA in order to recast the new and emerging urgent and immediate adaptation needs.

In all likelihood, the structure of the second edition of the NAPA is quite similar to the first edition. The first edition of NAPA contains a list of key priorities usually identified in terms of sectors such as agriculture and water resources; and tend to focus on 'hardware' solutions such as infrastructure with less attention given to approaches related to capacity building of communities, education and disaster risk reduction. The second edition of NAPA seeks to increase the adaptive capacity of vulnerable communities to adverse effects of climate change as well as to revise the adaptation approaches in line with current drivers and pressures.

More than eight years have elapsed since the first edition of NAPA was developed. However, there have been implementation challenges resulting from inadequate financing, lack of ownership by sectors and a centralized coordination of the implementation. This is owed to absence of the National Technical Committee on Climate Change (NTCCC) and National Steering Committee on Climate Change (NSCCC) during the early stages of NAPA implementation. In addition, there was no mechanism to facilitate monitoring and evaluation (M&E) of impact from the interventions.

Furthermore, the policy and legislative changes as well as the sectoral and economic policy instruments introduced in the last decade and recent decisions and outcomes adopted by the Conference of the Parties (CoPs) to UNFCCC have had implications on climate change management. At national level, Government of Malawi (GoM) approved the Malawi Growth and Development Strategy II (MGDS II). MGDS II has climate change, natural resources and environmental management as one of its key priority areas.

In addition, GoM recently launched a National Environment and Climate Change Communication Strategy (NECCCS), and National Climate Change Investment Plan (NCCIP) to ensure that the key priority areas of actions to address climate change and its effects are timely and sufficiently supported. Then too, there is a National Climate Change Policy. Moreover, GoM has also made a number of climate change related policy statements under various existing sectoral policies such as National Environmental Policy (NEP), National Strategy for Sustainable Development (NSSD), National Water Policy and National Energy Policy.

## 1.5 Objectives of the NAPA

The second edition of NAPA has been developed to enable Malawi to continue addressing the urgent and immediate adaptation needs caused by climate change and extreme weather events as they emerge and evolve. Medium and long term adaptation interventions will be covered in the National Adaptation Plan (NAP) process. The second edition of NAPA has been prepared to address gaps identified in the first edition of NAPA. Some of the pertinent issues are also related to inadequate climate change mainstreaming in sectors that are not directly environment related.

In this regard, since impacts of climate change cut across sectors, efforts to mainstream climate change in sectors such as education, gender and health have become very important. While GoM succeeded in gathering the main stakeholders around the NAPA objectives and process, the private sector continues to remain a secondary participant to formulate and implement projects. The development of a private-sector engagement strategy around adaptation and risk management would be of benefit. In particular, it may be useful to develop tools to assist private sector in integrating projected climate changes into their investment planning.

## 2.0 Framework for Adaptation Programme

### 2.1 National Vision

The Malawi Constitution enacted in 1994 outlines the key motivations guiding the new democratic governance: the need to safeguard the sanctity of human life and the development and welfare of the people of Malawi<sup>1</sup>. The country's Vision 2020 adopted in 1998 on the other hand articulates the long-term vision for Malawi as a 'secure, democratically mature, environmentally sustainable, self-reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values and being a technologically driven middle-income economy'. These provide broad policy aspirations that have been further concretized both under the Constitution in form of principles of national policy providing for sustainable development<sup>2</sup> and the bill of rights guaranteeing the right to life, right to development and dignity of the human person<sup>3</sup> as well as key economic instruments.

Thus in line with the constitutional order Malawi adopted the Malawi Poverty Reduction Strategy Paper (MPRSP) which was implemented up to 2005. The main objective of the MPRSP was to reduce poverty through socio-economic and political empowerment of the poor. The MPRSP was replaced by MGDS I (2006 - 2011), which was intended to promote economic growth to meet key development objectives.

The links between adaptation to climate change and development have been increasingly highlighted<sup>4</sup>. There is clear linkage between poverty reduction, development and climate change. This is largely because climate change is expected to have enormous detrimental impacts on poverty reduction and food security, and must therefore be considered as an integral component of sustainable economic development. It has therefore been observed that an increase in the frequency and magnitude of shocks due to climate change potentially cause countries to fall into 'poverty traps' and make it highly difficult for them to build resilience out of these traps. Therefore, a comprehensive approach to adaptation and its integration into development policies is crucial for poverty eradication<sup>5</sup>.

The MGDS I and II identified Managing Climate Change, Environment and Natural Resources as one of the nine priorities within priorities of GoM underscoring the central importance of environment and natural resources in general and climate change in particular to the country's development efforts. This development blueprint recognizes that sustainable socio-economic development cannot be achieved without effective management of climate as well as environment and natural resources.

The MGDS II (2011 – 2016) has further noted that despite some progress to address the country's environmental problems, there are still teething problems that need to be addressed. In particular the MGDS II identifies climate variability, weak institutional capacity for managing climate change, inadequate mainstreaming of climate change issues; weak enforcement of acts and regulations; accelerated deforestation and poor land use management practices as requiring special attention.

1 Preamble to the Constitution of Malawi;

2 Section 13.n of the Constitution requires the state to manage the environment responsibility and to take into account the interests of future generations;

3 See section 16 which provides the right to life, section 19 provides for human dignity and section 30 provides for the right to development;

4 Adger, W.N., S. Huq, K. Brown, D. Conway and M. Hulme, 2003: Adaptation to climate change in the developing world. *Progress in Development Studies*, 3(3), 179–195;

5 Frank Lecoq and ZmalakShariz (2007), How might climate change affect economic growth in developing countries? (The World Bank Development Research Group, Washington);



Mainstreaming climate change issues is important so that there is policy harmonization and coordination across relevant sectors.

## 2.2 International and National Policy Instruments

The World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 provided a strong impetus to the linkage between climate policy and development. This has led to exploring and developing the concept of “mainstreaming” of policies and measures that address climate change into development planning and ongoing sectoral decision-making. The aim is to ensure the long-term sustainability of investments as well as to reduce the sensitivity of development activities to both today’s and tomorrow’s climate<sup>6</sup>.

Thus the extent to which people and communities are vulnerable to climate change depends in part on the magnitude and rate of climate change and its consequent impacts as well as on their adaptive capacity. The higher sense of urgency and seriousness with which the adaptation challenge is now approached by the international policy community, was confirmed under the Bali Action Plan adopted at the 2007 UNFCCC negotiations<sup>7</sup>. This has in turn sparked the need to integrate adaptation measures into all development policies so that they are not considered an ‘add on’ or extra requirement after a development activity has been undertaken.

Malawi has adopted a number of policies and plans to address the integration of climate change issues into development. The National Environmental Action Plan adopted in 1994 was revised in 2002. Among the many challenges to sustainable environment and natural resources management are a high rate of soil erosion, climate change, loss of biodiversity, overfishing, overgrazing, water resources degradation and deforestation. These have significant impacts on the livelihoods of poor people.

The NSSD adopted in 2004 sets out a number of targets intended to ameliorate environmental degradation and the adverse effects of climate change. The NSSD addresses climate change under theme 3 of the Johannesburg Plan of Implementation of WSSD. The theme deals with the protection and management of the natural resources base of economic and social development. It calls upon states to improve management of effects of climate change and variation.

Malawi also prepared a National Climate Change Policy to address climate change including adaptation to impacts thereof. The Policy seeks to ‘contribute to the attainment of sustainable development in line with Malawi’s national goals, as outlined in MGDS II and Vision 2020. Among others it will achieve this through better adaptation to climate change, with a focus on resilience building for Malawi’s citizens.

The aim of the National Climate Change Policy is to ‘create an environment for the development of a country-wide, coordinated and harmonized approach, which attends to the needs and concerns of all sectors of society, while ensuring continued sustainable development’. The Policy will guide actions that reduce community and ecosystem vulnerability through adaptation and harmonized approaches by different sectors and institutions towards building community and ecosystem

<sup>6</sup> Huq, S., A. Rahman, M. Konate, Y. Sokona and H. Reid (2003) *Mainstreaming Adaptation to Climate Change in Least Developed Countries (LDCs)*. London: International Institute for Environment and Development, 40 pp.; and Agrawala, S. and M. van Aalst (2005) Bridging the gap between climate change and development. *Bridge over Troubled Waters—Linking Climate Change and Development*, S. Agrawala (ed.). Paris: Organisation for Economic Cooperation and Development, pp. 133–146;

<sup>7</sup> UNFCCC, 2007: *Investment and Financial Flows to Address Climate Change*. United Nations Framework Convention on Climate Change Secretariat, Bonn, Germany, 270 pp.

resilience to climate change. It is clear therefore that Malawi's policies addressing adaptation needs must focus on actions that contribute to sustainable development in general and reduce vulnerability of the groups that are least able to adapt.

## 2.3 Assessment of Main Vulnerabilities

### 2.3.1 Vulnerable Groups in Urgent Need of Adaptation

In Malawi, the groups that are most vulnerable to climate risks are those that directly depend upon natural resources for their livelihood. Rural communities, women, children, elderly people and the physically challenged are the most affected and deemed to be vulnerable to climatic risks. The main vulnerable groups are:

- (a) *Subsistence farmers*: These are mostly rural populations who essentially practice small-scale rain-fed agriculture. Subsistence rain-fed farming is particularly vulnerable to climatic hazards due to the low adaptive capacity and practices that are increasingly incompatible with climatic variability. Women are also more vulnerable, as they comprise majority of the subsistence farmers. This results in additional vulnerability and adaptive constraints. Small-scale irrigation farmers are also vulnerable because decreased rainfall and drought reduce the availability of irrigation water thus affecting productivity. Flooding and droughts also destroys wells and other irrigation infrastructure;
- (b) *Urban poor*: The urban poor are vulnerable mainly because they lack access to land housing and sanitation; they often reside in the fringes and marginal areas that pose considerable climate risk. Price increases of commodities in local markets, incidents of diseases burden such as acute respiratory infections, shortage of water both in quantity and quality due to limited access to portable water, are exacerbated by climate variability; and
- (c) *Fishermen*: Artisanal fisheries are vulnerable to droughts and flooding and from erosion and sedimentation of breeding sites for fisheries. In addition, increased temperatures coupled with increased rainfall variability are affecting lake levels, circulation patterns, water chemistry, stream flows and siltation. These effects of climate change are mounting threats on freshwater ecosystems leading to decline in catch per unit efforts. The artisanal fisheries are the ones significantly affected because of their levels of technology and overreliance on fisheries for their livelihoods.

### 2.3.2 Vulnerable Sectors in Urgent Need of Adaptation

The vulnerable sectors in urgent need of adaptation have been provided below. This is not in priority order.

#### 2.3.2.1 Agricultural Sector

Climate change affects agriculture in various ways. Over reliance on rain fed systems, unpredictable weather and extreme occurrences such as floods and droughts are the main problems in agriculture. Agriculture sector is affected with erratic and unpredictable rainfall. Unpredictability of seasonality, climate variability and erosion of the natural resources base has considerable negative impacts on agriculture productivity. For instance as result of the floods and prolonged dry spells in the

2014/2015 farming season, Malawi registered a drop in maize production from 3.9 million metric tonnes to 2.8 million metric tonnes.

Climate change is also likely to further reduce grazing areas due to droughts and this will generate conflicts between livestock keeping and farming communities. In addition, an increase in temperature leads to soil chemical reaction and to increased soil decomposition, which releases greenhouse gases into the atmosphere. This may have both positive and negative consequences for farming communities. For example, while increased carbon dioxide levels may improve rice and wheat production, its impact on maize, sorghum and millet is negative.

### **2.3.2.2 Human Health Sector**

The main environmental conditions identified to be affecting human health are increased temperature, floods and drought which have the likelihood of affecting the magnitude and distribution of major killer diseases such as malaria, diarrhea and cholera. Malaria transmission and distribution increases in warmer temperatures because the anopheles mosquitoes thrive in such conditions. This therefore increases the burden to households and government through caring for the sick and an increased health budget. Rainfall also exerts pressure on human health in that erratic rainfall results in low agricultural production which leads to hunger and malnutrition.

### **2.3.2.3 Energy Sector**

Electricity generation greatly depends on hydro-generation which is vulnerable to floods and droughts especially along the Shire River Basin, where the generation activities are concentrated. Other pressures to energy sector are run-off and siltation resulting from deforestation and increased poor agricultural practices. All these have a bearing on commercial and industrial sectors as energy generation is greatly affected currently providing access to only 10% of the population. Reliance on biomass and the inadequate coverage of electricity, results in women and girls, walking long distances to collect firewood.

### **2.3.2.4 Fisheries Sector**

Fisheries sector depends on fresh water resources which are vulnerable to climatic changes and weather conditions. Inland fresh water bodies in Malawi are surrounded by land and are therefore legitimate sinks of run-off and other pollutants. As a result, habitats for fish and other aquatic organisms are affected resulting in ecosystem disturbance and reduced supply of food. Changes in climate as witnessed by floods, droughts and wind patterns have led to reduced catches, changes in species composition, disturbed food web and degraded aquatic environment. There have been declining annual fish production of value fish species, mainly Chambo (*Oreochromis spp*) from 10,000 metric tonnes in the 1980s to less than 4,000 metric tonnes in 2013. There has also been reduced per capita fish consumption from 9.4 kilogrammes in 1980 to 5.4 kilogrammes in 2008.

### **2.3.2.5 Wildlife Sector**

The key environmental issues affecting wildlife, especially in protected areas, are destruction of wildlife habitats and disruption of ecosystems. Global warming is the main climatic phenomenon and driving force as it may cause forest fire and also affect rainfall patterns which in turn result in habitat destruction and disturbances to food cycles.

### 2.3.2.6 Water Sector

Two main distinct issues pertaining to water are its quantity and quality. The extreme situations are when there is too much which results in floods and when there is too little resulting in drought. Quality is also of importance and has a bearing on the health and sustenance of ecosystems. Lack of flood zone mapping and delineation as well as early warning system was reported to be the main problem in the water sector. The result is that water resources and resource planning is affected as well as water related infrastructure and services.

Over the last three decades some water balance models that have been done on Lake Malawi have shown that the water levels have dropped from 477 metres above sea level in the 1980s to around 474.88 metres. There have also been drops in the middle Shire River of over 370 metres in elevation due to changes in rainfall patterns.

### 2.3.2.7 Forestry Sector

The main climatic hazards threatening the forestry sector are mean annual increase in temperature (between 3.0 and 3.6°C) and changes in precipitation (either decrease or increase depending on the altitude) and loss of wood production and the forests themselves. In addition, forest fires that result in destruction of natural resources and habitats are also affecting the forestry sector. Impact of forest loss on land use and climate change includes reduced carbon sequestration potential. Malawi's forest cover loss is estimated at 2.3% per annum.

### 2.3.2.8 Gender

Women, girls, the elderly, chronically sick among others are burdened as a result of loss of natural resources within or near their homestead. For instance, when there are no forests and/or water resources nearby, women have to walk longer distances to fetch these resources. In most cases they fetch these needed resources under very difficult circumstances. Although, most of the climate change impacts are common to all communities, the absence of specific gender disaggregated statistics still makes it hard to undertake comprehensive gender analysis of specific impacts of climate change. Women because of their roles are more dependent on natural resources as such they are more vulnerable to the effects of climate change.

### 2.3.2.9 Infrastructure development sector

The infrastructure development sector has been affected because of unstable environmental and climatic conditions; particularly floods and droughts. Floods damage property and infrastructure such as roads and buildings. On the other hand droughts and prolonged dry spells result in underperformance of irrigation infrastructure. This has ripple effects of decrease in agricultural productivity and agricultural products may also not be taken to markets due to inaccessible roads.

## 2.4 Potential Barriers to Implementation

Malawi faces numerous challenges and barriers to implement urgent and immediate adaptation activities identified by the NAPA process. Some of the major barriers that need to be dealt with are summarized as follows:

- (a) *Institutional coordination*: Institutional coordination is lacking in the implementation of development projects and environment and natural resources management policies including those related to climate change. Through the NSCCC and NTCCC, Government-Donor Working Group on Climate Change, and Development Partners Coordination Committee on Climate Change, efforts have been made in enhancing coordination, however improvements are still required to minimize duplication and strengthen efficiency;
- (b) *Limited understanding of institutional mandates*: There is limited understanding of mandates and responsibilities among stakeholders in climate change management as a result there is duplication and overlap of activities. The development of the National Climate Change Policy will contribute towards resolving this challenge;
- (c) *Capacity*: There is a chronic shortage of human resources and skills essential for the implementation of potential adaptation initiatives; in particular, there is limited field experience in translating policy statements into actions on the ground;
- (d) *Micro policy gaps at district level*: While Malawi has macro policies in place in a number of sectors, there is clear a gap between these micro policies at district levels for the various socio-economic sectors. Where district micro policies are in place, they have gaps that inhibit effective action toward sustainable development; and
- (e) *Financing*: There is concern that inadequate financing both at the international and national levels may limit the implementation of the urgent and immediate actions that adaptation plans require. In particular, Malawi like many developing countries who have limited technical skills and human resources has not been able to mobilize enough finances to levels that can finance implementation of adaptation actions agreed under NAPA. Most of the financing options available lean towards mitigation. There is limited financing for adaptation posing challenges to implementation of NAPA.

## 3.0 Identification of Key Adaptation Needs

### 3.1 Need for Adaptation

Malawi is highly vulnerable to the impacts of climate change, particularly as it relates to agriculture and rural livelihoods. Malawi's vulnerability arises from significant exposure to current climate variability; the high sensitivity of agriculture and rural livelihoods to these climatic changes; and very low adaptive capacity at the community and national levels. Adaptation is the adjustments that society or ecosystems make to limit negative effects of climate change. It can also include taking advantage of opportunities that a changing climate provides.

Throughout history, human societies have repeatedly demonstrated a strong capacity for adapting to different climates and environmental changes, whether by migration to new areas, crop diversification, or building different types of shelter (Adger et al., 2007). However, the current rate of global climate change is unusually high compared to past changes that society has experienced. In an increasingly interdependent world, negative effects of climate change on one population or economic sector can have repercussions around the world (USGCRP, 2009).

Many communities that are vulnerable to climate change impacts have been dealing with climate variability for decades and have a wealth of knowledge about how to adapt. The NAPA serves to compliment the community-based adaptation to climate change and facilitate proper adaptation strategies to different types and magnitudes of climate change impacts throughout the country. The focus is on empowering communities to use their own knowledge and decision-making processes to take action.

### 3.2 Key Adaptation Needs

- (a) Agriculture and food security: serves as a key adaptation need as climate change effects continue to reduce food availability through affecting production. Interventions such as development of climate smart agriculture programmes, crop and livestock diversification, introduction of reliable early warning systems, promoting irrigated farming systems, research into sustainable agriculture practices would be ideal to address the impacts of climate change in the agricultural sector;
- (b) Human Health: due to wide spreading of diseases that result from or are intensified by climate change effects. Moreover population dynamics is also impacting on climate change significantly. Interventions such as development of drought tolerant varieties, intensified irrigation systems and crop and animal diversification could reverse the current situation in relation to nutrition;
- (c) Energy: due to high dependency on biomass and hydroelectric power. To address this, interventions such as use of energy saving technologies, encouraging rural electrification, introduction of mini community hydroelectric plants, river bank protection, reforestation and afforestation would be ideal;
- (d) Fisheries: as a major source of protein which is slowly being depleted due to unbalanced demand. Integrated catchment conservation, stream bank protection and household fish

production using own ponds would possibly address the adaptation needs of the fisheries sector;

- (e) Wildlife: climate change effects have resulted in reduced natural resources to maintain wildlife. The wildlife sector has been neglected in Malawi, with protected areas suffering from encroachment and destruction of important species habitats. Therefore rehabilitation of protected areas and promoting co-management approaches of wildlife protected areas would bring back the lost natural resources;
- (f) Water: potable water and access to it, still remains a problem in Malawi due to erratic rainfall patterns, dry spells and unsustainable management of catchment areas. Introducing programmes on integrated catchment conservation and management and integrated water resource management would address some of the adaptation needs;
- (g) Forestry: the country continues to face higher levels of deforestation, which is amongst the highest in the region. Deforestation also links to enhancing risks and vulnerability to flooding. To address adaptation needs in the forestry sector, interventions such as reforestation, natural woodland regeneration, promoting truncheons and watershed management programme development and implementation should be promoted;
- (h) Gender: both men and women are being impacted differently by effects of climate change, which must be considered across all interventions. Issues of control and access to resources are also important for consideration. The gender adaptation needs would be addressed if all interventions integrate gender, specifically considering women and youth involvement in climate change adaptation; and
- (i) Infrastructure: affected by unstable environmental and related climatic disasters such as floods and strong winds. Introduction of standards for regulation of built environment, introduction of green cities town planning that integrates climate change adaptation and disaster preparedness would address the adaptation needs for this sector.

In addition, some of the long term adaptation options were provided as input into the National Adaptation Planning process.

## 4.0 Criteria for Selecting Priority Activities

### 4.1 Selecting Priority Activities

Criteria that has been used to select priority adaptation activities was based on the generic criteria as proposed by the Least Developed Countries Expert Group (LEG) and outlined in the Annotated Guidelines for the Preparation of NAPA (UNFCCC, 2002). The criteria were also discussed with stakeholders during the national stakeholder consultation workshop. The list of criteria, arranged in descending order of priority, is as follows:

- (a) Technical feasibility;
- (b) Economic growth (income levels of communities or target groups);
- (c) Synergies (with ongoing policies, programmes and multilateral environmental agreements);
- (d) Magnitude of impact of the option on vulnerable groups;
- (e) Cost of the project;
- (f) Stakeholder level of participation;
- (g) Losses that can be avoided by vulnerable communities upon introducing the option;
- (h) Livelihood sustainability; and
- (i) Cross-cutting issues.

Each adaptation option was scored based on a scale of 1 (very low); 2 (low); 3 (medium); 4 (high); and 5 (very high), against each criterion. The scoring process is outlined below.

### 4.2 Methodology for Scoring an Option against a Criterion

The methodology for scoring options against the criteria was in line with the guidelines provided by UNFCCC, United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP) and the United Nations Institute of Training and Research (UNITAR). Multi-Criteria Analysis (MCA) was done on the proposed adaptation options.

A total of 53 adaptation options were proposed from the nine sectors during the consultations on stock-taking of status of implementation and review of the NAPA. As a first step in the prioritization process, stakeholders at the national consultative workshop were asked to prioritize all the adaptation options per sector resulting in 26 adaptation options. A follow up visit was also made to respective sectors to ascertain the scores. The raw scores per sector have been provided in Annex I (sectoral adaptation options). The 26 adaptation options have been presented in Annex II. The list of stakeholders that participated in the national consultation workshop has been provided in the Findings Report.

### 4.3 Standardization of Scores

The scores in Annex II were then standardized by removing scores that had two respondents each. For each adaptation option a total score was obtained by summing up all the scores on each respective row. Based on the total sum values the options were ranked as shown in Annex II. After this process a total of 20 adaptation options were identified. These have been provided in Annex III.



## 4.4 Weighting of Criteria

The list of 20 adaptation options was rationalized further with the five adaptation options identified under gender and infrastructure being taken as cross cutting that must be considered under each adaptation option. The final results produced 15 adaptation options that are presented in Table 1, below.

## 5.0 List of Priority Activities

### 5.1 Adaptation Options

The 15 adaptation options have been provided in Table 1, below.

**Table 1: Adaptation Options**

Rank	Sector	Adaptation option	Criteria									Totals
			(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
1	Agriculture	Introduction of early warning systems	4.25	5.00	4.50	5.00	4.50	4.33	4.75	4.50	4.75	41.58
2		Development of climate smart agriculture programmes	4.25	4.25	4.75	4.75	4.50	5.00	3.75	4.25	4.00	39.50
3		Promoting irrigated farming systems	5.00	5.00	5.00	4.75	4.50	4.75	2.50	4.25	3.75	39.50
4	Forestry	Watershed management	5.00	4.17	4.33	4.67	4.00	4.33	4.33	4.50	3.67	39.00
5		Reforestation	4.57	3.71	4.43	4.43	4.14	4.43	4.14	4.71	3.71	38.29
6	Fisheries	Encourage better farming practices and environmental management	4.00	4.00	4.33	4.33	4.00	4.33	4.50	4.83	3.83	38.17
7		Integrating climate change into fisheries management	4.50	4.50	4.33	3.83	3.67	3.83	4.33	4.50	3.67	37.17
8		Focus on crop and livestock farming	4.33	4.17	4.00	4.33	4.33	4.00	3.67	4.17	3.33	36.33
9	Energy	Encourage rural electrification	4.20	4.20	4.20	4.20	3.80	3.60	4.00	4.00	4.00	36.20
10	Forestry	Natural woodland regeneration	4.14	3.57	4.29	4.14	4.29	3.86	3.71	4.29	3.00	35.29
11	Water	Integrated water resource management	4.00	3.71	3.86	4.00	3.71	4.43	3.86	3.83	3.67	35.07
12	Energy	River bank protection	4.33	3.67	4.00	4.33	3.17	4.67	3.67	3.50	3.67	35.00
13		Reforestation	3.83	3.17	4.17	3.83	3.67	4.33	4.00	4.00	4.00	35.00
14	Water	Integrated catchment conservation and management	4.43	3.43	4.00	3.57	3.43	4.00	4.00	3.67	4.17	34.69
15		Establishment of water resources development and management schemes	3.86	3.86	3.71	4.14	3.86	3.86	3.57	4.00	3.67	34.52

## Identification of priority activities for urgent and immediate adaptation

Based on the 15 adaptation options, six urgent activities have been identified. The six priority adaptation activities are as follows:

- (a) Improving existing early warning systems to enhance disaster preparedness and response;
- (b) Development of climate smart agriculture programmes to increase resilience;
- (c) Improving integrated water resource management to sustain agricultural production;
- (d) Restoring forests in all degraded areas across the country to increase forest cover and to reduce energy related problems;
- (e) Improving rural electrification to increase energy access in rural areas; and
- (f) Integrating climate change into fisheries management to ensure sustainability of the fisheries sector.

The six priority adaptation activities were developed into project concepts. These project concepts are briefly described below:

### (a) Improving existing early warning systems to enhance disaster preparedness and response

Malawi continues to experience disasters every year. For instance in the season of 2014/15, the country faced huge disasters of floods and strong winds in selected districts such that more than 230,000 people were displaced, 104 deaths and 63,976 hectares of land destroyed. However, the government and other stakeholders are implementing various programmes on preparedness through early warning systems interventions. Some of these interventions include hazard mapping, awareness, telephone messaging (ESOKO), contingency planning and use of indigenous knowledge. Regardless of these efforts the effects of disasters are detrimental as most communities are not exposed to early warning messages.

There is need for multi-sectoral approach to improve uptake of early warning messages. United Nations Development Programme through the Department of Disaster Management Affairs, Enhancing Community Resilience Programme, COOPI, Catholic Development Commission of Malawi and Department of Climate Change and Meteorological Services among others have various programmes related to early warning systems hence the need to improve preparedness of communities against the disasters.

**Objective:** The objective of this project is to improve existing early warning systems to enhance preparedness of vulnerable communities to effects of climate change. Stakeholders proposed the following activities to achieve this objective:

- Introduction of user friendly early warning system;
- Participatory vulnerability and capacity assessment;
- Dissemination of weather forecast;
- Integrate indigenous knowledge into the scientific climate and weather forecasting and any related information;
- Conduct participatory scenario planning where communities and extension staff interpret climate and weather information into scenarios and how they can be prepared;
- Monitoring implementation; and
- Sharing of best practices with stakeholders.

The implementation of this project will be led by Department of Climate Change and Meteorological Services.

## (b) Development of climate smart agriculture programmes to increase resilience

As earlier emphasized, Malawi is an agro-based economy with agriculture accounting for about 40% of the Gross Domestic Product and 90% of Malawi's export earnings. The majority of Malawi's population lives in rural areas and generating their food and livelihood from subsistence agriculture. Key problems facing agriculture and food security in Malawi include low productivity, unsustainable land use and farming practices, loss of crop biodiversity, heavy dependency on rain-fed systems, high levels of vulnerability to impacts of climate change, and severe environment and natural resources degradation.

Agriculture is among the sectors heavily affected by climate change effects especially with intense rainfall and droughts which reduces food availability. To address these effects stakeholders have employed various climate change adaptation initiatives including Climate Smart Agriculture (CSA). In particular, conservation agriculture, agro forestry, small scale irrigation and other technologies that reduce vulnerability to moisture stress, extended dry spells and localised flooding and build resilience have been introduced.

The development of CSA programmes in the second edition of NAPA will increase resilience of communities and other systems.

**Objective:** The objective of this project is to increase resilience of communities through development of CSA programmes. To achieve this project, the proposed interventions are:

- Promoting irrigated farming systems;
- Promote sustainable farming practices is agroforestry one of these? May relevant; and
- Diversifying crop and livestock farming to reduce pressure on fisheries

Ministry of Agriculture, Irrigation and Water Development specifically Department of Land Resources Conservation will be the lead agency in implementing this project.

## (c) Improving integrated water resource management to sustain agricultural production

Climate change effects especially droughts have resulted in water stresses to support agriculture production among other requirements. The water sector has faced huge challenges and this has affected agriculture production especially the staple food maize resulting in food insecurity. GoM (2005) in their thematic report indicated that the periods of droughts or low rainfall and high rainfall have caused water scarcity and floods respectively, throughout the country. Areas like Lower Shire Valley, Karonga North and Nkhotakota-Salima lakeshore appear to be particularly vulnerable to floods while Lower Shire, Upper Shire area, Southern Karonga and Bwanje Valley receive the lowest rainfall and are most vulnerable to droughts and their effects.

Water stresses due to climate change effects have forced people to practice agriculture in fragile areas such as wetlands and river banks among others to take advantage of residue moisture. Farming in fragile areas has resulted in degradation of such areas and currently very few fragile areas are still viable for productivity.

**Objective:** The objective of this project is to improve water availability through improved integrated water resource management. To achieve this objective, the following activities are proposed:

- Promoting river bank protection;
- Improving watershed management;

- Promoting wetland catchment management; and
- Establishment of water resources development and management schemes
- May also consider sustainable irrigation techniques and water harvesting technologies

The Department of Water Development and Irrigation would be the lead agency in implementing this project.

**(d) Restoring forests in all degraded areas across the country to increase forest cover and to reduce energy related problems**

Malawi is facing acute deforestation largely due to unsustainable exploitation of forest resources and clearing of land for cultivation. The rate of deforestation, one of the highest in Africa, is estimated at 2.8% annually. About 41% of forest cover is estimated to have been lost between 1972 and 1994<sup>8</sup>. The Ministry of Natural Resources reports in the Forestry Policy<sup>9</sup> that 90% of energy requirements in Malawi are met from wood-fuels derived from natural and planted forests and trees planted on farm or surroundings. The rural population, which makes about 85% of the total population, depend entirely on forests and trees for their fuel-wood, timber, poles and traditional medicine.

The major source of energy at household level is fuel wood. 91% of rural people use three-stone cooking system. Due to high levels of deforestation, fuel wood is scarce and women have to travel long distances to collect firewood for cooking. Deforestation is in turn making rural livelihoods more vulnerable to effects of climate change such that degraded catchments are more likely to trigger larger floods, as well as having a direct impact on microclimates and intensifying drought and dry spells.

In addition, the high dependency on agriculture for exports and livelihoods, in Malawi, has created significant pressure on forest resources, especially those on customary land. This pressure together with heavy reliance on biomass energy has significantly contributed to land degradation.

**Objective:** The objective of this project is to increase forest cover and reduce energy related problems in Malawi. To achieve this objective the following activities are proposed:

- Promoting reforestation initiatives; and
- Encourage natural woodland regeneration.
- May also consider promotion of sustainable alternative energy sources to lessen pressure on forest resources.

The Department of Forestry in the Ministry of Natural Resources, Energy and Mining would be the lead agency in implementing this project.

**(e) Improving rural electrification to increase energy access in rural areas**

Only 10% of the entire Malawi population is connected to electricity on the national grid. The situation is worse in rural areas. The major rural energy needs are primarily for lighting, supporting small and medium enterprises to diversify livelihoods and increase rural resilience. Increasing energy access in rural areas would enhance climate change adaptation as the communities would

<sup>8</sup> Alden, L & Mbaya, S (2001) *Land, People and Forests in eastern and southern Africa at the beginning of the 21<sup>st</sup> Century: The impact of land relations on the role of communities in the forest future* (Nairobi, IUCN-EARO);  
<sup>9</sup> GoM, 1996: Ministry of Natural Resources, National Forestry Policy of Malawi;

use the electricity for irrigation and food processing. This could be done primarily through extension of the rural electrification programme to areas with irrigation potential. In addition, areas of high production of agricultural products that would benefit from value addition through processing should also be considered for rural electrification programmes. This would ease connectivity access.

**Objective:** The objective of this project is to increase hydro energy access in rural areas. To achieve this objective the proposed intervention is:

- Extension of rural electrification programme

The Energy Affairs Department in the Ministry of Natural Resources, Energy and Mining would be the lead agency in implementing this project.

#### **(f) Integrating climate change into fisheries management to ensure sustainability of the fisheries sector**

Over the last three decades Malawi has experienced a number of adverse climatic hazards. The most serious ones include unpredictable rainfall, dry spells and droughts. These have adversely affected water quality and quantity. Water bodies such as shallow lakes, rivers, streams and ponds dry up and groundwater levels decrease. Water levels and surface areas of one of the large shallow lakes in Malawi, Lake Chilwa, fluctuate with rainfall anomalies (Jul-Larson et al, 2003). These climatic and hydrological fluctuations are mirrored by changes in fishing activity and catches (Allison and Mvula, 2002).

**Objective:** The objective of this project is to increase adoption of climate change adaptation measures that support resilience of fishing communities and freshwater ecosystems. Stakeholders proposed the following activities to achieve this objective:

- Studies on effects of climate change on fisheries ecosystems;
- Studies on adaptation options for fishing communities; and
- Promotion of fisheries ecosystem based adaptation options Is promotion of aquaculture under this?.

The Department of Fisheries in the Ministry of Agriculture, Irrigation and Water Development would be the lead agency in implementing this project.

## **5.2 Implementation Strategy**

The six priority adaptation activities have been developed into project profiles, highlighting the rationale, objectives, inputs, short-term outputs, potential long-term outcomes and institutional arrangements, risks and barriers, and a proposed implementation budget. These project profiles have been presented in an implementation plan for each project profile in form of a matrix. The implementation plan needs to be read together with the second edition of NAPA document and the M&E plan.

## **5.3 Monitoring and Evaluation**

The purpose of M&E is to assess progress, keep track and implement correctional measures to fulfill the NAPA implementation plan. Elements of the M&E plan include indicators, targets, means of verification and assumptions have been provided under a separate cover. Lead agencies have also been provided for each priority adaptation activity.

## 6.0 NAPA Preparation Process

### 6.1 The Consultative Process

In reviewing the first edition of NAPA, a number of consultations were undertaken. Initially to have a common understanding of the stocktaking of status of implementation of the first edition of NAPA and preparation of revised NAPA a meeting with the secretariat (Environmental Affairs Department) was organized where the plan was developed and terms of reference were agreed upon.

To gather information from stakeholders, a questionnaire was developed to obtain information on stakeholders areas on expertise and programming, extent of the first edition of NAPA implementation, knowledge on the current NAPA, investment on the current NAPA, challenges in the implementation of NAPA, priority areas that need to be reconsidered in the revised NAPA, sectors to be considered in the revised NAPA and priority areas to be considered to address medium and long term adaptation needs through the NAPs. Various stakeholders from public, private sector, academia, civil society, non-governmental organizations, faith-based, research-based organizations, media and youth were consulted. Input from rural communities was solicited through nongovernmental organizations working in the respective areas. The details for the stakeholders consulted are provided in the Findings Report.

Supplementary inputs and feedback were solicited from stakeholders through consultative workshops which were organized by the secretariat and Civil Society Network on Climate Change (CISONECC). The Findings Report was presented to stakeholders in different fora such as National Technical Committee on Climate Change, CISONECC and national stakeholder consultative workshop.

The final list of adaptation options was established through a prioritization process using MCA. The prioritization was conducted using three approaches namely, the national consultative workshop, individual interviews to selected stakeholders representing all the nine sectors and MCA software. The prioritization followed the following criteria; technical feasibility; economic growth (income levels of communities or target groups); synergies (with ongoing policies, programmes and multilateral environmental agreements); magnitude of impact of the option on vulnerable groups; cost of the project; stakeholder level of participation; losses that can be avoided by vulnerable communities upon introducing the option; livelihood sustainability; and cross-cutting issues.

### 6.2 Country Driveness

Climate change has been one of the prioritized sectors considering that its effects have been on the increase. Over the past decades the country has been facing increased climate variations. This is being experienced in the form of prolonged dry spells, droughts, intense rainfall, floods and temperature variability. This has negatively affected the performance of various sectors such as agriculture, forestry, water and irrigation, energy, infrastructure, manufacturing, transport, tourism, and trade, among others (GoM 2011). This prompted GoM to prioritize Climate Change, Natural Resources and Environmental Management amongst the nine priorities in its medium term economic development plans, MDGS II. Furthermore the country has been facing climate change related disasters that have escalated with time. This also led to commitment and prioritization of disaster under theme three (social support and disaster risk management) of MGDS II.

Malawi signed the UNFCCC in 1992 and ratified it in 1994. In fulfillment of its obligations under the Convention, Malawi has completed and submitted a number of adaptation related reports to the UNFCCC. To this end Malawi developed its first edition of NAPA in 2008 which was one of the CoP decisions adopted at the Seventh Conference of the Parties (CoP7) that was held in Marrakesh, Morocco in 2001. Government continues to demonstrate its commitment to addressing climate change in revising the current NAPA. Moreover, GoM has also initiated development of a number of instruments and designated institutions for climate change adaptation processes. These include rolling out the NAP process, development of Nationally Appropriate Mitigation Actions, accreditation of a National Implementing Entity and National Designated Entity for the Adaptation Fund and Green Climate Fund respectively.

In addition, GoM recently approved the National Disaster Risk Management Policy and National Climate Change Policy. Development of a National Meteorology Policy is also underway. All these developments demonstrate the level of GoM commitment to addressing climate change.

### **6.3 Contribution to Overall Sustainable Development Goals, Objectives and Strategies**

Malawi developed MGDS II as an overarching medium term strategy for Malawi to attain its long term aspiration as spelt out in Vision 2020. The strategy covers a period of five years from 2011 to 2016. The strategy seeks to continue reducing poverty through sustainable economic growth and infrastructure development. The MGDS II also contributes to overall Millennium Development Goals which are aimed at creating an enabling environment that will facilitate socioeconomic development and the promotion of human rights in member countries. The projects identified in the second edition of NAPA will therefore address urgent and short-term adaptation needs in nine sectors. In addition, the revised NAPA will also contribute towards Sustainable Development Goal Number 17.

### **6.4 Government's Endorsement and Commitment**

The second edition of NAPA seeks to address Malawi's urgent and immediate adaptation needs to climate change and extreme weather events for vulnerable communities and areas of Malawi. This document has been endorsed by the Minister of Natural Resources, Energy and Mining. This has been possible because members of the National Technical Committee on Climate Change and the National Steering Committee on Climate Change were fully involved during the process.

### **6.5 Transparency**

It is hoped that the open and transparent consultative approach used in formulating the second edition of NAPA, as portrayed in country drivenness of the process, has ensured that all aspirations be included in the second edition of NAPA. The second edition of NAPA will be effectively implemented and adopted by all stakeholders. The approach has also assisted in identifying the challenges that the first edition of NAPA faced especially on knowledge gap and implementation.



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# Annexes

## Annex I: Sectoral Adaptation Options

### Agriculture Sector

Adaptation options	Criteria									Total
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Introduction of reliable early warning systems	4.25	5.00	4.50	5.00	4.50	4.33	4.75	4.50	4.75	41.58
Development of climate smart agriculture programmes	4.25	4.25	4.75	4.75	4.50	5.00	3.75	4.25	4.00	39.50
Promoting irrigated farming system	5.00	5.00	5.00	4.75	4.50	4.75	2.50	4.25	3.75	39.50
Crop diversification	4.50	4.25	4.25	4.50	4.00	4.25	2.25	4.00	3.75	35.75
Research into sustainable agriculture practices	3.75	3.75	4.50	4.25	3.75	4.25	3.00	4.00	4.25	35.50
Livestock diversification	4.00	4.25	4.50	4.25	4.00	3.50	2.25	4.00	3.75	34.50
Food processing technologies	3.75	4.75	4.00	3.50	3.25	3.50	2.75	4.50	4.50	34.50
Development of food and seed storage systems	4.25	3.75	3.75	3.50	3.00	3.25	2.75	4.00	4.25	32.50

### Human Health and Nutrition

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Intensified irrigation system	5.00	3.50	3.50	2.50	4.50	2.50	2.50	4.50	3.00	31.50
Crop diversification	3.50	3.50	3.50	3.50	3.00	4.00	3.00	2.00	2.00	28.00
Livestock diversification	3.00	3.50	3.00	4.00	3.00	3.50	2.50	2.50	2.50	27.50
Development of drought tolerant varieties	3.00	2.50	3.50	3.50	3.00	4.00	2.00	2.00	2.50	26.00
Family planning to reduce population growth	3.50	2.50	3.00	3.00	3.50	2.50	2.00	2.50	2.50	25.00
Distribution of insect treated nets	2.00	2.00	3.00	3.50	2.00	4.00	2.50	2.00	2.50	23.50
Development of low cost food supplements for junior school children	2.50	1.50	3.00	2.50	3.00	2.00	1.50	3.50	3.00	22.50

### Energy Sector

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Encourage rural electrification	4.20	4.20	4.20	4.20	3.80	3.60	4.00	4.00	4.00	36.20
River bank protection	4.33	3.67	4.00	4.33	3.17	4.67	3.67	3.50	3.67	35.00
Reforestation	3.83	3.17	4.17	3.83	3.67	4.33	4.00	4.00	4.00	35.00
Use of solar energy	3.75	4.00	4.00	4.00	3.50	3.75	4.25	4.00	3.50	34.75
Afforestation	4.50	3.83	3.83	3.50	4.00	4.33	3.33	3.83	3.50	34.67
Introduction of mini community hydroelectric plants	4.67	4.33	3.67	4.00	3.33	3.67	4.00	4.00	3.00	34.67
Co-management of forestry resources	3.40	4.00	3.80	3.60	3.20	4.20	4.00	4.20	3.60	34.00
Use of energy saving technologies	3.83	3.33	3.67	3.17	2.83	3.83	3.83	3.17	3.33	31.00
Biogas energy generation	4.00	3.67	3.00	3.00	2.67	4.00	3.67	3.67	3.00	30.67
Utilizing regional energy supply from the SADC region	4.20	3.20	3.40	3.00	2.60	2.80	3.20	3.20	3.20	28.80
Use of generators	3.40	3.40	3.20	2.60	2.40	2.60	3.20	3.00	3.00	26.80
Use of crop residues	2.80	2.40	2.60	2.60	2.40	3.80	2.60	3.00	2.60	24.80

## Fisheries Sector

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Encourage better farming practices and environmental management	4.00	4.00	4.33	4.33	4.00	4.33	4.50	4.83	3.83	38.17
Integrating climate change into fisheries management	4.50	4.50	4.33	3.83	3.67	3.83	4.33	4.50	3.67	37.17
Focus on crop and livestock farming	4.33	4.17	4.00	4.33	4.33	4.00	3.67	4.17	3.33	36.33
Integrated catchment conservation	4.17	3.83	4.17	3.83	4.00	4.17	4.17	4.50	3.33	36.17
Civic education	3.83	3.17	3.50	4.17	3.83	4.17	3.83	3.33	3.83	33.67
Stream bank protection	3.83	3.33	3.67	3.67	3.83	3.83	3.83	4.17	3.00	33.17
Promotion of household fish ponds	3.83	3.67	3.17	3.83	3.00	3.50	3.00	3.50	2.83	30.33
Relocation	2.67	2.50	2.83	3.67	3.00	3.17	4.00	3.17	3.67	28.67

## Wildlife Sector

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Promotion of co-management approaches of the wildlife protected areas	5.00	4.50	4.50	4.50	4.00	4.50	4.50	4.50	3.50	39.50
Community based wildlife ranching	5.00	5.00	4.00	4.00	4.50	4.50	4.00	4.50	3.50	39.00
Rehabilitation of protected areas	4.50	3.50	3.50	3.50	4.50	4.00	3.50	3.50	4.00	34.50

## Water Sector

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Integrated water resource management	4.00	3.71	3.86	4.00	3.71	4.43	3.86	3.83	3.67	35.07
Integrated catchment conservation and management	4.43	3.43	4.00	3.57	3.43	4.00	4.00	3.67	4.17	34.69
Establishment of water resources development and management schemes	3.86	3.86	3.71	4.14	3.86	3.86	3.57	4.00	3.67	34.52
Water harvesting	4.00	3.50	3.17	4.17	3.33	4.67	4.00	4.00	3.20	34.03
Formulation of national water resources master plan	4.14	3.00	3.86	3.29	3.43	4.29	3.57	3.00	3.33	31.90

## Forestry Sector

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Watershed management	5.00	4.17	4.33	4.67	4.00	4.33	4.33	4.50	3.67	39.00
Reforestation	4.57	3.71	4.43	4.43	4.14	4.43	4.14	4.71	3.71	38.29
Natural woodland regeneration	4.14	3.57	4.29	4.14	4.29	3.86	3.71	4.29	3.00	35.29
Promoting truncheons	3.43	2.71	3.57	3.29	3.29	3.14	3.00	3.00	2.71	28.14

## Gender and other vulnerable groups

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Women and youth involvement in climate change adaptation	3.67	2.67	3.67	3.33	3.33	4.33	4.00	3.33	3.33	<b>31.67</b>
Gender mainstreaming in climate change adaptation	3.67	1.67	3.33	2.33	3.00	3.67	3.67	3.00	4.00	<b>28.33</b>

## Infrastructure development

Adaptation options	Criteria									Totals
	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
Introduction of green cities town planning which integrates climate change adaptation and disaster preparedness	4.00	3.40	3.60	3.80	4.00	3.80	4.00	3.60	3.20	33.40
Technology transfer	4.60	3.60	3.40	3.20	3.60	4.20	3.80	3.20	2.60	32.20
Introduction of standards for regulation of built environment	4.00	2.40	3.60	3.60	4.40	3.80	3.80	3.00	3.40	32.00
Improved science, education and green technology	4.40	2.40	3.80	3.60	3.40	3.40	3.60	3.00	3.00	30.60

## Annex II: Adaptation Options

Rank	Adaptation options	Criteria									Totals
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
1	Introduction of reliable early warning systems	4.25	5.00	4.50	5.00	4.50	4.33	4.75	4.50	4.75	41.58
2	Development of climate smart agriculture programmes	4.25	4.25	4.75	4.75	4.50	5.00	3.75	4.25	4.00	39.50
3	Promotion of irrigated farming systems	5.00	5.00	5.00	4.75	4.50	4.75	2.50	4.25	3.75	39.50
4	Promotion of co-management approaches of the wildlife protected areas	5.00	4.50	4.50	4.50	4.00	4.50	4.50	4.50	3.50	39.50
5	Community based wildlife ranching	5.00	5.00	4.00	4.00	4.50	4.50	4.00	4.50	3.50	39.00
6	Watershed management	5.00	4.17	4.33	4.67	4.00	4.33	4.33	4.50	3.67	39.00
7	Reforestation	4.57	3.71	4.43	4.43	4.14	4.43	4.14	4.71	3.71	38.29
8	Encourage better farming practices and environmental management	4.00	4.00	4.33	4.33	4.00	4.33	4.50	4.83	3.83	38.17
9	Integrate climate change into fisheries management	4.50	4.50	4.33	3.83	3.67	3.83	4.33	4.50	3.67	37.17
10	Focus on crop and livestock farming	4.33	4.17	4.00	4.33	4.33	4.00	3.67	4.17	3.33	36.33
11	Encourage rural electrification	4.20	4.20	4.20	4.20	3.80	3.60	4.00	4.00	4.00	36.20
12	Natural woodland regeneration	4.14	3.57	4.29	4.14	4.29	3.86	3.71	4.29	3.00	35.29
13	Integrated water resources management	4.00	3.71	3.86	4.00	3.71	4.43	3.86	3.83	3.67	35.07
14	River bank protection	4.33	3.67	4.00	4.33	3.17	4.67	3.67	3.50	3.67	35.00
15	Reforestation	3.83	3.17	4.17	3.83	3.67	4.33	4.00	4.00	4.00	35.00
16	Integrated catchment conservation and management	4.43	3.43	4.00	3.57	3.43	4.00	4.00	3.67	4.17	34.69
17	Establishment of water resources development and management schemes	3.86	3.86	3.71	4.14	3.86	3.86	3.57	4.00	3.67	34.52
18	Rehabilitation of protected areas	4.50	3.50	3.50	3.50	4.50	4.00	3.50	3.50	4.00	34.50
19	Introduction of green cities town planning which integrates climate change adaptation and disaster preparedness	4.00	3.40	3.60	3.80	4.00	3.80	4.00	3.60	3.20	33.40
20	Technology transfer	4.60	3.60	3.40	3.20	3.60	4.20	3.80	3.20	2.60	32.20
21	Introduction of standards for regulation of built environment	4.00	2.40	3.60	3.60	4.40	3.80	3.80	3.00	3.40	32.00
22	Women and youth involvement in climate change adaptation	3.67	2.67	3.67	3.33	3.33	4.33	4.00	3.33	3.33	31.67
23	Intensified irrigation schemes	5.00	3.50	3.50	2.50	4.50	2.50	2.50	4.50	3.00	31.50
24	Gender mainstreaming in climate change adaptation	3.67	1.67	3.33	2.33	3.00	3.67	3.67	3.00	4.00	28.33
25	Crop diversification	3.50	3.50	3.50	3.50	3.00	4.00	3.00	2.00	2.00	28.00
26	Livestock diversification	3.00	3.50	3.00	4.00	3.00	3.50	2.50	2.50	2.50	27.50

## Annex III: Standardized Adaptation Options

Rank	Adaptation Options	Criteria									Totals
		(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	
1	Introduction of reliable early warning systems	4.25	5.00	4.50	5.00	4.50	4.33	4.75	4.50	4.75	41.58
2	Development of climate smart agriculture programmes	4.25	4.25	4.75	4.75	4.50	5.00	3.75	4.25	4.00	39.50
3	Promoting irrigated farming systems	5.00	5.00	5.00	4.75	4.50	4.75	2.50	4.25	3.75	39.50
4	Watershed management	5.00	4.17	4.33	4.67	4.00	4.33	4.33	4.50	3.67	39.00
5	Reforestation	4.57	3.71	4.43	4.43	4.14	4.43	4.14	4.71	3.71	38.29
6	Encourage better farming practices and environmental management	4.00	4.00	4.33	4.33	4.00	4.33	4.50	4.83	3.83	38.17
7	Integrating climate change into fisheries management	4.50	4.50	4.33	3.83	3.67	3.83	4.33	4.50	3.67	37.17
8	Focus on crop and livestock farming	4.33	4.17	4.00	4.33	4.33	4.00	3.67	4.17	3.33	36.33
9	Encourage rural electrification	4.20	4.20	4.20	4.20	3.80	3.60	4.00	4.00	4.00	36.20
10	Natural woodland regeneration	4.14	3.57	4.29	4.14	4.29	3.86	3.71	4.29	3.00	35.29
11	Integrated water resources management	4.00	3.71	3.86	4.00	3.71	4.43	3.86	3.83	3.67	35.07
12	River bank protection	4.33	3.67	4.00	4.33	3.17	4.67	3.67	3.50	3.67	35.00
13	Reforestation	3.83	3.17	4.17	3.83	3.67	4.33	4.00	4.00	4.00	35.00
14	Integrated catchment conservation and management	4.43	3.43	4.00	3.57	3.43	4.00	4.00	3.67	4.17	34.69
15	Establishment of water resources development and management schemes	3.86	3.86	3.71	4.14	3.86	3.86	3.57	4.00	3.67	34.52
16	Introduction of green cities town planning which integrates climate change adaptation and disaster preparedness	4.00	3.40	3.60	3.80	4.00	3.80	4.00	3.60	3.20	33.40
17	Technology transfer	4.60	3.60	3.40	3.20	3.60	4.20	3.80	3.20	2.60	32.20
18	Introduction of standards for regulation of built environment	4.00	2.40	3.60	3.60	4.40	3.80	3.80	3.00	3.40	32.00
19	Women and youth involvement in climate change adaptation	3.67	2.67	3.67	3.33	3.33	4.33	4.00	3.33	3.33	31.67
20	Gender mainstreaming in climate change adaptation	3.67	1.67	3.33	2.33	3.00	3.67	3.67	3.00	4.00	28.33













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