



FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
Environment, Forest and Climate Change Commission

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INTEGRATING THE CLIMATE-RESILIENT GREEN ECONOMY (CRGE) STRATEGY IN SECTOR DEVELOPMENT PLANS

Guideline for ministries and regional
CRGE implementing entities



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This updated guideline builds on the previous guideline developed by the Ministry of Environment and Forests in 2014. It was developed through the United States In-Country National Adaptation Plan (NAP) Support Program in Ethiopia which is implemented by the International Institute for Sustainable Development (IISD), host to the NAP Global Network Secretariat. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies or opinions of the NAP Global Network, its funders or Network participants.



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Table of Contents

1. INTRODUCTION	1
2. BACKGROUND INFORMATION	3
2.1 KEY CONCEPTS.....	3
2.2 CLIMATE CHANGE IN ETHIOPIA.....	4
2.3 CLIMATE CHANGE IMPACTS ON KEY SECTORS.....	6
3. POLICY CONTEXT	7
3.1 CLIMATE-RESILIENT GREEN ECONOMY STRATEGY.....	7
3.2 GROWTH AND TRANSFORMATION PLAN.....	7
3.3 NATIONALLY DETERMINED CONTRIBUTION.....	8
3.4 GREEN ECONOMY STRATEGY.....	8
3.5 NATIONAL ADAPTATION PLAN.....	10
4. APPROACH TO INTEGRATING THE CRGE STRATEGY IN PLANNING	11
5. GUIDANCE ON INTEGRATING THE CRGE STRATEGY IN SECTOR AND REGIONAL PLANNING	12
5.1 ROLES AND RESPONSIBILITIES.....	12
5.2 INTEGRATING CLIMATE CHANGE IN MEDIUM-TERM PLANS.....	14
5.3 INTEGRATING CLIMATE CHANGE IN ANNUAL PLANS.....	22
REFERENCES	23
ANNEX 1: Adaptation Options for Building Climate Resilience in Sectors	25
ANNEX 2: Cross-Cutting Options That Support Adaptation Across Sectors	33
ANNEX 3: Mitigation Options for Building a Green Economy	36

Acronyms and Abbreviations

CO₂e	carbon dioxide equivalent
CRGE	Climate-Resilient Green Economy
EFCCC	Environment, Forest and Climate Change Commission (formerly MEFCC)
FDRE	Federal Democratic Republic of Ethiopia
GHG	greenhouse gas
GTP	Growth and Transformation Plan
IPCC	Intergovernmental Panel on Climate Change
M&E	monitoring and evaluation
MEFCC	Ministry of Environment, Forest and Climate Change (now EFCCC)
MoC	Ministry of Construction
MoCT	Ministry of Culture and Transportation
MoANR	Ministry of Agriculture and Natural Resources
MoH	Ministry of Health
Mol	Ministry of Industry
MoPNG	Ministry of Petroleum and Natural Gas
MoT	Ministry of Transport
MoUDH	Ministry of Urban Development and Housing
MoWIE	Ministry of Water, Irrigation and Energy
MoWCA	Ministry of Women and Children Affairs
NAP	National Adaptation Plan
NAP-ETH	Ethiopia's National Adaptation Plan
NDC	Nationally Determined Contribution
NDMA	National Disaster Management Agency
NMA	National Meteorological Agency
NPC	National Planning Commission
UNFCCC	United Nations Framework Convention on Climate Change



1. INTRODUCTION

Ethiopia emits a very small proportion of global greenhouse gases (GHGs), yet the country is highly vulnerable to the impacts of climate change, which have grave implications for achievement of development goals. It has been estimated that climate change could reduce the country's GDP by up to 10 per cent by 2045 compared with a 2011 baseline scenario (Ministry of Environment, Forest and Climate Change [MEFCC], 2015). Assessments have found that agriculture, water and human health will be the most vulnerable sectors, with variations across regions based on socioeconomic, institutional and environmental conditions, among other factors. Pastoralists and smallholder farmers who are dependent on rainfed agriculture are the most vulnerable population. Climate change, poverty reduction and economic development are inextricably linked; consequently, climate change adaptation must be mainstreamed in development planning, projects and programs (MEFCC, 2015). At the same time, Ethiopia has an opportunity to pursue a low-carbon development pathway, achieving economic prosperity while minimizing the country's contribution to global climate change.

In response, the Government of the Federal Democratic Republic of Ethiopia (FDRE) officially launched the Climate-Resilient Green Economy (CRGE) initiative in 2011 to help Ethiopia achieve a middle-income country status that is both resilient to the impacts of climate change and low in GHG emissions. The CRGE strategy provides an overarching framework for Ethiopia's response to climate change, outlining the key pillars of its strategy. A green economy strategy document was also developed in 2011 to further elaborate the country's efforts toward low-emission development. More recently, in line with decisions under the United Nations Framework Convention on Climate Change (UNFCCC), Ethiopia developed its National Adaptation Plan (NAP-ETH), which provides further details on the country's strategies for adapting to climate change.

To operationalize the CRGE strategy and the complementary green economy strategy document, a guideline and checklist were developed to support mainstreaming of climate change mitigation in sector development plans. Following development of the NAP-ETH, the EFCCC recognized the need to update these tools and strengthen attention to climate change adaptation, in line with the options and strategic priorities identified in NAP-ETH. Indeed, the lack of guidelines for mainstreaming adaptation was identified as a barrier in Ethiopia's recent National Communication to the UNFCCC (MEFCC, 2015). In addition, the

update has provided an opportunity to consider how the tools can best reflect experience to date in implementing the green economy strategy, as well as lessons learned regarding good practice on adaptation and mitigation.

This updated guideline is designed to support the relevant ministries and regional offices within the Government of the FDRE in integrating the CRGE strategy in annual and medium-term sectoral plans. It begins with background information on the key concepts that are used in applying the tool, as well as a summary of available information on climate change in Ethiopia, as a basis for consideration of current and future climate risks in decision making. Next, an overview of the policy context that establishes the mandate for integrating climate change in sectoral decision making is provided. Finally, it offers targeted guidance for integrating climate change adaptation and mitigation in annual and medium-term planning processes, in line with the CRGE strategy, as well as the additional details provided in the green economy strategy and NAP-ETH documents. Box 1 provides an overview of the key features of the document.

Box 1. About the document

What is the purpose of this updated guideline?

This new guideline is designed to ensure that sector plans are climate resilient and contribute to developing a green economy. It reflects the latest thinking on how to implement the CRGE strategy. In particular, it integrates the climate resilience strategy as outlined in NAP-ETH.

Who is it for?

The guideline is for actors in sectoral ministries and regional bureaus with a mandate to integrate the CRGE strategy in their work.

When should it be used?

It should be used during medium-term (five-year) and annual planning processes. The guideline follows the key planning steps, so it should be used throughout the process.

How should it be used?

The guideline is designed to be used alongside other guidance documents for medium-term (five-year) and annual planning processes. Users should consult the guideline at each step in the planning process. The steps build on one another to form a coherent plan that responds to climate change.



2. BACKGROUND INFORMATION

This section provides background information needed to apply the guidance, including definitions of key concepts and information on observed and projected climate change in Ethiopia.

2.1 KEY CONCEPTS

In order to apply this guideline, a basic understanding of key concepts related to climate change is needed. Table 1 presents these key concepts as defined by the Intergovernmental Panel on Climate Change (IPCC) and the UNFCCC.

TABLE 1. KEY CLIMATE CHANGE CONCEPTS

CONCEPT	DEFINITION
Adaptation (to climate change)	The process of adjustment to actual or expected climate and its effects. In human systems, the aim is to moderate or avoid harm or to exploit opportunities.
Adaptive capacity	The ability of systems, institutions, humans and other organisms to adjust to potential damage, take advantage of opportunities or respond to consequences.
Climate	Average weather, usually defined over a period of 30 years. Key climate variables include temperature, precipitation and wind.
Climate change	A change of climate that is attributed directly or indirectly to human activity that alters the composition of the local atmosphere and that is in addition to natural climate variability observed over comparable time periods.
Mitigation (of climate change)	A human intervention to reduce the sources or enhance GHG sinks.
Resilience	The capacity of social, economic and environmental systems to cope with a hazardous event or trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation.
Vulnerability (to climate change)	The propensity or predisposition to be adversely affected by climate change.

Sources: IPCC, 2014; United Nations, 1992

2.2 CLIMATE CHANGE IN ETHIOPIA

Table 2 provides an overview of the observed and projected changes in climate at the national level. Box 2 provides links to additional information on climate change, globally and in Ethiopia.

TABLE 2. OVERVIEW OF OBSERVED AND PROJECTED CLIMATE CHANGE

CONCEPT	OBSERVED CHANGES	PROJECTED CHANGES
Temperature	<p>From 1954 to 2005, temperature data shows:</p> <ul style="list-style-type: none"> • A rising trend over the whole country: the mean temperature has increased by around 1°C since the 1960s, approximately 0.25°C per decade • Variations in the amount of warming from one part of the country to another • Increases in minimum and maximum temperatures • Increases in the frequency of hot days and nights • Decreases in the frequency of cold days and nights 	<ul style="list-style-type: none"> • Mean annual temperatures will continue to rise • Consistent warming in all seasons • Projected increase of up to 6°C by 2100 in the highest emissions scenario • Substantial increase in the frequency of hot days • Increase in evapotranspiration rates
Rainfall	<p>From 1951 to 2010, rainfall data shows:</p> <ul style="list-style-type: none"> • A slightly declining trend in mean annual rainfall • The trend varying from one region to another: highest variability in the drier southern regions and lowest variability in the wetter north and western regions • Increase in rainfall occurring as heavy rainfall events 	<ul style="list-style-type: none"> • Overall increase in annual precipitation (likely to be offset by increased evapotranspiration rates) • Significant seasonal and regional variability in rainfall projections • Increase in heavy and intense rainfall events
Extreme events	<ul style="list-style-type: none"> • Magnitude, frequency and intensity of droughts have increased since the 1970s 	<ul style="list-style-type: none"> • More frequent and intense droughts, particularly in Oromia, Somali and Southern Nations, Nationalities and People's Region • Potential increase in flooding due to heavy rainfall events

Source: Ministry of Environment & Forest, 2015; World Bank, 2018.

Box 2. Where to go for more information on climate change

The following are good sources for further information on the science of climate change:

- This [video](#) explains the science of climate change in four minutes.
- The [Summary for Policymakers](#) from the 2014 IPCC report provides a good overview of global climate science.

To learn more about climate change in Ethiopia:

- The [Second National Communication to the UNFCCC](#) provides a helpful analysis of the observed and projected changes for the country.
- The [Climate Change Knowledge Portal](#), established by the World Bank, allows you to explore different climate variables and scenarios, including by sector.
- For more localized information, check out the [Woreda Disaster Risk Reduction profiles](#), which provide an overview of climate-related (and other) hazards and risks for woredas across the country.



2.3 CLIMATE CHANGE IMPACTS ON KEY SECTORS

The climate change impacts described in the previous section have significant implications for progress in key sectors for economic development. An overview of the potential impacts on sectors that have been identified as particularly vulnerable is provided in Table 3.

TABLE 3. CLIMATE CHANGE IMPACTS IN VULNERABLE SECTORS

SECTOR	POTENTIAL IMPACTS		
Agriculture	<table border="0"> <tr> <td style="vertical-align: top;"> Crops <ul style="list-style-type: none"> • Reduced length of growing period • Changes to areas suitable for crop production • Negative impacts on crop productivity, leading to lower yields • Expanding crop diseases and pests • Increase in crop failure </td> <td style="vertical-align: top;"> Livestock <ul style="list-style-type: none"> • Changing herd dynamics • Decrease in availability and quality of feed, forage and water for livestock • Increase in distribution of some infectious diseases • Contracting of pastoral zones across the country • Increase in livestock death </td> </tr> </table>	Crops <ul style="list-style-type: none"> • Reduced length of growing period • Changes to areas suitable for crop production • Negative impacts on crop productivity, leading to lower yields • Expanding crop diseases and pests • Increase in crop failure 	Livestock <ul style="list-style-type: none"> • Changing herd dynamics • Decrease in availability and quality of feed, forage and water for livestock • Increase in distribution of some infectious diseases • Contracting of pastoral zones across the country • Increase in livestock death
Crops <ul style="list-style-type: none"> • Reduced length of growing period • Changes to areas suitable for crop production • Negative impacts on crop productivity, leading to lower yields • Expanding crop diseases and pests • Increase in crop failure 	Livestock <ul style="list-style-type: none"> • Changing herd dynamics • Decrease in availability and quality of feed, forage and water for livestock • Increase in distribution of some infectious diseases • Contracting of pastoral zones across the country • Increase in livestock death 		
Water	<ul style="list-style-type: none"> • Decrease in availability of potable water • Increase in water pollution • Decline in water supply • Increase in damage to aquatic habitats and life forms 		
Forestry	<ul style="list-style-type: none"> • Expansion of tropical dry forests and the disappearance of lower mountain wet forests • Increased loss of indigenous species and decline of natural regeneration • Expansion of toxic weeds • Increased prevalence of forest fires • Increase in diseases and pests • Desertification 		
Ecosystems and biodiversity	<ul style="list-style-type: none"> • Increase in ecosystem disturbances • Shifts in geographical ranges of some native plants and animals • Spread of invasive species and diseases • Degradation and loss of habitat • Decline in species and loss of biodiversity 		
Health	<ul style="list-style-type: none"> • Increase of vector-borne and water-borne diseases • Increasing malnutrition • Increase in injury and displacement due to extreme weather events. 		
Transport	<ul style="list-style-type: none"> • Damage to infrastructure from extreme weather events 		
Power	<ul style="list-style-type: none"> • Reduced generation of energy due to water scarcity • Physical damage to dams due to heavy rainfall, erosion and silting 		
Industry	<ul style="list-style-type: none"> • Decreased availability of water and raw materials • Damage to industrial infrastructure due to extreme weather events 		
Urban	<ul style="list-style-type: none"> • Increasing water scarcity • Damage to urban infrastructure (e.g., roads, building) due to extreme weather events • Increase in solid and liquid waste accumulation 		

Source: Adapted from Ministry of Environment & Forest, 2015; additional information from Ethiopian Panel on Climate Change, 2015.



3. POLICY CONTEXT

This section provides an overview of the key policies that have informed the development of this guideline.

3.1 CLIMATE-RESILIENT GREEN ECONOMY STRATEGY

The CRGE strategy, developed in 2011, also focuses on Ethiopia's goal to achieve middle-income country status by 2025, highlighting how this will be done in a low-carbon and climate-resilient manner. It outlines the strategy for achieving economic development in a sustainable way, highlighting both the country's prospects for growth and its vulnerability to climate risks and changes. The strategy is based on four pillars: improving crop and livestock production to increase food security and farmer income, while also reducing emissions; protecting and re-establishing forests to store carbon and provide economic and ecosystem services; expanding power generation from renewable sources; and leapfrogging to modern and energy-efficient technologies in transport, industry and buildings. It envisions a reduction in GHG emissions of approximately 250 megatonnes of carbon dioxide equivalent (CO₂e) by 2030, as well as reduced vulnerability to climate change in the agriculture, health, water, energy, buildings and transport sectors (FDRE, 2011a).

3.2 GROWTH AND TRANSFORMATION PLAN

The Growth and Transformation Plans (GTPs) are Ethiopia's overarching development plans. GTP II, which covers the planning period from 2015 to 2020, articulates Ethiopia's vision to become a lower-middle-income country by 2025. The plan envisions a pathway toward prosperity and development by creating a competitive, productive and inclusive economy (National Planning Commission [NPC], 2016), taking into account the sustainable development goals outlined in the 2030 Agenda for Sustainable Development (United Nations, 2015). Its specific objectives include: growth in GDP toward lower-middle-income country status; strengthening the agriculture and manufacturing sectors; solidifying public

mobilization and participation to ensure that development outcomes benefit; and strengthening the stability of the democratic developmental state (NPC, 2016). Environment and climate change are treated as a cross-cutting issue in GTP II, with reference to the CRGE strategy as a basis for addressing climate change. To this end, building a climate-resilient green economy is identified as one of the pillar strategies of the plan. This strategy calls for mainstreaming of the CRGE agenda in sector plans (NPC, 2016), creating a strong imperative for sectoral ministries to explicitly integrate climate change adaptation and mitigation in planning.

3.3 NATIONALLY DETERMINED CONTRIBUTION

In the context of the 2015 Paris Agreement under the UNFCCC, countries were requested to submit their Nationally Determined Contribution (NDC) to outline and communicate their post-2020 climate actions (UNFCCC, 2018). Ethiopia complied with this, submitting an NDC that includes information on both mitigation and adaptation actions to be implemented up to 2030. On mitigation, the NDC commits Ethiopia to reducing its GHG emissions by 64 per cent from the projected business-as-usual scenario for 2030, through actions in the agriculture, forestry, transport, power, industry and building sectors. The adaptation goal is to ensure that climate change adaptation is fully mainstreamed into development activities, to reduce vulnerability and promote economic growth that is resilient to climate change and extreme weather events. The NDC highlights the importance of the participation of and benefit for vulnerable groups within the population. It emphasizes actions to address risks associated with droughts and floods, as well as cross-cutting interventions such as insurance and early warning systems (FDRE, 2015).

3.4 GREEN ECONOMY STRATEGY

The green economy component of the CRGE strategy was further elaborated in a detailed strategy document, which was finalized in 2011. This document analyzes the major sources of GHG emissions in Ethiopia and provides a business-as-usual scenario for growth of these emissions to 2030. The main drivers of growth in emissions are identified as agriculture, forestry, electric power, transport, industry and buildings. Concrete actions are identified to reduce emissions while making development progress in each of these areas. Table 4 provides an overview of the key actions identified (FDRE, 2011b).

TABLE 4. KEY PILLARS AND OPTIONS FOR ACTION IDENTIFIED IN THE GREEN ECONOMY STRATEGY

PILLAR	GOAL	OPTIONS
Agriculture	Improving crop and livestock production practices for higher food security and farmer income while reducing emissions	<ul style="list-style-type: none"> • Intensify agriculture through use of improved inputs and better residue management • Create new agricultural land in degraded areas through irrigation development if expansion of cultivated area is necessary • Introduce lower-emission agricultural techniques • Increase animal value-chain efficiency to improve productivity • Support consumption of lower-emitting sources of protein • Mechanize draft power • Manage rangeland to increase carbon storage and improve productivity
Forestry	Protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks	<ul style="list-style-type: none"> • Reduce demand for fuel wood • Increase afforestation, reforestation and forest management • Promote area closure for rehabilitation of degraded pastureland and farmland
Power	Expanding electricity generation from renewable energy for domestic and regional markets	<ul style="list-style-type: none"> • Increase supply of hydro, geothermal, solar and wind power
Transport	Leapfrogging to modern and energy-efficient technologies	<ul style="list-style-type: none"> • Introduce stricter fuel-efficiency standards for passenger and cargo transportation • Promote purchase of hybrid and electric vehicles • Construct an electric rail network powered by renewable energy • Improve urban transport by introducing electric rail and fast and efficient bus transit • Substitute imported fossil fuels with domestically produced biodiesel and bio-ethanol
Industry	Leapfrogging to modern and energy-efficient technologies	<ul style="list-style-type: none"> • Improve energy efficiency in cement production • Substitute clinker • Increase share of biomass in the mix of energy for cement production <p>(Note: The strategy focuses on the cement sub-sector)</p>
Buildings	Leapfrogging to modern and energy-efficient technologies	<ul style="list-style-type: none"> • Accelerate transition to high-efficiency light bulbs for residential, commercial and institutional buildings • Use landfill gas management technologies • Reduce methane production from liquid waste

Source: FDRE, 2011b.

3.5 NATIONAL ADAPTATION PLAN

The National Adaptation Plan (NAP) process was established in 2010 through the Cancun Agreements under the UNFCCC (UNFCCC, 2010). It was further highlighted in the Paris Agreement as a key mechanism for achieving the global goal on adaptation (UNFCCC, 2015). NAP-ETH, completed in 2017, serves as the climate-resilience strategy under the CRGE framework. NAP-ETH has two goals: (i) to reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience to enhance economic development and (ii) to facilitate the integration of climate change adaptation into relevant policies, programs and activities, in particular development planning processes and strategies, across sectors and levels. Mainstreaming adaptation in development plans, policies and strategies is also identified as a strategic priority for the plan (FDRE, 2018). This guideline is a key tool for achieving this. Table 5 presents the key actions identified in NAP-ETH (FDRE, 2018).

TABLE 5. KEY ACTIONS IDENTIFIED IN NAP-ETH

ADAPTATION OPTIONS

- 1 Enhancing food security by improving agricultural productivity in a climate-smart manner
- 2 Improving access to potable water
- 3 Strengthening sustainable natural resource management through safeguarding landscapes and watersheds
- 4 Improving soil and water harvesting and water retention mechanisms
- 5 Improving human health systems through the implementation of changes based on an integrated health and environmental surveillance protocol
- 6 Improving ecosystem resilience through conserving biodiversity
- 7 Enhancing sustainable forest management
- 8 Building social protection and livelihood options of vulnerable people
- 9 Enhancing alternative and renewable power generation and management
- 10 Increasing resilience of urban systems
- 11 Building sustainable transport systems
- 12 Developing adaptive industry systems
- 13 Mainstreaming endogenous adaptation practices
- 14 Developing efficient value chain and marketing systems
- 15 Strengthening drought and crop insurance mechanisms
- 16 Improving early warning systems
- 17 Developing and using adaptation technologies
- 18 Reinforcing adaptation research and development

STRATEGIC PRIORITIES

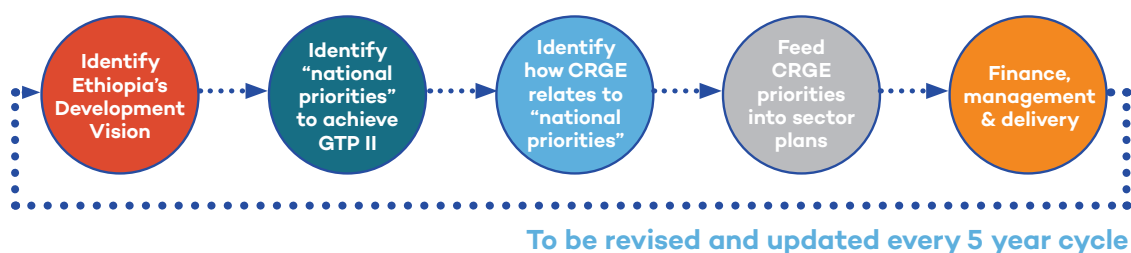
- 1 Mainstreaming climate change adaptation into development policies, plans and strategies
- 2 Building long-term capacities of institutional structures involved in NAP-ETH
- 3 Implementing effective and sustainable funding mechanisms
- 4 Advancing adaptation research and development in the area of climate change adaptation
- 5 Improving the knowledge management system for NAP-ETH

Source: MEF, 2014.

4. APPROACH TO INTEGRATING THE CRGE STRATEGY IN PLANNING

In developing the current development plan (GTP II) in 2014, the approach presented in Figure 1 was applied. This process was informed by the green economy strategy document; however, it pre-dated NAP-ETH, so the adaptation options and approaches therein were not incorporated in GTP II.

FIGURE 1. APPROACH TO INTEGRATING THE CRGE IN GTP II



Source: MEF, 2014.

The guidance in the following sections builds on this approach; however, it has been updated as follows:

- Strengthened integration of climate resilience, in line with NAP-ETH and Ethiopia's NDC
- Improved clarity on the difference between climate change adaptation and mitigation, and the respective benefits
- Incorporation of cross-cutting actions that enable adaptation across sectors
- Improved linkages to climate information and the sector checklists to enable informed decision making
- Incorporation of key questions for annual planning in addition to medium-term planning
- Recognition of the importance of environmental impact assessments
- Emphasis on capacity building for the sectors and other actors involved in implementing the CRGE strategy

In addition, it has been recognized that the process of integrating climate change also applies to national and regional planning, and consequently this updated guidance targets regional bureaus and the NPC, as well as federal-level sectors.

5. GUIDANCE ON INTEGRATING THE CRGE STRATEGY IN SECTOR AND REGIONAL PLANNING

The process of mainstreaming the CRGE strategy in planning involves integration of climate change adaptation and mitigation options, to ensure that sector and regional development plans contribute to enhancing climate resilience and building a green economy. This section provides guidance on integrating the CRGE strategy in sector and regional planning. It provides an overview of roles and responsibilities of the different actors in relation to integrating climate change in decision making, followed by step-by-step guidance for annual and medium-term planning.

5.1 ROLES AND RESPONSIBILITIES

Achieving the CRGE will require efforts on a number of different levels to mainstream climate change. Table 6 provides an overview of the roles and responsibilities of different actors as outlined in NAP-ETH and the green economy strategy.

TABLE 6. ROLES OF DIFFERENT ACTORS IN MAINSTREAMING THE CRGE STRATEGY

ACTOR	ROLE
Prime Minister's Office	<ul style="list-style-type: none">• With the Council of Ministers, provides leadership in developing, updating and coordinating the country's vision and mission related to development• Chair of the CRGE inter-ministerial committee
NPC	<ul style="list-style-type: none">• Providing overall planning guidance to sectors and regions• Reviewing and approving sector plans• Compiling sector plans into overall national development plan
EFCCC	<ul style="list-style-type: none">• Hosting the CRGE Technical/Core team• Coordinating CRGE implementation, including NAP-ETH and the green economy strategy• Providing guidance and support to sectors, regional bureaus and woredas in integrating adaptation and mitigation in planning, implementation and monitoring and evaluation (M&E)• Establishing institutional mechanisms to facilitate implementation• Building capacity on climate change adaptation and mitigation

TABLE 6. ROLES OF DIFFERENT ACTORS IN MAINSTREAMING THE CRGE STRATEGY (CONTINUED)

ACTOR	ROLE
Ministry of Finance and Economic Cooperation	<ul style="list-style-type: none"> • Hosting the CRGE facility, including M&E of the facility • Securing funds for CRGE implementation
Sectoral ministries	<ul style="list-style-type: none"> • Integrating climate change adaptation and mitigation into planning, in line with NAP-ETH and the green economy strategy document • Cascading plans to regional bureaus • Cascading plans to respective subordinate institutions (for example, the Ministry of Transport provides planning direction to the Ethiopian Roads Authority) • Providing capacity building and support to regions to integrate climate change in planning
Regional bureaus	<ul style="list-style-type: none"> • Developing regional development plans • Reviewing and approving woreda development plans • Mobilizing resources for implementation of plans • M&E of plans • Providing capacity building and support to zones and woredas to integrate climate change in planning
Regional NPC	<ul style="list-style-type: none"> • Providing overall planning guidance to zones and woredas • Reviewing and approving regional/woreda plans • Compiling regional sector plans into overall regional development plans

Sources: FDRE, 2018; FDRE, 2011b.





5.2 INTEGRATING CLIMATE CHANGE IN MEDIUM-TERM PLANS

The medium-term planning process is aligned with GTP II, providing sectors and regional bureaus with the opportunity to elaborate on how they will contribute to the achievement of GTP II objectives. This section provides guidance on integrating climate change in these plans, following a five-step process, as shown in Figure 2.

FIGURE 2. INTEGRATING CLIMATE CHANGE IN MEDIUM-TERM SECTOR PLANS



Step-by-step guidance is provided in the sections that follow. Throughout the guidance,  indicates the key questions to be answered for the step, and  shows the output of each sub-step.

STEP 1: Identify sector and regional actions to contribute to the GTP

This initial step identifies the key areas of action for sectors and regions to contribute to the achievement of the GTP.

Step 1a: Assess the contribution of the sector/region in relation to the GTP

The first step is to position the sector/region in relation to the GTP, in terms of how actions can support the priorities outlined in GTP strategy documents.



- Which of the GTP priorities is most relevant to the sector/region?
- Where can the sector/region have the most impact in terms of achieving GTP priorities?



List of most relevant GTP priorities for the sector/region

Step 1b: Identify sector/regional actions to achieve GTP II priorities

Next, identify areas of action for the sector/region to contribute to the GTP. These can be relatively broad as they will be further elaborated in the coming steps. This should be aligned with a planning guidance provided by the NPC.



- What actions are needed to make progress in the areas identified in Step 1a?
- What is the current status of sector/regional actions in these areas?



Key areas of action for the sector/region to contribute to the GTP

STEP 2: Climate resilience screening on sector/regional actions

This step looks at sector/regional actions to achieve the GTP objectives with a climate change lens, identifying potential risks and strategies to overcome these, as well as cross-cutting adaptation actions to reduce vulnerability and build resilience to climate change, in line with the CRGE strategy and NAP-ETH. Please keep in mind the guiding principles identified in NAP-ETH, which are presented in Box 3.

Box 3. NAP-ETH guiding principles

Implementation of NAP-ETH is governed by the following guiding principles:

- **Participation of a broad range of stakeholders, including regional bureaus, non-governmental organizations, private sector actors, academic institutions and donors**
- **Coherent interventions, informed by the best available information and based on collaboration among different actors**
- **Stakeholder empowerment, ensuring access to information, resources and opportunities**
- **Gender sensitivity, in terms of equal participation and benefit from adaptation actions, with emphasis on the particular barriers faced by women**
- **Equitable implementation, ensuring benefits for vulnerable groups, communities and ecosystems**
- **Partnership, including ongoing dialogue among different stakeholder groups**

These principles should be taken into consideration across all sector adaptation actions.

Step 2a: Assess climate risks to sector/regional actions

Looking at the actions identified in Step 1b, consider how they will be affected by climate risks. Refer back to Table 2 and Table 3 to conduct this assessment.



- How may changes in temperature and rainfall patterns affect progress on these actions?
- How may extreme weather events affect progress on these actions?
- Which regions, communities or groups are particularly vulnerable to climate risks in the sector? Why?
- Which livelihood strategies are particularly vulnerable to climate risks?
- Which infrastructure is vulnerable to climate risks?



Summary of climate impacts on sector/regional actions

Step 2b: Identify measures to reduce climate risks

With an understanding of how progress in the sector may be affected by climate risks, identify measures that can be taken to reduce these risks. Refer to Annex 1 for adaptation options that are relevant for different sectors, as identified in NAP-ETH.



- Which climate risks have the most potential to affect progress?
- What needs to be done differently in the sector/regional actions to reduce these risks?
- Are there additional actions needed to address climate risks in the sector?



List of actions to reduce climate risks

Step 2c: Identify cross-cutting adaptation actions

Mainstreaming climate change adaptation is not only about addressing climate risks to planned activities. In many cases, targeted and/or cross-cutting actions may be needed to reduce vulnerability and build resilience to climate change. Here, you will consider what other actions may be needed to support adaptation in the sector, referring to Annex 2, which identifies options that support adaptation across sectors.



- What actions may be needed to ensure that vulnerable people benefit from sector/regional actions?
- What is needed to ensure that sector/regional actions are implemented in a gender-sensitive manner?
- How can sustainable natural resource management and biodiversity conservation support the sector/regional actions?
- What role do resilient ecosystems play in supporting the sector/regional actions?
- What role can early warning systems play in supporting climate risk management in the sector/region?
- How can insurance mechanisms support progress in the sector/region in the context of increasing climate risks?
- What adaptation technologies are needed for the sector/regional actions to be effective?



List of cross-cutting adaptation actions

Step 2d: Identify enabling activities for climate change adaptation in the sector

With an understanding of how progress in the sector may be affected by climate risks, identify measures that can be taken to reduce these risks. Refer to the strategic priorities in Table 5 (bottom) to guide you in this step.



- What capacities are needed to implement the sector/regional actions in a climate-resilient manner? Which actors need these capacities?
- What climate information services are needed to support informed decision making in the sector/region?
- What additional financial resources are needed for the sector/regional actions to be implemented in a climate-resilient manner?
- What research and analysis are needed to inform decision making on climate change adaptation in the sector/region?



List of enabling activities to support climate change adaptation in the sector/region

STEP 3: Green economy screening on sector/regional actions

In this step, you will consider how the sector/region can contribute to reducing GHG emissions and increasing carbon sequestration, in line with the green economy strategy.

Step 3a: Assess GHG emission reduction potential for sector actions

Looking at the sector/regional actions, identify those that have potential to increase GHG emissions, as well as opportunities to achieve reductions and sequester carbon. Refer to the options in Table 4 to help in identifying the areas where reductions can be achieved.



- Which actions have the potential to increase GHG emissions? How can this be avoided?
- Which actions have the potential for GHG emission reductions and/or increased carbon sequestration?
- What progress has already been made toward sector/regional emissions reduction targets?
- Where is more progress needed?



List of sector/regional actions with potential for GHG emission reductions and/or carbon sequestration

Step 3b: Identify measures to reduce GHG emissions

Having identified the areas of action with potential to avoid or reduce GHG emissions, you can identify measures to realize this potential for climate change mitigation. Refer to Annex 3 for mitigation options for the different sectors.



- What needs to be done differently in the sector/regional actions to reduce GHG emissions and/or to increase carbon sequestration?
- Are there additional actions needed to reduce GHG emissions and/or increase carbon sequestration in the sector/region?



List of climate change mitigation actions

Step 3c: Identify enabling activities for reducing GHG emissions

As with adaptation, there may be additional activities that can create an enabling environment for reducing GHG emissions. You will identify these in this step.



- What capacities are needed to implement the sector/regional actions to reduce GHG emissions? Which actors need these capacities?
- What additional financial resources are needed for the sector/regional actions to be implemented in a way that contributes to climate change mitigation?
- How can an enabling socio-cultural environment for implementation be created?



List of enabling activities to support climate change mitigation in the sector/region

STEP 4: Identify roles and responsibilities

This step considers which actors must be involved in implementing the climate change adaptation and mitigation activities, including within the lead ministry, other ministries and actors outside the government. This step should be informed by a stakeholder mapping exercise.

Step 4a: Identify roles and responsibilities within the lead ministry

The lead ministry will have primary responsibility for coordinating and implementing the sector actions. Describe the roles and responsibilities of different actors within the lead ministry.



- Which directorates/entities have a role in coordinating and implementing the sector adaptation and mitigation actions?
- What are their responsibilities for ensuring effective coordination and implementation?
- Are additional institutional mechanisms required for effective implementation?



Table of sector adaptation and mitigation actions with lead ministry roles and responsibilities identified

Step 4b: Identify roles for other government actors

Looking at the cross-cutting and enabling actions identified in Steps 2c, 2d and 3c, consider which other government actors will be involved in implementation. Describe their roles in relation to the different activities.



- Which other ministries/bureaus are implicated in the cross-cutting and enabling actions?
- Which specific directorates/entities must be involved?
- What is the current status of collaboration with these actors?



Table of cross-cutting and enabling actions with other government roles identified

Step 4c: Identify roles for non-governmental actors

Successful implementation of the CRGE strategy will not be achieved by government alone. Civil society, private sector and research actors all have a role to play in implementing adaptation and mitigation actions. Here you will identify these actors and the roles that they will play.



- Which civil society actors have a role to play in implementing the sector/regional adaptation and mitigation actions?
- Which private sector actors have a role to play in implementing the sector/regional actions?
- What role can research institutions play in supporting implementation of the sector/regional actions?



Table of sector/regional actions with roles of non-governmental actors identified

STEP 5: Develop implementation strategies

In this final step, you will consider how the sector actions will be implemented.

Step 5a: Identify barriers and opportunities for delivery

In this step, you will identify the barriers and opportunities that may inhibit or support progress on the sector actions.



- What barriers exist that may inhibit progress on the sector/regional actions? Consider capacity, resource constraints, technical barriers, information and analysis, etc.
- Where are the opportunities to make progress on the sector/regional actions?



List of climate change mitigation actions

Step 5b: Describe how planned actions will be achieved

Building on Step 5a, as well as the roles and responsibilities identified in Step 4, you will now consider how the planned actions will be achieved.



- What institutional mechanisms already exist to support implementation of the planned actions?
- How will financial resources for implementation be accessed?
- Are there existing programs that could support implementation of the planned actions? Consider the Productive Safety Net Program (PSNP), the Sustainable Land Management (SLM) Program, planned Green Climate Fund (GCF) projects, etc.
- How will information and capacity gaps be filled?
- How will collaboration with other actors be facilitated?



Identification of key elements of an implementation plan for the sector/regional actions

Step 5c: Identify targets and establish baselines

In this final step, you will consider how progress will be monitored and establish performance targets, as well as the baseline situation for the planned actions. Refer to the indicators identified in Annexes 1, 2 and 3.



- Which indicators will be used to monitor progress on the planned sector/regional actions?
- What are the annual and end-of-plan targets for these indicators?
- Does baseline information exist for the indicators? If not, how will baselines be established?
- How will the indicators be monitored?
- How will success in building climate resilience and achieving GHG emissions reductions be evaluated?



Initial elements of a monitoring & evaluation plan

5.3 INTEGRATING CLIMATE CHANGE IN ANNUAL PLANS

The annual plans draw on the medium-term plans, providing an action plan for the upcoming year. Assuming that the medium-term plans have effectively integrated climate change, the annual planning process can focus on a few key questions, as shown below. If climate change has not been integrated in the medium-term plans, the steps described in Section 5.2 can be followed for the annual planning process.



Climate Resilience Actions

- What climate impacts affected the sector/region in the previous year?
- How did these impacts affect progress?
- What could be done differently to reduce the negative impacts if similar impacts are experienced in this planning year?
- What progress was made toward the targets established for adaptation actions?
- What evidence is there that climate resilience has been built?
- What lessons have been learned about climate change adaptation in the sector/region? How will these be applied in the coming year?

GHG Emission Reduction Actions

- What progress was made toward the targets established for GHG emission reductions?
- What evidence is there that emissions have been reduced?
- What lessons have been learned about climate change mitigation in the sector/region? How will these be applied in the coming year?

Implementation

- What challenges were faced in implementing the sector/regional adaptation and mitigation actions? What can be done differently this year to overcome these challenges?
- What is needed to improve collaboration with other actors in the coming year?
- What resource and/or capacity gaps were encountered that should be filled in the coming year?

Monitoring & Evaluation

- What challenges were encountered in monitoring progress on sector/regional adaptation and mitigation actions? How can these be overcome in the coming year?
- Is there a need to adjust indicators, targets or monitoring protocols for the coming year?



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ANNEX 1: ADAPTATION OPTIONS FOR BUILDING CLIMATE RESILIENCE IN SECTORS



AGRICULTURE SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
SUB-SECTOR: LIVESTOCK			
Enhance food security by improving agricultural productivity in a climate-smart manner (NAP-ETH Option 1)	Livestock diversification, including selection of drought-resistant animal breeds	<ul style="list-style-type: none"> Number of farmers/pastoralists (women/men) participating in livestock diversification Number of farmers/pastoralists (women/men) raising drought-resistant breeds Type/number of animals owned by farmers/pastoralists (women/men) 	Ministry of Agriculture and Natural Resources (MoANR), Ministry of Livestock and Fisheries (MoLF)
	Improved animal breeding and feeding systems	<ul style="list-style-type: none"> Number of households participating in improved animal breeding Number of animal breeds owned by farmers/pastoralists (women/men) Number of farmers/pastoralists (women/men) using improved animal feeding 	MoANR, MoLF
	Strengthen and expand animal health services	<ul style="list-style-type: none"> Type/number of existing animal health service delivery infrastructures strengthened (by region, district including urban) Number of new animal health service delivery infrastructures built Number of farmers/pastoralists/private investors (women/men) benefiting from animal health service delivery infrastructure Type/number of animals obtaining veterinary services from animal health service delivery infrastructure Number of animal health services delivering proper functions (by region, district including urban) 	MoANR, MoLF
	Prevent and control the spread of vector-borne diseases and macro-parasites	<ul style="list-style-type: none"> Number of kebeles/woredas covered by prevention and control programs for vector-borne diseases and macro-parasites Number of kebeles/woredas that have taken early action to prevent the spread of disease Type/number of animals obtaining veterinary services to prevent and/ or control spread of vector-borne diseases and/or macro-parasites Type/number of animal diseases controlled as a result of early warning actions Number of households benefiting from animal health services to prevent emergence and circulation of new diseases 	MoANR, MoLF



AGRICULTURE SECTOR ADAPTATION OPTIONS (CONTINUED)

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Strengthen sustainable natural resource management through safeguarding landscapes and watersheds (NAP-ETH Option 3)	Improve rangeland and pasture land management diversification, including selection of drought-resistant animal breeds	<ul style="list-style-type: none"> Number of farmers/pastoralists (women/men) trained on improvement of rangeland and pasture land management Number of farmers/pastoralists (women/men) participating in improved rangeland and pasture land management practices Area of rangeland and pasture land developed through application of improved rangeland and pasture land management practices (in hectares) 	MoANR, MoLF
Develop efficient value-chain and marketing systems (NAP-ETH Option 14)	Increase livestock value-chain efficiency to increase incomes	<ul style="list-style-type: none"> Number of farmers/pastoralists (women/men) participating in efficient value chains Type/number of animals with improved productivity following value-chain efficiency improvement Number of local markets established for livestock and livestock products Number of farmers/pastoralists (women/men) benefiting from increased livestock value chain 	MoANR, MoLF

SUB-SECTOR: CROPS

Enhance food security by improving agricultural productivity in a climate-smart manner (NAP-ETH Option 1)	Apply climate-resilient agricultural practices	<ul style="list-style-type: none"> Area of land developed through improved soil and crop management (in hectares) Area of land developed through integrated watershed management agricultural system (in hectares) Number of households benefiting from expansion of agroforestry practices Increased land productivity due to improved soil fertility/integrated watershed management (tonnes/year) 	MoANR
	Increase use of organic fertilizers	<ul style="list-style-type: none"> Amount of natural fertilizer prepared (tonnes/year) Area of land developed through application of natural fertilizer (hectares) Amount of yield obtained from application of natural fertilizer (kg/hectare/year) Number of agro-pastoralists/farmers (women/men) with awareness of use of natural fertilizers Number of households benefiting from natural fertilizers 	MoANR
	Expand the use of improved crop varieties	<ul style="list-style-type: none"> Number of agro-pastoralists/farmers (women/men) adopting improved varieties (disease and pest resistant/drought tolerant/early maturing/high yield) by crop type Number of agro-pastoralists/farmers (women/men) trained on improved crop varieties 	MoANR
	Strengthen crop disease and pest-monitoring system	<ul style="list-style-type: none"> Number of agro-pastoralists/farmers (women/men) with awareness of crop disease and pest-monitoring systems Strengthened crop disease and pest-monitoring systems Number of agro-pastoralists/farmers (women/men) with access to crop disease and pest-monitoring systems 	MoANR



AGRICULTURE SECTOR ADAPTATION OPTIONS (CONTINUED)

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
SUB-SECTOR: CROPS (CONTINUED)			
Strengthen sustainable natural resource management through safeguarding landscapes and watersheds (NAP-ETH Option 3)	Promote agro-biodiversity	<ul style="list-style-type: none"> Number of studies conducted to assess status of biodiversity in agricultural lands Area of agricultural lands with significant agro-biodiversity (hectares) Number of agro-pastoralists/farmers (women/men) with awareness of benefits and importance of increasing agro-biodiversity Number of agro-pastoralists/farmers (women/men) implementing agro-biodiversity practices 	EFCCC, MoANR
Develop and use adaptation technologies (NAP-ETH Option 17)	Develop small-scale irrigation	<ul style="list-style-type: none"> Area of agricultural land under small-scale irrigation (hectares) Area of treated acidic soil agricultural land for small-scale irrigation (hectares) Number of agro-pastoralists/farmers (women/men) that benefit from irrigation schemes 	MoANR
	Replace oxen power with small-scale mechanization systems/practices	<ul style="list-style-type: none"> Number of farmers (women/men) with awareness of the use of small-scale mechanization system Number of farmers (women/men) using small-scale agricultural mechanization practices Amount of yield obtained from application of small-scale mechanization system (kg/hectare/year) 	MoANR
	Develop lands through application of modern mechanization systems	<ul style="list-style-type: none"> Number of farmers (women/men) with awareness of the use of modern mechanization system Area of agricultural land developed through modern mechanized farming system (hectares) Number of private investors involved in modern mechanization system Number of farmers (women/men) with access to modern mechanized farming system Amount of crop yield obtained from application of modern mechanization system (kg/hectare/year) 	MoANR
Develop efficient value-chain and marketing systems (NAP-ETH Option 14)	Improve the resilience of value chains for crop products	<ul style="list-style-type: none"> Number of agro-pastoralists/farmers (women/men) participating in crop value-chain activities Number of agro-pastoralists/farmers (women/men) benefiting from efficient crop value chains Amount of increased productivity in crops due to increase in value-chain efficiency (kg/per hectare/by crop type) Number of market centres established for crop products 	MoANR



FORESTRY SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Enhance sustainable forest management (NAP-ETH Option 7)	Plan and implement forest health measures	<ul style="list-style-type: none"> Percentage of forestry practitioners aware of climate change impacts on forests Number of households with awareness on the causes and protection of forest fires Strategy designed to protect from forest fires (document) Length of firebreaks constructed in forest fire prone areas (km) Number of climate change-induced forest diseases/pests controlled Number/type of disease/pest resistant tree species released through research Area of forest land protected from climate-induced forest diseases (hectares) 	EFCCC
	Participatory forest management	<ul style="list-style-type: none"> Area of forest land under participatory management (hectares) Number of households benefiting from participatory forest management 	EFCCC
	Community-based rehabilitation of degraded forests	<ul style="list-style-type: none"> Type/number of ecosystem service, economic, and social benefits gained from plantation Number of households benefiting from the plantation 	EFCCC
	Afforestation/reforestation on degraded forest land	<ul style="list-style-type: none"> Area of degraded forest land degraded covered by afforestation/reforestation (hectares) Number/type of seedlings grown for plantation 	EFCCC



RENEWABLE ENERGY AND WATER SUPPLY SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Improve access to potable water (NAP-ETH Option 2)	Improve water and sanitation systems	<ul style="list-style-type: none"> Number/type of activities performed to protect surface water and groundwater from pollution Number/type of water supply and sanitation maps developed Percentage of households with access to potable water from new or rehabilitated systems/sources (rural areas/urban areas) Percentage of targeted population (women/men) with year-round access to safe drinking water (rural areas/urban areas) 	Ministry of Water, Irrigation and Energy (MoWIE)
	Promote efficient use of water	<ul style="list-style-type: none"> Number/type of measures taken achieving a decrease in water wastage by suppliers and consumers Percentage decrease in wastage of water Number/type of water consumers trained on efficient water use Percentage of households with awareness of efficient water use 	MoWIE
	Increase water availability	<ul style="list-style-type: none"> Number/type of projects/actions to safeguard watersheds and landscapes in order to protect water sources Area of watersheds protected and properly managed (hectares) Area of upper catchment protected and properly managed (hectares) 	MoWIE, EFCCC
Strengthen sustainable natural resource management through safeguarding landscapes and watersheds (NAP-ETH Option 3)	Safeguard hydropower dams	<ul style="list-style-type: none"> Number of climate change risk assessments conducted on hydropower generation capacity and infrastructure Number of projects to safeguard watersheds and landscapes to protect water sources for power generation Number of hydropower dams sustainably protected from siltation and encroachment 	MoWIE, EFCCC
Enhance alternative and renewable power generation and management (NAP-ETH Option 9)	Promote access to off-grid energy from low-carbon technologies	<ul style="list-style-type: none"> Percentage of consumers with access to off-grid energy from low-carbon technologies Number of households with access to off-grid energy from low-carbon technologies 	MoWIE
	Promote diverse energy mix	<ul style="list-style-type: none"> Percentage of different energy mixes (solar/wind/geothermal/other) in the national energy profile 	MoWIE



TRANSPORT SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Build sustainable transport systems (NAP-ETH Option 11)	Climate-resilient design and safety standards for transportation systems	<ul style="list-style-type: none"> • Number of infrastructure design and safety standards revised based on anticipated climate change impacts • Percentage of transport infrastructure designs applying climate-resilient design and safety standards • Number of safety guidelines developed • Number of people trained on climate risk management for transportation systems 	Ministry of Transport (MoT)
	Revise transportation planning, project screening and development process to take climate change into account	<ul style="list-style-type: none"> • Number/type of new projects with climate change adaptation components in their design • Number of projects that apply environmental impact assessments • Percentage of transport infrastructures that apply revised project planning, screening and development process • Type of adaptive infrastructure system constructed 	MoT
	Implement adaptive asset management systems based on projected changes in climate	<ul style="list-style-type: none"> • Number/type of adaptive management systems developed for different transportations • Number/type of transports with adaptive asset management systems considering climate change • Number/type of transport modalities with contingency plans to ensure resilience to weather-related disruptions 	MoT
	Facilitate movement of aid and support to communities affected by climate hazards	<ul style="list-style-type: none"> • Access road constructed to connect climate-vulnerable areas (km) • Climate-vulnerable woredas getting all-time transport access • Number of vulnerable communities/areas with new and/or improved transportation access • Number and types of projects designed and implemented to improve access to vulnerable areas/communities • Number of remote/vulnerable areas with access to transport systems 	MoT
	Protect transportation infrastructure from climate hazards	<ul style="list-style-type: none"> • Newly planted grass/trees on roadsides (hectares) • Soil conservation structures constructed alongside built up transportation infrastructures • Length of roadside and embankments protected from soil erosion and landslides (km) • Length of roadside protected by retaining walls (km) • Length of roadside with flood diversion structures and ditches (km) 	MoT



URBAN SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Increase the resilience of urban systems (NAP-ETH Option 10)	Improve provision and condition of housing	<ul style="list-style-type: none"> Percentage of population with access to improved housing Percentage of population with access to improved infrastructure Change in the percentage of households in urban slums 	Ministry of Urban Development and Housing (MoUDH)
	Enhance urban greenery	<ul style="list-style-type: none"> Number of buildings with green areas Number and area of green parks (hectares/city and region) Number of developed modern cemeteries Urban green areas per capita (m²/urban inhabitant) Percentage of urban areas covered by green infrastructure and recreational areas 	MoUDH
	Adaptive urban planning	<ul style="list-style-type: none"> Percentage of urban planners aware of climate change impacts in urban environments Number/type of urban agriculture projects Number of cities with completed hazard and vulnerability assessments Number of urban land use plans that take climate change impacts into account developed and implemented Percentage of cities with disaster risk reduction plans 	MoUDH



INDUSTRIAL SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Develop adaptive industry systems (NAP-ETH Option 12)	Enhance climate-smart production systems	<ul style="list-style-type: none"> Number of industries with climate-smart production systems established Number of industries using technologies that reduce raw material wastage Percentage decrease in raw material wastage Percentage of profit gained due to reduced raw materials wastage Percentage increase in production efficiency 	Ministry of Industry (Mol)
	Consider climate risks in establishment of industrial parks	<ul style="list-style-type: none"> Number of industries that are established in areas less exposed to climate risks (water stress/drought/flooding) Number of industrial parks created near to communities for resilience building Number of industries taking measures to manage climate risks 	Mol



HEALTH SECTOR ADAPTATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Improve human health systems through the implementation of changes based on an integrated health and environmental surveillance protocol (NAP-ETH Option 5)	Climate-sensitive disease prevention and management	<ul style="list-style-type: none"> Percentage of health workers aware of climate change impacts Percentage of target population covered by environment and health surveillance systems integrating climate change Number/type of climate-sensitive disease prevention programs designed and implemented Number of households using toilets (rural/urban) Number of households with properly designed solid and liquid waste disposal system (rural/urban) Number of disease surveillances undertaken based on integrated health and environmental surveillance protocol Number of households using in-house water treatment (rural/urban) 	Ministry of Health (MoH)
	Improve basic health services	<ul style="list-style-type: none"> Number of households applying family planning Number of health service provision infrastructures (rural/urban) Number of model households graduated from health service extension programs Number of kebeles under social health care systems Percentage of households with access to health services (urban centres/rural areas) 	MoH
	Improve emergency medical services	<ul style="list-style-type: none"> Percentage of households with access to emergency medical services (urban centres/rural areas) 	MoH

ANNEX 2: CROSS-CUTTING OPTIONS THAT SUPPORT ADAPTATION ACROSS SECTORS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Strengthen sustainable natural resource management through safeguarding landscapes and watersheds (NAP-ETH Option 4)	Integrate climate change adaptation in natural resource management planning	<ul style="list-style-type: none"> Number of natural resource management plans integrating adaptation developed for vulnerable landscapes Area of vulnerable landscapes where natural resource management plans integrating adaptation are implemented (hectares) 	EFCCC, MoANR
	Rehabilitate deforested watersheds to reduce soil erosion	<ul style="list-style-type: none"> Area of watershed and landscape rehabilitated through integrated land management (hectares) Productivity of the rehabilitated watershed area managed through integrated land management (tonnes/year) Production of forage from rehabilitated land through integrated land management (tonnes/year) Area of land protected from soil erosion (hectares) 	EFCCC, MoANR
	Area closure of deforested watershed, land and gullies to reduce soil erosion	<ul style="list-style-type: none"> Area of watershed and landscape rehabilitated through area closure and gulley control (hectares) Number of people (women/men/youth) benefiting from developing the rehabilitated land Area of land protected from soil erosion (hectares) 	EFCCC, MoANR
Improve ecosystem resilience through conserving biodiversity (NAP-ETH Option 6)	Integrate climate change adaptation in conservation planning	<ul style="list-style-type: none"> Percentage of conservation practitioners aware of climate change impacts on ecosystems # of conservation plans addressing climate impacts on ecosystems Area of land conserved in ways that build ecosystem resilience (hectares) 	EFCCC
	Improve wildlife and biodiversity management	<ul style="list-style-type: none"> Type/number of technologies used for monitoring wildlife movement, numbers and habitats Adaptation technologies adopted for forest and wildlife management Types of wildlife rehabilitated and increased Wildlife protection areas established (hectares) Number of established ex-situ and in-situ sites Number of species under protection Number of gene banks established Type/number of genetic resources conserved 	EFCCC, Ministry of Culture and Transport (MoCT) (WLDPA)
	Improve management of protected areas	<ul style="list-style-type: none"> Area of land under protection (national parks/protected areas) (hectares) Environmental, social and economic benefits gained from protected areas Number of households benefiting from protected areas 	MoCT (WLDPA)
	Improve water supply and health of wildlife	<ul style="list-style-type: none"> Number of infrastructures built in national parks and protected wildlife areas to improve wildlife water supply Number of infrastructures built in national parks and protected wildlife areas to improve wildlife health 	MoCT (WLDPA)

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Build social protection and livelihood options of vulnerable people (NAP-ETH Option 8)	Strengthen safety net systems for vulnerable groups	<ul style="list-style-type: none"> Number of vulnerable people (women/men) reached by safety net programs (urban/rural) Number of vulnerable people (women/men) graduating from safety net programs Number of households benefiting from safety net programs Number of households resettled Percent of vulnerable people (women/men) with access to social protection mechanisms when affected by a climate shock 	MoANR, MoUDH, Ministry of Labour and Social Affairs (MoLSA)
	Enhance access to financial services for vulnerable groups	<ul style="list-style-type: none"> Number of vulnerable people (women/men) who accessed financial services Number of vulnerable people (women/men) that built assets 	MoLSA
	Support livelihood diversification for vulnerable groups	<ul style="list-style-type: none"> Number of households that have engaged in diversified livelihoods Number of vulnerable people (women/men) who benefited from voluntary settlements Number of vulnerable people (women/men) who are organized under micro, small and medium enterprises Number of people with disabilities (women/men) who got employment opportunities 	MoLSA
Strengthen drought and crop insurance mechanisms (NAP-ETH Option 15)	Promote drought and crop insurance	<ul style="list-style-type: none"> Number of insurance companies offering drought and crop insurance Percentage of target population (women/men) that is covered by insurance mechanisms 	MoANR
Improve early warning systems (NAP-ETH Option 16)	Disaster risk management planning and preparedness	<ul style="list-style-type: none"> Number of woredas covered by disaster risk profile Number of woredas that have contingency plans for drought/flood Number of woredas that have a DRR plan 	National Disaster Management Agency (NDMA)
	Strengthen climate information and early warning systems	<ul style="list-style-type: none"> Increased number of meteorological stations Strengthened informal/Indigenous climate information exchange practices Number of systems established for increased access to climate information Number of early warning systems established for climate change-induced hazards Percentage of target population (women/men) with access to climate information/early warning systems Number of agencies with better preparedness for climate hazards 	National Meteorological Agency (NMA)
Develop and use adaptation technologies (NAP-ETH Option 17)	Enhance adaptation technology development and adoption	<ul style="list-style-type: none"> Number of adaptation technologies developed Number/type of actors adopting new adaptation technologies Number of people (women/men) benefiting from adaptation technologies 	Ministry of Science and Technology (MoST)

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Reinforce adaptation research and development	Strengthen multidisciplinary research on adaptation	<ul style="list-style-type: none"> • Number of research products produced that address climate change adaptation/consider climate change impacts • Documented cases of research informing climate-adaptive policies and practices 	MoST
(NAP-ETH Option 18)	Promote environmental education	<ul style="list-style-type: none"> • Number of people (women/men) trained on climate change adaptation at different administrative levels across sectors • Number of people (women/men) with awareness of climate change from community awareness programs • Number of formal, informal and non-formal education programs on climate change • Number and type of educational materials (print) produced and disseminated 	Ministry of education (MoE), EFCCC
Support gender equality	Mainstream gender equality across all actions	<ul style="list-style-type: none"> • Number of plans/programs where gender equality is mainstreamed • Number of sector actions with equitable benefits for women and men • Number of people (women/men) trained on gender equality and women's empowerment in adaptation at different administrative levels across sectors 	Ministry of Women and Children Affairs (MoWCA), Gender team in EFCCC

ANNEX 3: MITIGATION OPTIONS FOR BUILDING A GREEN ECONOMY



AGRICULTURE SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Sequester carbon through integrated natural resource conservation and management	Rehabilitate deforested watersheds to increase carbon sequestration	<ul style="list-style-type: none"> Area of watershed and landscape rehabilitated through integrated land management (hectares) Amount of carbon sequestered through integrated land management (CO₂e tonnes/year) 	MoANR
	Improve sequestration of greenhouse gas (GHG) emissions and protect soil erosion through area closure of deforested watersheds, land and gullies	<ul style="list-style-type: none"> Area of watershed and landscape rehabilitated through area closure and gully control (hectares) Amount of GHGs sequestered due to closure of deforested watershed (CO₂e tonnes/year) Area of land protected from soil erosion (hectares) 	MoANR
	Use low-carbon technologies/ farming methods	<ul style="list-style-type: none"> Area of land developed through improved soil and crop management (hectares) Area of land developed through integrated watershed management agricultural system (hectares) Number of households benefiting from extension of agroforestry experiences Increased land productivity due to improved soil fertility (tonnes/year) 	MoANR
Apply lower-emitting technologies	Enhance and intensify the diversification of animal mix toward lower-emitting animals	<ul style="list-style-type: none"> Number of people (farmers/pastoralists and men/women) involved in production of lower-emitting species (poultry/sheep/goat/fish) Number of lower-emitting species produced (poultry/sheep/goat/fish) Amount of GHG emissions reduced due to increased production of lower-emitting species (CO₂e tonnes/year) Number of people (farmers/pastoralists and men/women) with improved livelihoods from production of lower-emitting species 	MoANR, MoLF
Modernize agricultural systems	Replace oxen power with small-scale mechanization practices	<ul style="list-style-type: none"> Number of people (women/men) with awareness of the use of small-scale mechanization practices Number of people (women/men) using small-scale agricultural mechanization practices Amount of yield obtained from application of small-scale mechanization practices (kg/hectare/year) Amount of GHG emissions reduced through application of small-scale mechanization practices (as a result of replacement of oxen power) (CO₂e tonnes/year) 	MoANR



FORESTRY SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Protect and re-establish forests for their economic and ecosystem services, including as carbon stocks	Commercial afforestation and reforestation	<ul style="list-style-type: none"> • Area of land covered by new plantations (hectares) • Area of land enclosed and protected for rehabilitation of plantation forest (hectares) • Amount of carbon sequestered by plantations (CO₂e tonnes/year) 	EFCCC
	Rehabilitate degraded land	<ul style="list-style-type: none"> • Area of land covered by ex-closures (hectares) • Area of degraded land covered by plantations (hectares) • Area of forest land rehabilitated (hectares) • Number of households benefiting from rehabilitated forests • Amount of carbon sequestered by the rehabilitated forest (CO₂e tonnes/year) 	EFCCC
	Improve management of protected forests	<ul style="list-style-type: none"> • Type/number of protected forest areas in the country (hectares) • Area of properly managed and protected forest areas in the country (hectares) • Amount of carbon sequestered by the protected forests (CO₂e tonnes/year) 	EFCCC
	Reduce firewood demand by disseminating improved cookstoves	<ul style="list-style-type: none"> • Number of households with awareness on improved cookstoves • Type/number of improved cookstoves distributed • Number of households that use improved cookstove technology (by region/woreda) • Amount of GHG emission reduced due to the utilization of improved cookstove technology (CO₂e tonnes/year) • Number of cooperatives organized in production of improved cookstoves 	EFCCC



RENEWABLE ENERGY AND WATER SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Promote alternative energy sources (biogas, electric, renewables, etc.)	Raise awareness of alternative energy sources	<ul style="list-style-type: none"> Number of households with awareness of alternative (non-biomass-dependent) sources of energy Number of households that use non-biomass-dependent source of energy Amount of GHG emissions reduced due to utilization of alternative energy source (CO₂e tonnes/year) Area of land deforestation reduced due to utilization of alternative energy source (hectares) Types and number of technologies (non-biomass) developed and disseminated 	EFCCC, MoWIE
Use clean fuel technologies	Distribute electric stoves	<ul style="list-style-type: none"> Number of households reached with awareness raising on electric stoves Type/number of electric stoves distributed in rural/urban areas Number of households using electric stoves Amount of GHG emissions reduced from use of electric stoves (CO₂e tonnes/year) 	MoWIE
	Distribute liquefied petroleum gasoline (LPG) stoves	<ul style="list-style-type: none"> Number of households reached with awareness raising on LPG stoves Type/number of LPG stoves distributed in rural/urban areas Number of households using LPG stoves Amount of GHG emissions reduced from use of LPG stoves (CO₂e tonnes/year) 	MoWIE
	Distribute biogas stoves	<ul style="list-style-type: none"> Number of households reached with awareness raising on biogas stoves Type/number of biogas stoves distributed in rural/urban areas Number of households using biogas stoves Amount of GHG emissions reduced from use of biogas stoves (CO₂e tonnes/year) 	MoWIE
	Blend fuels with ethanol	<ul style="list-style-type: none"> Amount of GHG emissions reduced from fuel blending (CO₂e tonnes/year) Amount of foreign currency saved as a result of fuel blending (USD/year) 	Ministry of Petroleum and Natural Gas (MoPNG)
Use green technologies in modern buildings	Supply energy-efficient technologies to residential, commercial and business buildings	<ul style="list-style-type: none"> Number of compact florescent light (CFL) bulbs distributed to residential areas Number of high-efficiency bulbs supplied to business and manufacturing industries Number of policy/legal measures taken to ban energy-inefficient incandescent lamps Percentage increase in number of households using grid electricity from renewable Number of people that replaced diesel-powered pumps with renewable energy technologies Amount of power generated through transforming waste to energy (MW) Amount of GHG emissions reduced (CO₂e tonnes/year) 	MoWIE



TRANSPORT SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Modernize transport by shifting to fuel-saving vehicles	Decrease fossil fuel consumption through incentivizing the availability of new electric and hybrid cars	<ul style="list-style-type: none"> • Number of electric and hybrid cars introduced • Transport service provided by electric and hybrid cars (km) • Amount of fossil fuel consumption reduced by using electric and hybrid cars (litres) • Number of passengers transported by public electric buses • Number of policy/legal measures taken to increase transport alternatives using electricity • Amount of GHG emissions reduced through these policy/legal measures (CO₂e tonnes/year) 	MoT
	Promote alternative fuels for vehicles (ethanol, biodiesel)	<ul style="list-style-type: none"> • Amount of ethanol produced from sugarcane and other plants (litres/type) • Amount of ethanol consumed (litres/year) • Amount of foreign currency saved by using ethanol and biodiesel (USD/year) • Amount of GHG emissions reduced through using ethanol and biodiesel (CO₂e tonnes/year) 	
	Reduce passenger and freight transport by vehicles through introducing mass passenger and freight transport by long-distance electric railways	<ul style="list-style-type: none"> • Length of electric railways constructed (km) • Distance traversed through transporting passengers and goods on electric railways (km/month and km/year) • Number of people/passengers using electric railways • Amount of GHG emissions reduced through using electric mass transport alternatives (CO₂e tonnes/year) 	MoPNG
	Decrease pollution in cities through constructing electric bus lanes and railway lines	<ul style="list-style-type: none"> • Number of passengers transported by public electric buses and trains (people/year) • Number of electric buses and trains in service • Amount of GHG emissions reduced through using electric mass transport alternatives (CO₂e tonnes/year) • Distance covered by electric bus lanes and railways (km) 	MoT
	Improve transport services	<ul style="list-style-type: none"> • Distance covered through city express bus transport (km/year) • Number of imported hybrid vehicles • Number of electric vehicle charging stations in the city (number/city) • Number of standards and guidelines issued for improving transport services • List of actions taken to reduce air and noise pollution • Type/number of measures taken to improve road safety and road congestion • Number of modern parking lots built to decrease road congestion 	MoT



TRANSPORT SECTOR MITIGATION OPTIONS (CONTINUED)

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Promote alternative transportation	Promote bicycles as a means of transportation	<ul style="list-style-type: none"> • Number of people (women/men) reached with awareness raising on the use of bikes • Number of people (women/men) using bikes • Number of bikes providing transport services • Number of people (women/men) using alternative non-pollutant transport • Type/number of non-pollutant transport alternatives • Number of access roads constructed for bikes (km) 	MoT
Ban import of used cars and tires	Establish a system to ban the import of used cars and tires	<ul style="list-style-type: none"> • Awareness raising on banning imported used cars and tires • System set up to ban import of used cars and tires 	MoT



URBAN SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Improve waste management in cities	Reduce urban solid wastes	<ul style="list-style-type: none"> Percentage of population covered by solid waste collection and disposal Number of cities with solid waste transport trucks Number of solid waste transfer sites in the cities Number of public toilets built and providing services in the cities Number of cities practising waste reuse and recycling Number of cities practising waste segregation Amount of GHG emissions reduced (CO₂e tonnes/year) 	MoUDH
	Reduce liquid wastes in urban areas	<ul style="list-style-type: none"> Percentage of population covered by sewer systems Percentage of roadside drainage that is functional Percentage of urban population that has proper sanitation Amount of GHG emissions reduced (CO₂e tonnes/year) 	MoUDH, MoWIE
	Change methane to energy through anaerobic solid waste management	<ul style="list-style-type: none"> Area of landfills constructed (hectares) Number of cities that have proper landfills Amount of electricity generated through burning methane (MW) Number of landfills with evaporator systems Number of landfills in a city with safety structures Number of garbage sorting and recycling companies Number of people (women/men) employed by the landfill constructed Amount of income generated from energy production from solid waste 	MoUDH
	Change methane to energy through anaerobic liquid waste management	<ul style="list-style-type: none"> Number of cities with centralized sewage treatment systems Number of cities with effective liquid waste transport facilities or decentralized sewage treatment systems List of activities performed to control liquid waste disposal Amount of energy generated from liquid waste by burning methane (MW) 	MoUDH, MoWIE
	Reduce release of methane through decomposing solid waste to compost	<ul style="list-style-type: none"> Amount of compost produced from solid waste (m³) Amount of GHG emissions reduced by composting solid waste (CO₂e tonnes/year) 	MoUDH



URBAN SECTOR MITIGATION OPTIONS (CONTINUED)

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Green buildings and construction	Apply different green technologies, designs and knowledge in building construction	<ul style="list-style-type: none"> Construction action plans developed for different projects Number of climate-smart construction designs prepared Number of monitoring and evaluation systems established to control or prevent environmental pollution from buildings/construction Size of rehabilitation work undertaken in quarries (hectare/km²) Number of buildings/construction that uses green and modern technologies 	Ministry of Construction (MoC)
	Promote energy efficiency in residential, commercial and business buildings	<ul style="list-style-type: none"> Number of CFL bulbs distributed Number of high-efficiency bulbs supplied to business and manufacturing industries Number of policy/legal measures taken to ban energy-inefficient incandescent lamps Percentage increase in number of households using grid electricity from renewables Number of people (women/men) that replaced diesel powered pumps with renewable energy technologies Amount of power generated through transforming waste to energy (MW) Amount of GHG emissions reduced (CO₂e tonnes/year) 	MoWIE, MoUDH



INDUSTRIAL SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Leapfrog to modern and energy-efficient technologies	Promote green technologies	<ul style="list-style-type: none"> Type/number of green technologies promoted Number of institutions and cooperatives that use the promoted green technologies Number of manufacturing industries that use energy saving technologies in the production process Amount of GHG emissions reduced (CO₂e tonnes/year) 	Mol
	Reduce emissions from cement production	<ul style="list-style-type: none"> Number of manufacturing plants that use power-saving technologies and reduced expenses Number of cement factories who replaced clinker by increasing pumice in cement production Number of cement factories that use plant and agricultural residues to generate energy Number of cement manufacturing plants that introduced new technologies Amount of plant residue used for energy (tonnes) Amount of GHG emissions reduced (CO₂e tonnes/year) 	Mol
	Improve industrial waste management systems	<ul style="list-style-type: none"> Number of industries that replaced chemicals with enzymes Number of industrial plants with proper functional waste treatment/disposal systems as applicable (solid/liquid/electronic wastes) Number of industries that use waste reuse/recycling technologies 	Mol

HEALTH SECTOR MITIGATION OPTIONS

OPTION	KEY ACTIONS	INDICATORS	IMPLEMENTING AGENCIES
Manage indoor air pollution	Disseminate alternative technologies for domestic use	<ul style="list-style-type: none">Percentage decrease in indoor air pollution in urban areas due to dissemination of alternative energies	MoH, MoT



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Environment, Forest and Climate Change Commission

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