**Ministry of Finance and Economic Cooperation (MOFEC)**

**Climate Resilient Green Economy (CRGE) Facility**

# Climate Change Related Expenditures in the Forest, Urban and Transport Sectors in Ethiopia

**Draft**

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## Acronyms

| | |
|---|---|
| AfDB | African Development Bank |
| CRGE | Client Resilient Green Economy |
| CO2e | Carbon dioxide equivalent |
| CRTSS | Climate Resilient Transport Sector Strategy |
| ETB | Ethiopian Birr |
| ECR-3G2P | Ethiopian Cities Resilient and Green Growth and Governance Programs Package |
| FDRE | Federal Democratic Republic of Ethiopia |
| GDP | Gross Domestic Product |
| GHG | Greenhouse Gas |
| GTP | Growth and Transformation Plan |
| MEFCC | Ministry of Environment, Forest and Climate Change |
| MoFEC | Ministry of Finance and Economic Cooperation |
| Mt | Metric tone |
| NAP | National Adaptation Plan |
| NGOs | Non-governmental organizations |
| NPC | National Planning Commission |
| PFM | Participatory Forest Management |
| REDD | Reducing Emission from Deforestation and Forest Degradation |
| SDGs | Sustainable Development Goals |
| USD | United States Dollar |
| ULGDP | Urban Local Government Development Program |

# 1. Introduction

## 1.1 Background

The Government of Ethiopia has fully recognized the need to urgently manage climate change challenges and made a policy decision to pursue climate resilient and green growth pathways. This is articulated in the Climate Resilient Green Economy (CRGE) strategy of the country. As reflected in the Climate Resilient Green Economy (CRGE) strategy, and further committed in the Ethiopia's Intended National Contribution, the country aims to reduce 64 percent of the annual emissions by 2030 compared to the emission of business as usual (BAU) pathways. This means Ethiopia's emission will be 150Mt $CO_2e$ rather than 400 Mt of CO2e equivalent estimated under the BAU development pathways. It is estimated that Ethiopia needs to invest about US$150 billion between 2011 and 2030 to achieve green growth objective and an additional US$ 6 billion to achieve sectoral climate resilience objectives, notwithstanding the co-benefits of the two goals (FDRE, 2017).[1]

Ethiopia has been implementing the CRGE strategy since 2011 and has further integrated the CRGE strategy into the second Growth and Transformation Plan (GTP-II) (2015/16-2019/20) (NPC, 2016). This ensures that the CRGE is part of a comprehensive national plan and not a standalone initiative. In this regard, substantial public investments are being made to support CRGE interventions. Additionally, legal and institutional reforms are necessary to create an enabling environment for private sector and community engagement in CRGE action are ongoing. It is also recognized that a considerable amount of investment in CRGE is being delivered through community mobilization and non-state actors.

The resources required for realization of Vision 2025 and 2030 significantly exceeds current supply. At the same time, there is a need for a full account of baseline financing from the variety of sources (i.e. public, private, community and non-governmental organization) involved in CRGE financing; based on which the gap between demand and supply for climate finance/investment can be determined. There is also a need to identify and assess financing options and sources for the key CRGE sector, which are critical for addressing climate change related vulnerabilities in Ethiopia.

[1] FDRE (2017), Ethiopia's Climate Resilient Green Economy: Ethiopia's National Adaptation Plan, Addis Ababa.

The Government of Ethiopia uses a budget classification system with several layers of information. Two broad categories of expenditure components can be identified within total government expenditure: capital and recurrent expenditures. Accordingly, of the total annual government expenditure, on average 60 percent was allocated for capital investment, while the remaining was allocated to recurrent expenditure between 2010/11 and 2014/15 (NPC, 2015). About 70 percent of government expenditure was allocated to pro-growth and pro-poor sectors as roads, education, health, agriculture and food security, and water and sanitation. In a nut shell, the structure of Ethiopia's budget allocation indicates strong commitment of the government to long-term development and poverty eradication. In particular, the Government of Ethiopia also considers climate change as an economic development issue rather than a mere environmental concern.

### 1.2 Rationale for climate finance tracking and financing

The CRGE strategy estimates that Ethiopia requires an annual investment of over USD 7.5 billion for 20 consecutive years in order to realize its vision of building a climate smart middle income economy by 2030. This estimate, however, doesn't provide a clear financing breakdown regarding the contributions of different stakeholders (i.e. government, communities, private sector, bilateral and multilateral development partners, etc.) including the mode of contributions (i.e. grant, concessional loan, etc.). It doesn't also provide guidance on what constitutes climate finance for Ethiopia. Hence, there is a need for a full account of baseline climate financing from a variety of sources (e.g. public, private, community and non-governmental organization), which will help to estimate the gap between demand and supply for climate finance.

The CRGE Facility through the Global Green Growth Institute (GGGI) Technical Support has developed a Climate Finance Tracking and Projection Methodology and conducted climate finance tracking and projections for the Forest, Transport and Urban Development Sectors in 2017 and 2018. The Climate Finance Tracking and Projection Methodology was presented and approved by the CRGE Facility Management Committee, which provides strategic guidance regarding the overall operation of the Facility. Accordingly, this Methodology was applied to assess baseline climate finance investment, project future climate finance and investment needs and design appropriate CRGE financing strategy for

the above listed sectors. This report presents the results of the climate finance tracking and projection assessment for the three sectors. The work on assessing and estimating climate change related financing needs for the sectors is ongoing and the report will be published separately.

### 1.3 Objectives

The purpose of this report is to characterize government budget allocations to the forestry, transport and urban sectors and identify climate change related expenditures in these sectors. The overall objective of the climate finance tracking and projection assessment is to undertake a comprehensive estimate of climate change relevant finance/investment needs, baseline (2011-2016) climate change relevant CRGE finance/investments and forecast climate relevant expenditures for the forest, transport and urban sectors.

The specific objectives of the assignment include:

- Determine economy wide baseline (2011-2015) of CRGE financing/investment (including public, private, NGO's, communities, etc.) using nationally approved tools, but informed by best practice in the industry practice area (climate finance);
- Undertake CRGE financing need analysis for (2015-2020), (2020-2025) and (2025-2030);
- Identify and assess CRGE financing options from varieties of sources, including national and international public and private sector, non-state actors and communities, and provide finance/investment "demand and supply" and propose strategy for gap filling; and
- Undertake extensive and relevant CRGE data collection and analysis from variety of sources including: federal, regional and local government, domestic and international private sector; national and international NGOS, academic and research organizations, bilateral and multilateral development partners, review of relevant assessments and studies by national and international entities.

The report is structured as follows. Following the introduction (Chapter 1), Chapter 2 briefly describes the approach and methodology of the assessment, while chapter 3 highlights the economic and social context of the country. Chapter 4 presents the results of the climate finance tracking projection assessment for the three sectors separately. The last section summarizes the key results of the assessment, including the major gaps and challenges, which trigger more work in the future.

## 2. Approach and Methodology

### 2.1 Conceptualizing Climate Finance

Developed country Parties have made commitment "to a goal of mobilizing jointly $100 billion dollars a year by 2020" in climate finance at the 15th United Nations Convention on Climate Change (UNFCCC) Conference of the Parties (COP 15) in Copenhagen in 2009. In spite of this, there is no universally accepted definition of "climate finance". According to the UNFCCC's Standing Committee on Finance (2014), "Climate finance aims at reducing emissions, and enhancing sinks of greenhouse gases and aims at reducing vulnerability of, and maintaining and increasing the resilience of, human and ecological systems to negative climate change impacts"[2]. Climate finance refers to the flow of funds toward activities aimed either at (i) 'mitigation', for example, investment on technologies and innovations which can reduce greenhouse gas (GHG) emissions, or (ii) 'adaptation', i.e. helping societies to develop resilience in adapting to the negative effects of climate change.

A fundamental challenge in quantifying and monitoring climate finance is that there is no agreed definition of what counts as 'climate finance'. Policy makers, investors, financial intermediaries and analysts do not always have the same understanding of key climate finance terms and concepts. Building a common understanding of key climate finance terminology would improve ongoing discussions on how best to estimate climate finance, clarify efforts to measure its effectiveness, and help identify where public sector interventions can best impact the scale up of climate finance (Falconer *et al.*, 2014)[3]. The literature offers two types of definitions related to climate finance. According to the broad definition, climate finance is the flow or allocation of funds toward activities that reduce greenhouse gas emissions or help society adapt to climate change's impacts. It is the totality of flows directed to development projects that include climate benefits.[4]A narrow definition of climate finance might include finance that supports discrete climate activities, but excludes activities in which climate considerations are mainstreamed into traditional development assistance through a "climate-proofing" process.

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[2]UNFCCC Standing Committee on Finance (2014), "Biennial Assessment and Overview of Climate Finance Flows Report 2014", Bonn, Germany.

[3]Angela Falconer and Martin Stadelmann (2014), What is climate finance? Definitions to improve tracking and scale up climate finance. A Climate Policy Initiative Brief.

[4] See also http://www.wri.org/blog/2013/04/why-climate-finance-so-hard-define

The principles of the UNFCCC suggest that developed countries mobilize 'new and additional' financial resources to meet the 'incremental costs' of climate change. The practical interpretation of this principle, however, has been a source of debate and controversy (Watson *et al.*, 2012)[5]. According to this definition, only those financial commitments and investments beyond a 'business-as-usual' case would be included under climate finance. Again there is no a common understanding on what is considered as "additional".[6]

Distinguishing climate finance from other forms of finance (e.g. official development assistance) is another challenge inherent in all climate finance quantification and monitoring efforts, whether by a contributor or a recipient. Countries and contributor institutions use a variety of definitions to identify climate finance, with significant implications for questions regarding the quantity and characteristics of this finance. Note that some activities are not being undertaken specifically to address climate change, but may in fact still generate benefits for multiple policy objectives simultaneously, making the distinction between "climate change finance" and finance for other activities somewhat arbitrary. In the Ethiopian context, climate finance refers to flow or allocation of funds from public, private, bilateral and multilateral sources toward financing adaptation and mitigation initiatives as specified in the CRGE Strategy and GTP-II. On top of this, national working definition, projects and programs shall be screened through The Rio+ climate markers in order to categorize climate change related adaptation and mitigation projects and programs. Once this is done, the next step is assessing the proportion of the budget line that is related to climate change outcomes according to the weighting criteria indicated.

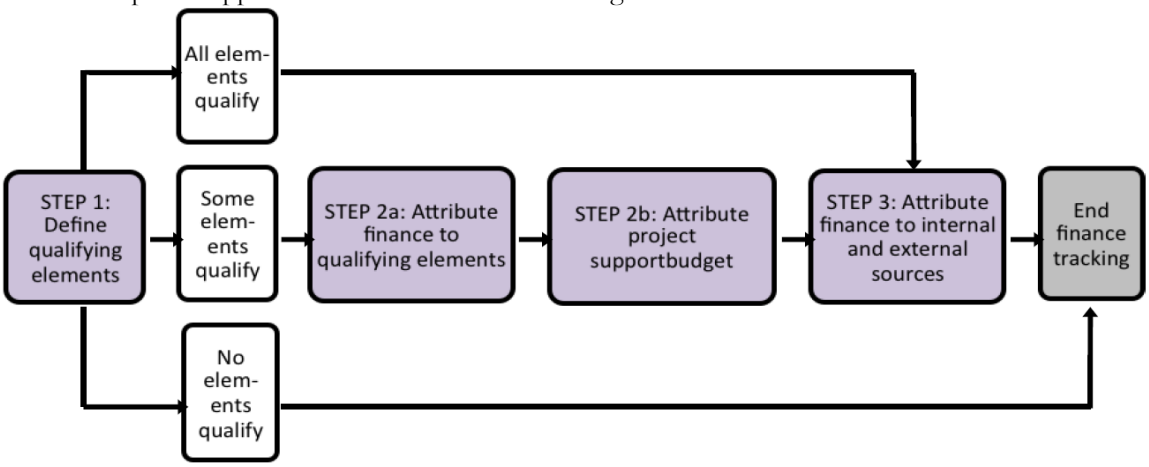
### 2.2.2 Identifying climate investments and expenditures

The African Development Bank guideline (AfDB, 2013) and CRGE Facility climate finance tracking frameworks help identify climate related actions in the transport, forest and urban sectors. According to the AfDB (2013) framework, there are a maximum of three steps to apply, depending on the number of qualifying project elements including project components, sub-components, and activities (Figure 1). The component, sub-component, or activity identified as qualifying must be listed in the project description. This indicates

[5] Charlene Watson, Smita Nakhooda, and Alice Caravani (2012), The practical challenges of monitoring climate finance: Insights from Climate Funds Update, Climate Finance Policy Brief.
[6] See also http://www.wri.org/blog/2013/04/why-climate-finance-so-hard-define

that there is a need to look at different levels to map finance dedicated to climate adaptation and mitigation at a reasonable level of granularity. Hence, rather than considering an entire project for climate finance reporting eligibility from the outset, eligibility might need to be assessed at the activity or component level in case of projects that contain both adaptation and/ or mitigation activities/components but also other activities/components that might not qualify. This helps determine the magnitude of adaptation and mitigation finance associated with a project and programme.

Figure 1: A simplified approach to climate finance tracking



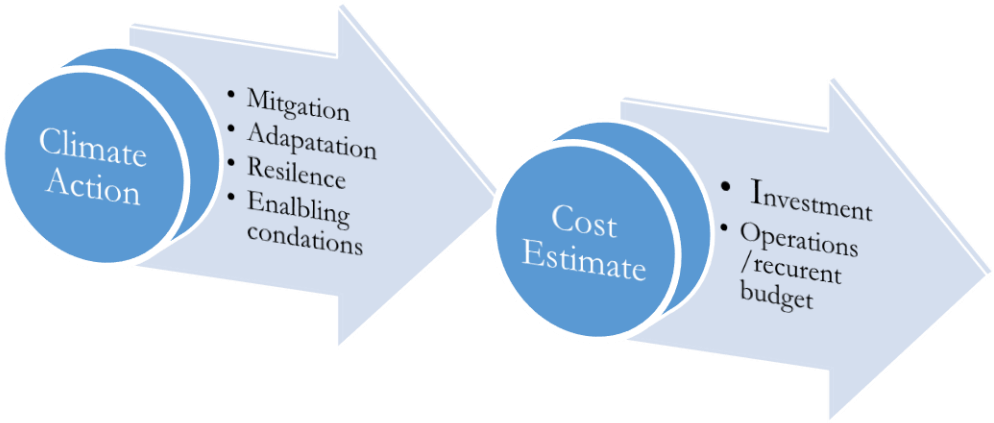

Source: AfDB (2013)

The assessment uses budget and expenditure analysis framework in order to quantify or capture budget allocation and climate investment needs in the country as articulated in the CRGE Facility climate expenditure and finance tracking methodology. In doing so, a stepwise approach will be followed (Figure 2). First, given that climate finance and related terminology are often understood in different ways by different stakeholders, this calls for building a shared understanding of climate finance terminologies on how best to assess and analyze climate finance and investment needs in the country. For this purpose, the operational definition of the CRGE Facility will be used. The second step involves, using the first step as a guide, identifying climate related activities and programs as indicated in the medium-term development plans (e.g. Growth and Transformation Plan (GTP-II) as well as sectoral development plans of the transport and urban sectors). This will help identify climate related activities across sectors and over time for the three sectors.

The third step involves an assessment of budget allocations and estimates for activities and programs identified in the second step for the transport and urban sectors. For this, an expenditure analysis framework will be used to quantify or capture budget allocation and

expenditure on climate change relevant interventions in the country. With sectoral climate relevant expenditures identified, the fourth step involves decomposing sectoral climate finance expenditures by source or origin of finance which allows estimating the relative contribution of the different sources of finance to total climate budget allocation.

Figure 2: Steps in estimating climate finance




Source: CRGE Facility (2017)

In terms of practical implementation, a layered approach will be followed. At the upper level, the entry point to identify and estimate climate related budget allocation is to look at total government expenditure. This is based on overall expenditure framework of the government which consists of both capital and recurrent expenditure. With total expenditure identified, sectoral expenditure allocations need to be captured by distinguishing both capital and recurrent expenditures.

With capital and recurrent sectoral expenditures identified, the next step is to estimate climate relevant expenditures by programs and activities for the two target sectors based on the 'national definition' of climate finance. This will provide an indication of the climate finance and investment needs of the country for the three sectors.

With the baseline climate relevant activities and expenditures identified, climate investment projection needs to be made for the GTP-II period and beyond. Since most sector ministries and institutions undertaking climate relevant activities do not have costed plans for actions to combat potentially negative climate change effects, there is little means of estimating future expenditures that might be incurred. In these cases, projections of future climate change expenditures will be mainly based on past expenditure trends. Two scenarios will be

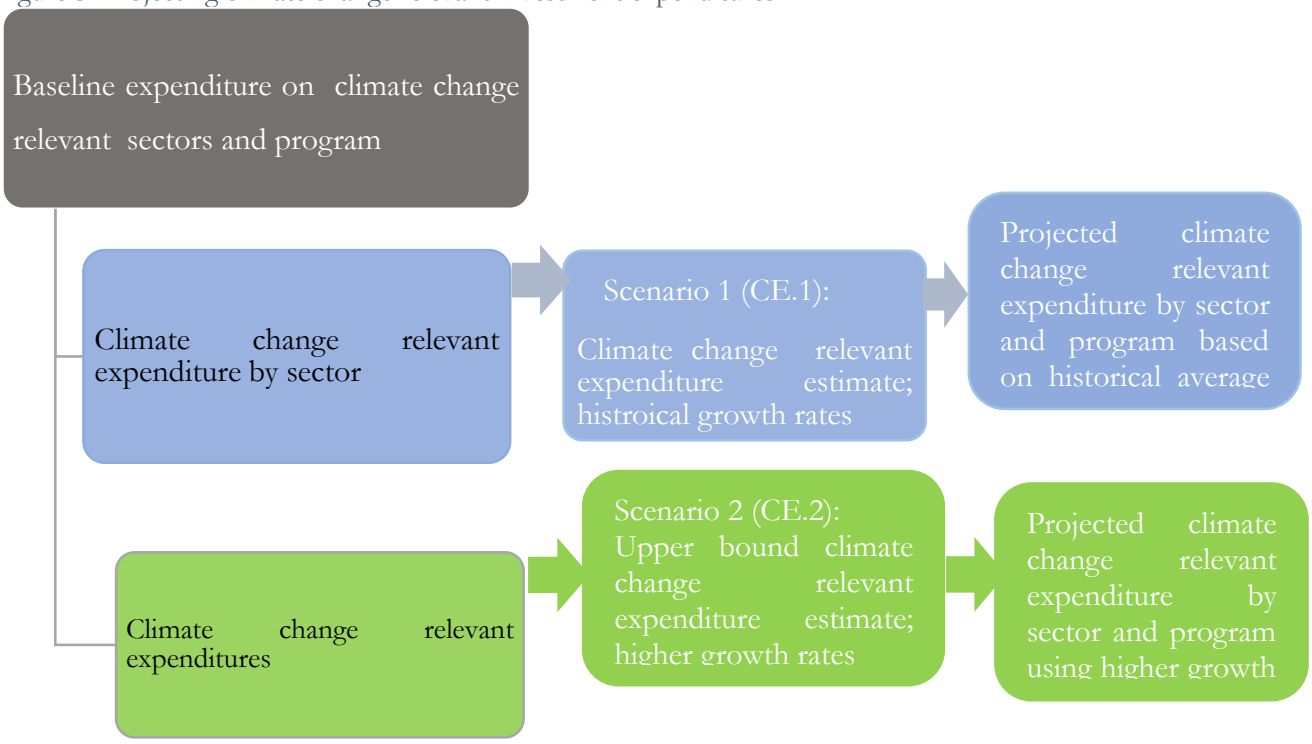
used to estimate and project climate investment expenditures between 2015/16-2029/30 (Figure 3).[7]

**Scenario 1 (CE.1)**[8]: The first scenario considers climate investment expenditures based on historical trends. This scenarios projects climate change relevant expenditures based on historical average growth rate which is assumed to hold during the projection period.

**Scenario 2 (CE.2)**: The second scenario considers a more optimistic situation by assuming that government and development partners investments in climate change related activities are expected to increase in the future. This seems a realistic assumption given that there are climate change relevant investments indicated in the recently launched national adaptation plan (NAP). This scenario captures total climate change relevant expenditures by sector and program.

[7] Sector-specific scenarios are presented in the relevant chapter of the report.
[8] 'CE' refers to scenario for *climate relevant expenditure*.

Figure 3: Projecting climate change relevant investment expenditures




Source: CRGE Facility (2017)

### 2.2.3 Data Sources

From an operational point of view, the design of the methodology has been supported by a two pronged approaches including (i) desk work, aimed at reviewing relevant literature and consolidating the information available in secondary sources, and (ii) stakeholder consultations, covering expert key informant interviews to collect data on climate relevant finance.

**Desk review:** Desk work involved the review of a wide range of studies and policy documents, including (i) reviewing and understanding the relevant government policies, strategies and plans of the government (such as the CRGE Strategy, GTP plans, and sector strategy documents particularly the CR strategies of the key CRGE Sectors), (ii) Planning and budgeting processes, (iii) Annual reports, budget allocations by source and type, and other studies on climate finance. Desk work also involves the analysis of various statistical sources and review of experience of other countries and good practice guidelines.

**Stakeholder consultations:** There are many stakeholders consulted during the development of the Climate finance tracking and projection tool. These include sector ministries such as the Ministry of Finance and Economic Cooperation (MoFEC) (CRGE Facility), Ministry of Environment, Forest and Climate Change (MFECC), Ministry of transport, Ministry of Transport, Ministry of Urban Development and Housing and other relevant sector institutions.

# 3. Country Economic and Social Context

## 3.1 Selected economic and social indicators

Ethiopia has shown improved economic and social progress. The country registered annual real GDP growth rate of 8.0 percent in 2015/16 and 10.9 percent 2016/17. In terms of sectoral growth rates, agriculture, industry and services sectors grew, respectively, by 8.7 percent, 18.7 percent and 10.3 in 2016/17. Strong economic performance led to increased income per capita and a fall in poverty. GDP per capita increased from USD 377 in 2009/10 to USD 794 in 2015/16. The national poverty level also declined from 44.2 percent in 1999/2000 to 23.4 percent in 2014/15 (NPC, 2017).[9]

## 3.2 Analysis of government expenditure[10]

The Ministry of Finance (former Ministry of Finance and Economic Cooperation (MoFEC)) publishes a comprehensive and detailed federal and regional levels budget data. The most recent audited budget data is available up to 2015/16. The data provides budget information at programme and project levels for the various ministries.

In the government expenditure system, two broad categories of expenditure components can be identified: capital[11] and recurrent[12] expenditures. Accordingly, of the total government expenditure, on average 55 percent was allocated for capital investment, while the remaining was allocated to recurrent expenditure between 2011/12 and 2016/17 (Figure 4). However, the share of capital expenditure in total expenditure has shown a declining trend in recent years: decreased from 58.7 percent in 2011/12 to 50 percent in 2016/17. On

[9] National Plan Commission (2017), The 2017 Voluntary National Reviews on SDGs of Ethiopia: Government Commitments, National Ownership and Performance Trends.

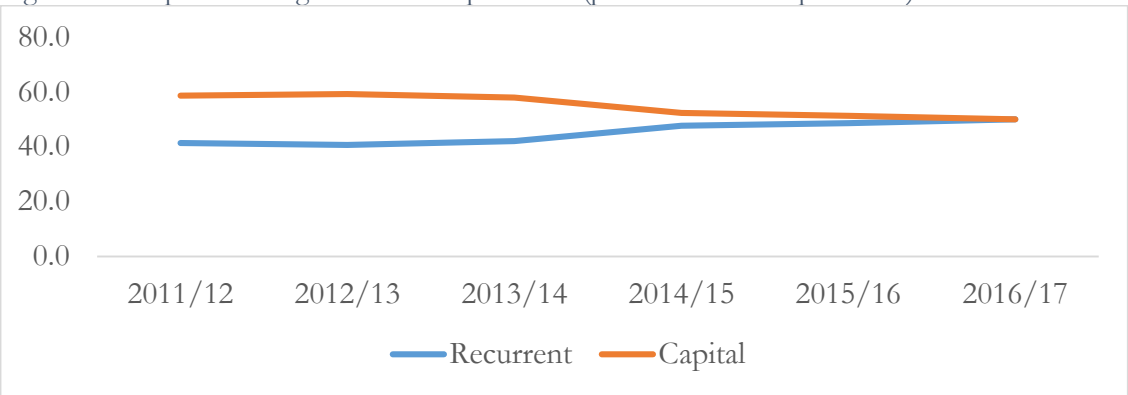
[10] Expenditure analysis is limited to the regulatory agencies such as Ministry of Transport, Ethiopian Civil Aviation Authority and Transport Authority. The Ethiopian Roads Authority is not included under the Ministry (it is included under the Ministry of Construction).

[11] The expenditure made for fixed assets like furniture and fixtures, vehicles, machinery parts and instruments etc. are known as capital costs. The capital expenditure adds fixed assets, which can be used for further production activities. Stock of assets for strategic importance and emergency use, land, buildings, roads, canals, electricity generation plant, forest plantation, mining, up gradation of projects, research study, consultation services for such capital nature of activities are also included under capital expenditure

[12] the expenditure other than capital which are annually spent by the government organizations. Such expenditure includes consumption expenditure, expenditure necessary for daily activities, the expenditure for the services for public welfare and the grants provided to the institutions responsible for such public welfare services. The interest expenses of the loan and refund expenditure also include under this heading.

the other hand, the share of recurrent expenditure increased from 41.3 percent to 50 percent over the same period. It appears that the government has allocated a large share of budget for recurrent activities in recent years. The government budget document also provides sources of financing capital expenditures for each programme and project. Three sources of finance are indicated in the published budget document: treasury, grants and loans. While recurrent expenditures are financed through treasury, capital budget is financed from a combination of treasury, grants, and loans.

Figure 4: Composition of government expenditure (percent of total expenditure)

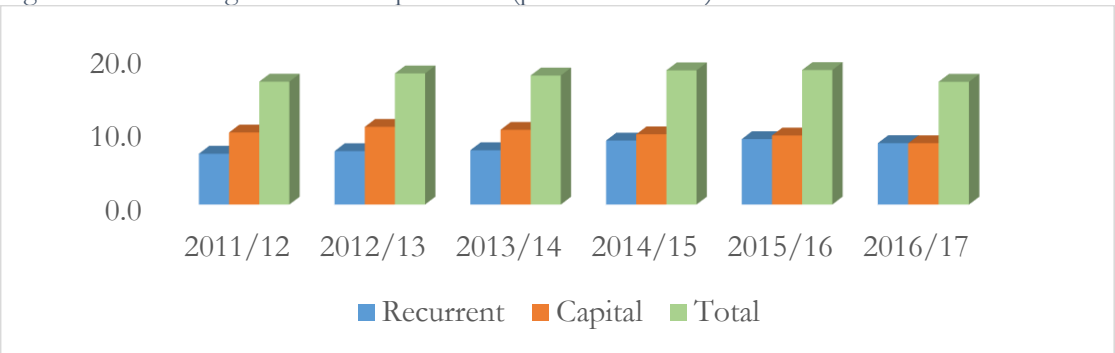



Source: Based on MoFEC data

According to government budget accounts, three broad functional classifications can be identified: economic development, social development and general services. Included in the economic development are agriculture, natural resources, trade, industry and tourism, mines and energy, transport and communication, urban development and construction, and economic development studies. Similarly, the social development component includes education and training, culture and sports, public health, labor and social welfare, rehabilitation, pension payments, interest payments and charges, and other miscellaneous. Included in the general services are organ of the state, justice, defense, public order security, and other general services. Government allocated about 70 percent of government expenditure to pro-growth and pro-poor sectors as roads, education, health, agriculture and food security, and water and sanitation, indicating government's commitment to long-term development and poverty eradication (NPC, 2015). The Government of Ethiopia also considers climate change as an economic development issue and has mainstreamed its Climate Resilient Green Economy (CRGE) Strategy into the medium-term development plan (GTP-II).

Total government expenditure as a share of GDP accounted for, on average, 17.5 percent between 2011/12 and 2016/17, with recurrent and capital expenditure accounted for 7.9 percent and 9.6 percent, respectively (Figure 5).

Figure 5: Trends in government expenditure (percent of GDP)




Source: Based on MoFEC data (for expenditure) and National Planning Commission data (for GDP)

There are three channels in MoFEC through which grants and loans are managed. First, Chanel One manages external finance that follows the government financial system and these funds are fully captured in the budget. The second channel (channel two) manages funds that are disbursed by development partners directly to sector ministries and these are also captured in the budget as sector ministries report to MoFEC. In the third category (channel three), development partners disburse funds directly to projects and programs operating outside government structures; this part of finance often does not appear in the government accounts.

# 4. Climate Finance Tracking and Projection for the Forest, Transport and Urban Sectors

## 4.1. Forest Sector Climate Change Expenditure Analysis

### 4.1 Aggregate Expenditure in the Forestry Sector

The CRGE strategy identifies the forestry sector as one of the sectors with significant potential for addressing climate change. Forests can serve as carbon capture and storage, thereby reducing the emissions of GHG; forests become part of a climate strategy for mitigation. Forest and trees can also help cope with impacts of climate change, and thus become part of a climate strategy for adaptation (ETFRN, 2009).[13] The forestry sector contributes about a fourth of projected GHG emissions levels under business-as-usual scenario and offers great abatement potential through reducing deforestation and forest degradation plus (REDD+). In doing so, Ethiopia has adopted REDD+ as a climate change mitigation mechanism for the forest sector. The REDD+ interventions focus on addressing the main drivers of deforestation and degradation: conversion to agricultural land and unsustainable fuel wood consumption. This can be achieved through increase agricultural yields, manage soils and forests better, and adopt alternative energy sources and energy efficient cooking technologies. These interventions are expected to reduce pressure of agricultural expansion on forests, reduce demand for fuel wood, and increase sequestration. These interventions will help protect and re-establish forests for their economic and ecosystem services, including as carbon stocks.

The Ethiopian government has been implementing various programs and projects related to the forest sector (Table 1). Particularly, two institutions are relevant in the case of the forestry sector: Ministry of Agriculture and Natural Resources and Ministry of Environment, Forest and Climate Change. The CRGE strategy also identified these institutions as responsible for implementing climate change related intervention in their respective domains.

[13] ETFRN (2009), Forest and Climate Change: Adaptation and mitigation, European Tropical Forest Research Network (ETFRN), Issue No.50.

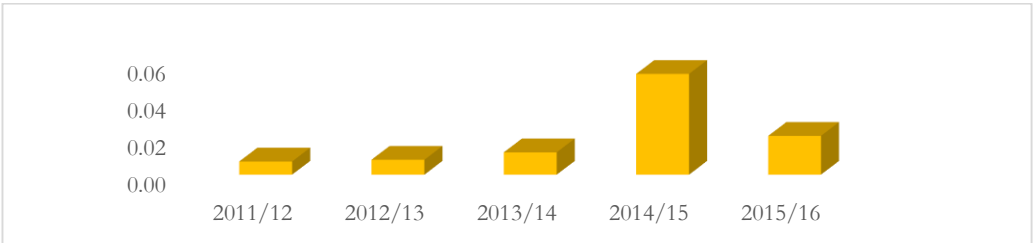
*Table 1*: Examples of forest related programs and projects

| | |
|---|---|
| Forest Resource and Environment Protection Program | Wood Products Utilization Research |
| Forest Development and Conservation Program | Natural Forest Research |
| Participatory Forest Management Project | Forest Technology |
| Eastern Africa Bamboo Development Project | Forest Management and Administration |
| Plantation and Agroforestry Research | Reducing Emissions from Deforestation |
| Non-timber Forest Products Utilization Research | Forest and climate change |
| Forest Preservation Program | Climate Resilient Green Economy Program |
| African Climate change Adaptation Program | Policy and Law Formulation for Green Economy |

Source: Extracted from published MoFEC's document

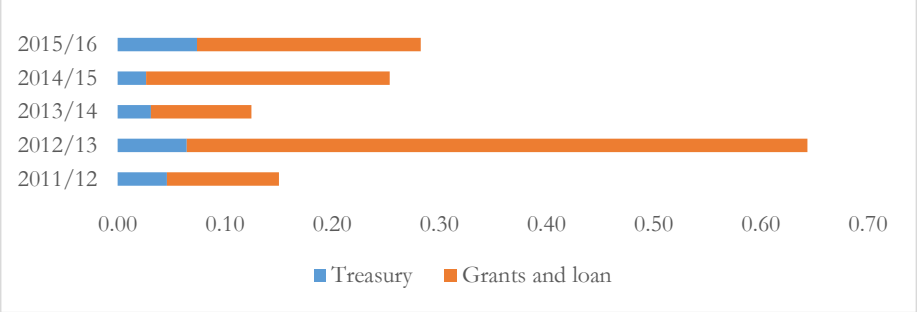
Recurrent expenditure allocated to forest has increased from ETB 3.6 million in 2011/12 to ETB 31.5 million in 2015/16, grew by about 71 percent. In relative terms, recurrent expenditure on forest increased from 0.01 percent of total recurrent expenditure in 2011/12 to 0.02 percent in 2015/16 (Figure 6). The share of capital budget allocated to the forest sector has also increased from ETB 192.9 million to ETB 413.3 million over the same period; it grew by about 12 percent per year. Recurrent expenditures are fully financed through domestic budget. Capital expenditure on forest as a share of total capital expenditure increased from 0.26 per to 0.29 percent. External sources in the form of grants and loans financed a large share (more than 80 percent) of capital expenditure between 2012/13 and 2015/16 (Figure 7). The share of government finance from treasury increased from 17.5 percent in 2012/13 to 20.5 percent in 2015/16. This indicates that capital expenditure on forest heavily depends on external sources of finance.

*Figure 6*: Share of recurrent expenditure forest (% of total recurrent expenditure)




Source: Based on MoFEC data

Figure 7: Structure of forest capital expenditure (% of total capital expenditure)




Source: Based on MoFEC data

### 4.1.2 Climate change expenditure in the forestry sector

In this report, climate expenditure/climate-related expenditure refers to expenditures dedicated to mitigation and/or adaptation measures. Not all expenditures are spent on climate change activities as expenditures on programs/projects are in part addressed to ameliorating adverse climate change impacts. This indicates that expenditures in some programs/projects are fully considered as climate related, while in others are counted partially climate related. The CRGE strategy and NAP provide guidance on climate change relevance of interventions. Accordingly, interventions related to the forestry sector are climate change relevant from both adaptation and mitigation perspectives. There are programs and projects for which there is no explicit reference to the forest related expenditure as the forestry sector has been treated as part of the broader natural resources management. As indicated earlier, in programs and projects where there is no specific information on forest related activities, it is assumed that climate related expenditures on forests account on average 40 percent of total expenditure.

The overall size of the federal budget for the forestry sector in nominal terms increased from ETB 113.3 million in 2011/12 to ETB 436.2 million in 2015/16, indicating an average annual growth rate of 31 percent. This growth in expenditures was only marginally higher than the average annual inflation rate during the period. Comparison of climate change-relevant expenditure with GDP shows climate change-related expenditures in the forest sector as a share of GDP has not increased substantially between 2011/12 and 2015/16; the share of forest expenditure as a share of GDP remained unchanged in 2014/15 and 2015/16 despite the expansion in GDP.

Table 2: Overview of the climate change budget for the forestry sector, 2011/12–2015/16

| | Climate change relevant expenditure | Inflation rate | Share in GDP |
|---|---|---|---|
| 2011/12 | 113.31 | 34.1 | 0.02 |
| 2012/13 | 592.29 | 13.5 | 0.07 |
| 2013/14 | 143.23 | 8.1 | 0.01 |
| 2014/15 | 356.49 | 7.7 | 0.03 |
| 2015/16 | 436.22 | 9.7 | 0.03 |

Source: National Bank of Ethiopia for inflation; MoFEC's database for budget; and National Planning Commission for GDP

Although a large share of capital expenditure on forests is financed through external sources, the Ethiopian government has also allocated budget to both recurrent and capital expenditures. Capital expenditure from treasury increased from ETB 33.6 million in 2011/12 to ETB 106.4 million in 2015/16, representing a growth rate of 26 percent per year (Table 3). The share of treasury or budget in total forest climate related expenditure was 31 percent in 2015/16. However, this figure does not include the value of community contributions to forest development. Ethiopia is known for its massive mass mobilization efforts in the area of natural resource conservation. However, the inputs of communities have not been estimated so far.

Table 3: Government climate related expenditure on forests (Million ETB)

| | Recurrent | Capital | Total | Share from total expenditure on forests |
|---|---|---|---|---|
| 2011/12 | 3.62 | 33.57 | 37.19 | 32.8 |
| 2012/13 | 5.00 | 58.87 | 63.88 | 10.8 |
| 2013/14 | 9.32 | 33.16 | 42.49 | 29.7 |
| 2014/15 | 57.69 | 31.23 | 88.92 | 24.9 |
| 2015/16 | 28.34 | 106.42 | 134.76 | 30.9 |

### 4.1.3 Identifying, classifying and assessing climate relevance

This sub-section provides more detail on the manner in which expenditure line items have been selected and analysed. Budget data is often presented in terms of short descriptions for line items.

Three steps are involved in quantifying relevance of climate related expenditures. The first step involves identification and collection of projects that are related to the forestry sector.

This is simply generating list of climate change relevant programs/projects. The identification of budget lines with climate related expenditures followed the definition of two key elements of climate change: adaptation and mitigation (Bird *et al.*, 2012). Thus projects under the forestry sector are intended to:

- improve resistance or resilience to present and future climate change by protecting against negative effects, and/or
- reduce resource inputs and GHG emissions substitution and carbon sequestration

In addition, other programs/projects that support the delivery of climate change actions have been included since there are interventions that relate to climate change and the creation of a governance and delivery platform. These could include capacity building, institutional strengthening, ecosystem inventories, climate change negotiations, and reform process. The supporting areas themes do not deliver direct adaptation or mitigation benefits. Note that some projects could have both adaptation and mitigation components, creating the theme of A/M.

In the second step, programs/projects identified in the first step are classified using a set of activities determined from the national climate change policy perspective. This helps create a linkage between CRGE objectives and the classification of budget items. Accordingly, projects and activities can be divided into four themes: adaptation, mitigation, A/M and supporting areas.

Table 4: Typology of themes in the forestry sector

| **Theme** | **Relevant activities** | |
|---|---|---|
| Adaptation (A), or A/M | Awareness raising | Adaptive capacity enhancement |
| | Research | Forest management |
| | Reforms in governance | |
| Mitigation (M), or A/M | Policy and governance | Reforestation |
| | Access to international carbon financing | International and regional cooperation (e.g. climate change negotiations, and cooperation in research and development) |
| Supporting areas | Capacity building and institutional strengthening | Finance and technology transfer (e.g. Climate financing and Technology transfers) |

| | |
|---|---|
| | Awareness raising and education |

The third step determines the climate relevance of expenditures in terms of high medium, low and marginal relevance. This helps rank projects from highly-relevant (75 percent+ of expenditure line item predicated on climate change) to marginally relevant (< 25 percent) items.

Table 5: Climate classification

| Relevance | Rational | Weight (%) | Examples |
|---|---|---|---|
| High | Clear primary objective of delivering specific outcomes that improve climate resilience or contribute to mitigation | ≥ 75 | • Forestation and conservation of protected areas<br>• Building institutional capacity to plan and manage climate change<br>• Climate change awareness raising |
| Medium | Either (i) secondary objectives related to building climate resilience or contributing to mitigation, or (ii) mixed programs with a range of activities that are not easily separated but include at least some that promote climate resilience or mitigation | Between 50 and 74 | • Forestry and agro-forestry that is motivated primarily by economic or conservation objectives, because this will have some mitigation effect.<br>• Education and research in the sector |
| Low | Activities that display attributes where indirect adaptation and mitigation benefits may arise | Between 25 and 49 | • General planning capacity enhancement (not explicitly linked to climate change)<br>• Livelihood and social protection programs motivated by poverty reduction<br>• Food security, drought recovery and satellite programs |
| Marginal | Activities that have only very indirect and theoretical links to climate resilience | Less than 25 | • International trade promotion<br>• Education and research initiatives that do not have an explicit climate change element |

### 4.1.4 Climate expenditures by theme and relevance

Between 2011/12 and 2015/16, about 62 percent of climate budget in forests was spent in activities that involved both adaptation and mitigation themes, indicating that the increasing roles of forest for both adaptation and mitigation purposes. The share of climate budget on both adaptation and mitigation increased from 63 percent of total climate related budget in 2011/12 to 83.7 percent in 2015/16 (Figure 8). In 2012/13, climate change related federal expenditures on forests were related mainly to the adaptation theme, with supporting

activities making up just 0.50 percent and increased to 6.9 percent in 2015/16. Average spending in supporting areas accounted for 5.3 percent in 2011/12-2015/16. The increasing focus on both adaptation and mitigation is in coherent with Ethiopia's low level of development and high levels of deforestation.

Figure 8: Climate related expenditure by theme (Percent of total climate related expenditure)

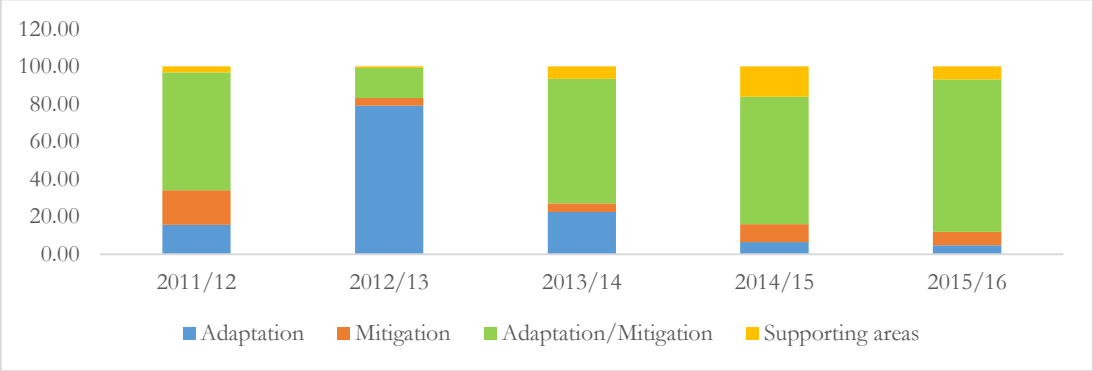
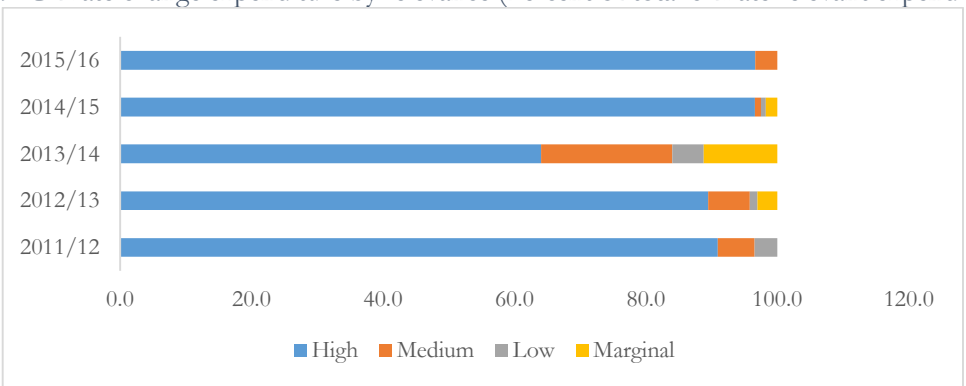



Figure 9 presents a summary of total climate change-relevant expenditure by relevance (high, medium low and marginal). Looking into the total magnitude of the expenditure on forests, not surprisingly, expenditures concentrate on high relevant climate change programs/projects. High relevant climate change expenditures accounted for about 88.1 percent of total climate change expenditure between 2011/12 and 2015/16, followed by medium relevant climate change expenditures with just 6.6 percent share of total expenditure. Low and marginal relevant climate change activities expenditure accounted for 2 and 3 percent of total climate relevant spending, respectively.

Figure 9: Climate change expenditure by relevance (Percent of total climate relevant expenditure)




### 4.1.5 Forest related donor financed climate change projects

Ethiopia receives a significant amount of climate change finance from bilateral (e.g. Norway, Sweden, UK, Denmark, etc.) and multilateral institutions (e.g. World Bank and Africa Development Bank). Ethiopia has received a total of USD 2.33 billion to finance various climate related initiatives since 2010. These initiatives take the form of adaptation, mitigation, both adaptation and mitigation and capacity building activities (Table 6). Some of these projects have already been completed, while others are ongoing. These data on donor financed projects represent a significant amount of funding for climate-related activity in the country. The projects cover different sectors such as agriculture, forest, energy, and cross-cutting issues such as capacity building, which in a way support the Ethiopia's goal of building a carbon neutral economy by 2025. Ethiopia received financial support close to USD 1.9 million to support the forest related interventions since 2010. In some programs/projects such as SLM and climate smart integrated rural development, the support to the forestry accounts for a fraction of total fund. For instance, in the case of SLM, the forestry sector accounts for 40 percent of the total fund.

Table 6: Selected donor-financed forest related programs and projects since 2010

| | Amount (in million USD) |
|---|---|
| Sustainable Land Management program | 183.8 |
| Forest Preservation Program | 18.8 |
| Scaling up of participatory forest management (PFM) | 8.9 |
| Reducing Emission from Deforestation and Forest Degradation (REDD) | 3.4 |
| CRGE Program Support | 10.0 |
| GEF grant to community based integrated natural resource management project (CBINRMP) | 4.4 |
| Community based integrated natural resources management project | 19.4 |
| Oromia REDD+ pilot program | 8.0 |
| REDD+ RPP implementation support | 10.0 |
| Advisory service support to the CRGE Facility | 5.0 |
| Implementation of Fast Track-CRGE Projects in Six Ministries | 25.0 |
| Institutional Strengthening of the Forest Sector in MEFCC | 10.6 |
| Climate Smart Integrated Rural Development Project | 10.0 |
| Multi-Sector Investment Planning (MSIP) for climate Resilience Project | 1500 |
| Enhanced Management and Enforcement of Ethiopia's Protected Area Estate | 7.3 |
| Integrated Landscape Management to Enhance Food Security and Ecosystem Resilience in Ethiopia | 10.3 |
| Italy Government: Project proposal/concept note for CLIMATE SMART INTEGRATED RURAL DEVELOPMENT PROJECT | 4.3 |
| Africa Union Project proposal on increasing resilience to climate change through restoring degraded ecosystem and alternatives livelihoods in the catchment of rift valley Rift valley basin in SNNPR | 0.5 |
| Operationalizing Green Economy | 0.16 |

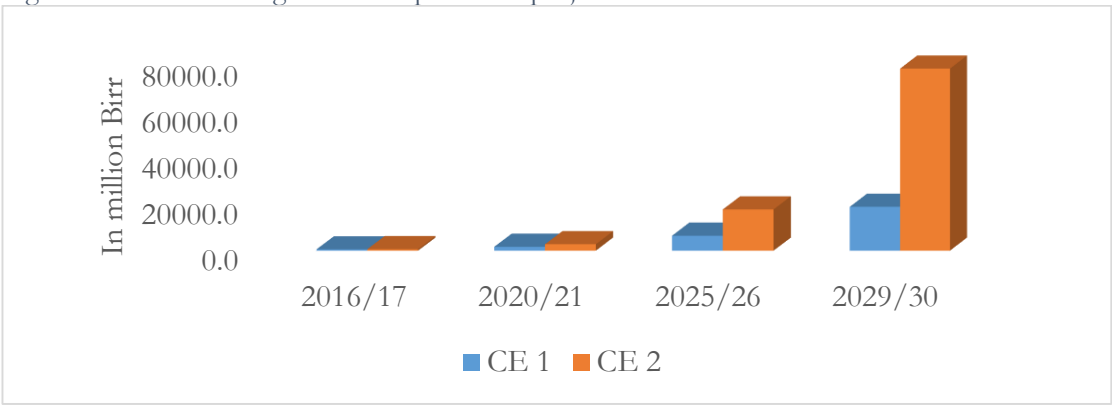
| | |
|---|---|
| REDD+ Readiness | 13.6 |
| Oromia Forest Landscape Project | 68 |
| Bonga Biosphere Reserve Project | 1.00 |
| Institutional Strengthen for the Forest Sector Development in Ethiopia(ISFDP) | 6.5 |
| Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities | 5.0 |
| Total | 1.93 |

Source: MoFEC

### 4.1.6 Projecting climate change related expenditure for the forestry sector

The projection scenarios indicate that climate change related expenditure would increase from ETB 571.2 million in 2016/17 to ETB 190.1 billion in 2029/30 in the first scenario (Figure 10). In this scenario (CE 1), climate change expenditure in the forestry sector will be ETB 1.28 billion in 2019/20 (end of GTP-II period) and ETB 4.9 billion in 2024/25 (end of GTP-III period). In the optimistic scenario (CE 2), climate change related expenditure in the forestry sector would increase to ETB 78.8 billion in 2029/30. By the end GTP-II and GTP-III, it will be ETB 1.9 billion and ETB 12.3 billion, respectively. This requires mobilizing resources to finance this growing climate change related expenditures in the years to come. Financial resources can be mobilized from both domestic and external sources (see supply of finance projection).

Figure 10: Climate change related expenditure projection



## 4.2. Climate Finance Analysis for the Transport Sector

### 4.2.1 Background

The transport is responsible for nearly half of all energy-related nitrogen oxide emissions (IEA, 2016), and 20-30 percent of all other air pollutants (i.e. non-methane volatile organic compounds, Sulphur oxide (SOx), carbon dioxide (CO2), and particulate matter (PM2.5 and PM10) (IRENA, 2016) globally.

The recent GHG inventory assessment of the transport sector in Ethiopia indicates that emissions from the sector increased from 6.4 Mt CO2e in 2014 to 12.8 Mt CO2e in 2016 (Ministry of Transport, 2018). The road transport accounted for over 90 percent of total transport sector emissions between 2014 and 2016. Other modes of transport such as off road, domestic air transport, inland water transport and railway transport (Ethio-Djibouti railway) have minor contributions to total transport sector emission compared to road transport. Under the business usual Scenario (i.e. assuming if no new mitigation measures are implemented between 2017 and 2030), emission from the transport sector will grow from 12.8 Mt CO2e in 2016 to 54.3 Mt Co2e by 2030, significantly higher than that estimated under the CRGE strategy (Ministry of Transport, 2018). Under the BAU scenario, the emission from the sector will grow by around 11 percent annually. In monetary terms, under the BAU scenario, climate change could lead to escalating recovery and maintenance costs ranging between US$10 million to US$21 million (FDRE, n.d.) per year. There are also indirect costs associated with climate change such as through disruption in the transportation system and its related sectors, such as agriculture and industry, ultimately affecting communities that become disconnected and face food insecurity and the disruption of basic services.

The CRGE Strategy and Ethiopia's NDC have identified the following adaption actions in the transport sector.

- Climate proofing of the transport infrastructure
- Updating and implementing transport codes, policies and regulations
- Rehabilitation and maintenance of critical road and transport infrastructure
- Resilient planning informed by climate projection data

- Develop and upscale inland waterway transport systems
- Put in place early warning systems to safeguard transport infrastructure
- To undertake risk assessment and risk reduction measures to increase the resilience of transport infrastructure

The three most common mitigation actions in the transport sector are: the acquisition of hybrid mass rapid transportation systems; the promotion of a shift from fossil fuel powered transport to low carbon biofuels and policy formation; and legislation on and implementation of transport codes and low carbon emissions standards. There are also other mitigation actions which are crucial for transforming the sector. Some mitigation actions in the transport sector include the following.

- Fuel and energy efficiency in transportation
- Upgrading existing or developing new and modern infrastructure
- Import regulation for vehicles acquisitions
- Optimal national or regional land use planning
- Setting up emission monitoring centres and emissions detectors in vehicles
- Switch to renewable energy to power transport sector
- Developing and promoting inland water transport systems
- Switching to electric transport
- National accounting for emissions in transport
- Creating awareness of modern and low carbon transport.

### 4.2.2 Climate change related initiatives in the transport sector

The Climate Resilient Green Economy Strategy (2011), Climate Resilient Transport Sector Strategy (CRTSS) ) (2014) and National Adaptation Plan of Ethiopia (NAP-ETH) (2017) identify specific climate-smart initiatives in the transport sector. Leap-frogging to modern and energy-efficient technologies in transport, industrial sectors, and buildings (FDRE, 2011). Similarly, NAP-ETH also identifies building sustainable transport system as one of the key adaptation options in Ethiopia. This adaptation option emphasizes protecting and improving the lifespan of transport infrastructure through, among other things, reviewing transportation design and safety standards, implementation of adaptation-oriented asset management systems, and development of adequate transport system to facilitate movement

of aid and support to climate change-affected communities (FDRE, 2017). The NAP identifies specific activities for the transport sector, including development of sustainable transport infrastructure design system, with consideration of climate change impacts, enhancing climate-vulnerable transportation infrastructure, and creation of adaptive transport system. Among the activities likely to be identified as adaptation interventions are: (a) Review of design and safety standards; (b) Incorporation of adaptation considerations into infrastructure asset management systems; (d) Emergency preparedness planning; and (e) Revised planning and project development documentation.

The CRTSS also aims to deliver an integrated, modern transport system with a strong focus on multi modal transportation links and a customer service (Ministry of Transport, 2014). The key desired outcomes of the CRTSS by 2030 include the following:

- Improved coordination of transport sector plans and results;
- Improved public transport accessibility and safety;
- Reduced exposure to the negative impacts of transport pollution on human health;
- Increased non- motorized transport mode use in urban areas;
- Reduced greenhouse gas (GHG) emissions from the transport system and network;
- Improved public transport links to and between higher density growth centers identified; and
- Improved value for money from transport investment

To achieve these outcomes, the CRTSS identifies a planned and coordinated set of aspirational targets and actions. The focus is on the three aspects of the transport system that drive its use and shape its long-term sustainability: freight transport plan, urban mobility and transport plans, and integrated modal delivery plans. The key climate smart intervention activities as identified in the CRTSS include the following.

- Introduce stricter fuel efficiency standards for passenger and cargo transportation;
- Impose age limits for second hand used vehicles imported;
- Promote hybrid and electric vehicles to counter the low efficiency of the existing vehicle fleet;
- Construct an electric rail network– powered by renewable energy – to substitute road freight transport;

- Improve urban transport in all urban centers of the country by introducing urban electric rail, light rail transit, introduce bus rapid transit, and improve bus operation system;
- Substitute imported fossil fuels with domestically produced biodiesel and bio-ethanol; and
- Promote walking and cycling in all urban centers.

The CRTSS encourages investments in the transport sector that can contribute to an increase in the modal share of cleaner transport modes for both GHG considerations as well as safety, congestion and overall efficiency of Ethiopia's transport system. Four categories of abatement levers for the transport sector have been identified, namely improving the public transport system in all urban areas of the country, improving vehicle fuel efficiency, changing the fuel mix and constructing an electric rail network for efficient freight transport.

The various activities envisaged under the CRTSS involve a combination of adaptation and mitigation interventions. In the context of the transport sector, adaptation involves actions that ensure that the infrastructure can better withstand the physical impacts of climate change. Similarly, mitigation action in the transport sector involves action to reduce the volume of emissions resulting from the use of road, rail, shipping and air transport. Note that the relative significance of different climate factors varies depending on type of sub-sectors, such as roads, rail and air, as these subsectors have different types and ages of infrastructure.

Table 7: Selected mitigation interventions in the transport sector

| Air transport | Rail Transport | Road Transport | Urban Transport |
|---|---|---|---|
| Emission Capping | Improving aerodynamics & reduction of train weight | Vehicle registration tax | Improving traffic flow |
| Emissions Trading Scheme | Regenerative braking | Toll road pricing | Parking policy |
| Jet fuel taxation | On-board energy storage | Road tax vignette | Transit-oriented development |
| Surface emissions, terminal and technical support facilities and infrastructure | Energy efficient driving and efficient matching of rail stock | Natural gas (conversion) | |
| Improved airplane, and airport operating procedures | | Natural gas (system) | |

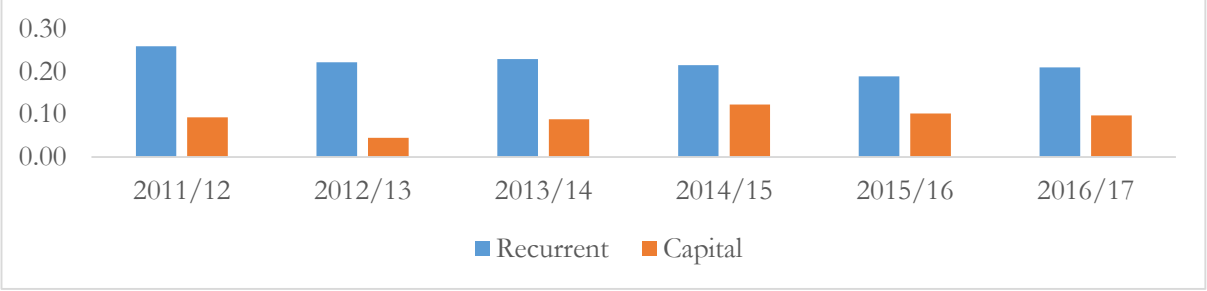
| | | |
|---|---|---|
| Improved air traffic management | | Lower emission freight vehicles<br>Clean fleets<br>Improving freight efficiency<br>Material properties of paved surfaces |

Source: Ministry of Transport (2014)

### 4.2.2 Transport Sector expenditure

According to government budget accounts, three broad functional budget classifications can be identified: economic development, social development and general services. Included in the economic development are agriculture, natural resources, trade, industry and tourism, mines and energy, transport and communication, urban development and construction, and economic development studies. The transport sector falls under the economic development budget classifications of the federal government of Ethiopia and the Integrated budget expenditure (IBEX) system can generate expenditures specific to the transport sector. Accordingly, recurrent expenditure allocated to the transport sector was ETB 133.3 million in 2011/12. This allocation increased to ETB 315.3 million in 2016/17, which shows about 19 percent per year. The share of capital budget allocated to the transport sector has also increased from ETB 67.9 million to ETB 145.9 million over the same period. It is important to note that recurrent expenditures as a whole are financed through domestic budget. Capital expenditure allocated to the transport sector as a share of total capital expenditure increased from 0.09 percent in 2011/12 to 0.10 percent in 2016/17 (Figure 11). The share of government finance from treasury accounted for a larger proportion of capital expenditure, indicating that capital expenditure on the transport sector heavily depends on internal sources of finance.

Figure 11: Share of recurrent expenditure on transport sector (percent of total recurrent and capital expenditure)




Source: Based on MoFEC data

### 4.2.3 Climate change expenditure in the transport sector

The overall size of the government budget for the transport sector in nominal terms increased from ETB 201.2 million in 2011/12 to ETB 461.4 million in 2016/17, indicating an average annual growth rate of 16.5 percent (Table 7). This growth in expenditures was only marginally higher than the average annual inflation rate during the period. Comparison of climate change-relevant expenditure with GDP shows climate change-related expenditures on transport sector as a share of GDP has not increased substantially between 2011/12 and 2016/17; the share of transport sector expenditure as a share of GDP remained unchanged despite expansion in GDP.

Table 8: Overview of the climate change budget for the transport sector

| | Climate change relevant expenditure (Million birr) | Inflation rate | Share in GDP (Percent) |
|---|---|---|---|
| 2011/12 | 201.20 | 34.1 | 0.03 |
| 2012/13 | 180.48 | 13.5 | 0.02 |
| 2013/14 | 274.49 | 8.1 | 0.03 |
| 2014/15 | 374.87 | 7.7 | 0.03 |
| 2015/16 | 405.89 | 9.7 | 0.03 |
| 2016/17 | 461.24 | 7.2 | 0.03 |

Source: National Bank of Ethiopia for inflation; MoFEC's database for budget; and National Planning Commission for GDP

### 4.2.4 Identifying, classifying and assessing climate relevance

This sub-section provides more detail on the manner in which expenditure line items have been selected and analysed for the transport sector. Government budget data from the integrated budget expenditure system is often presented in the form of short descriptions for line items.

Three steps are involved in quantifying relevance of climate related expenditures. The first step involves identification and collection of programmes and projects that are related to the transport sector. The identification of activities with climate related expenditures followed the definition of two key elements of climate change: adaptation (A) and mitigation (M). Recent literature on climate finance tracking also includes other programmes/projects that support the delivery of climate change actions such as capacity enhancement, institutional strengthening, awareness raising, research and technology transfer, and reform

process. Some projects could also have both adaptation and mitigation components, creating the theme of A/M. For example, the development of urban public mass transport systems (*mitigation*) in riverine or coastal areas on raised platforms to maintain functionality during times of floods or inundation events (*adaptation*) (UNDP, 2015).[14]

In the second step, programs/projects identified in the first step are classified using a set of activities determined from the national climate change policy perspective. At this stage, the relevant entry points are projects and activities to create a linkage between CRGE objectives and the classification of budget items. Accordingly, projects and activities can be divided into four themes: adaptation (A), mitigation (M), A/M and supporting areas (SA) (Table 8).

Table 9: Typology of themes in the transport sector

| **Theme** | **Relevant activities** | |
|---|---|---|
| Adaptation (A), or A/M | Building local roads and bridges in flood-prone areas | |
| | Increasing the capacity of road drainage | |
| | Increasing the span of a bridge to avoid sections of river bank to withstand peak river flows | |
| Mitigation (M), or A/M | General transportation | Inland waterway transport and ports and shipping |
| | Research and development | Railways |
| | Aviation | Urban transport |
| | Rural and inter-urban roads and highways | |
| Supporting areas | Capacity building and institutional strengthening | Finance and technology transfer (e.g. Climate financing and Technology transfers) |
| | Awareness raising and education | |

[14] UNDP (2015), Pakistan Climate Public Expenditure and Institutional Review (CPIER), UNDP Bangkok Regional Hub.

The third step determines the climate relevance of expenditures in terms of high medium, low and marginal relevance. This helps rank projects from highly-relevant (75 percent+ of expenditure line item predicated on climate change) to marginally relevant (< 25 percent) items (Table 9).

Table 10: Climate change activities by relevance

| Relevance | Rational | Weight (%) | Examples |
|---|---|---|---|
| High | Clear primary objective of delivering specific outcomes that improve climate resilience or contribute to mitigation | ≥ 75 | • Updating and implementing transport codes, policies and regulations |
| Medium | Either (i) secondary objectives related to building climate resilience or contributing to mitigation, or (ii) mixed programmes with a range of activities that are not easily separated but include at least some that promote climate resilience or mitigation | Between 50 and 74 | • Education and research in the sector |
| Low | Activities that display attributes where indirect adaptation and mitigation benefits may arise | Between 25 and 49 | • Road construction with identifiable elements of climate proofing.<br>• Strengthening, improvement and rehabilitation of road infrastructure. Road and bridges reducing distances travelled. Roads in difficult areas- mountain areas, coastal areas.<br>• Mass transit systems, railways.<br>• Bridges over rivers, reducing distances. |
| Marginal | Activities that have only very indirect and theoretical links to climate resilience | Less than 25 | • Research initiatives that do not have an explicit climate change element<br>• Road investment with no particular climate proofing. |

### *4.2.5 Climate expenditures by theme and relevance for the Transport Sector*

Between 2011/12 and 2016/17, about 52.3 percent of climate budget in the transport sector was spent in activities that involved mitigation. The share of climate budget on mitigation increased from 42 percent of total climate related budget in 2011/12 to 71.7 percent in 2016/17 (Figure 12). Similarly, on average 38.3 percent of climate-related government expenditure on transport sector was mainly to supporting activities, with adaptation related expenditure accounted for under 3.0 percent. The increasing focus on mitigation is in coherent with Ethiopia's rapidly growing transportation system, especially the road transport which accounted for a significant share of GHG emissions.

Figure12: Climate related expenditure by theme (Percent of total climate related expenditure)

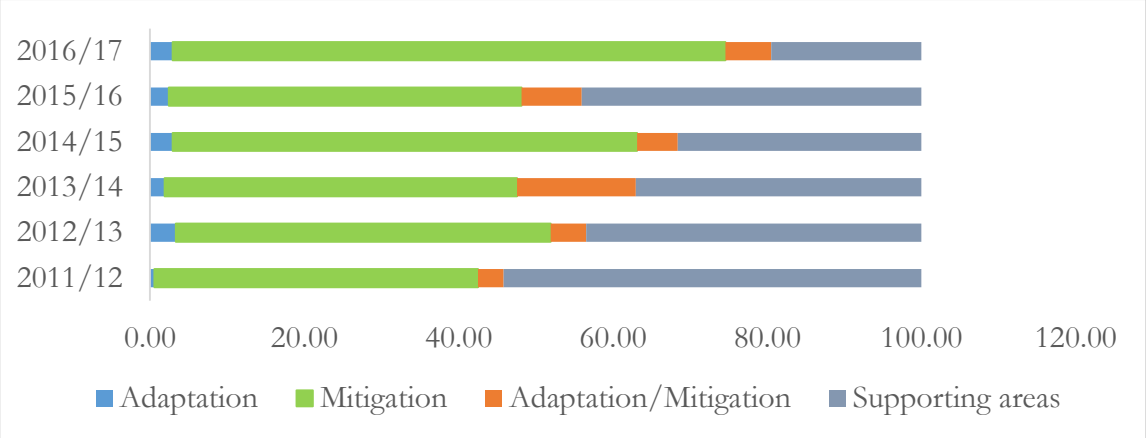
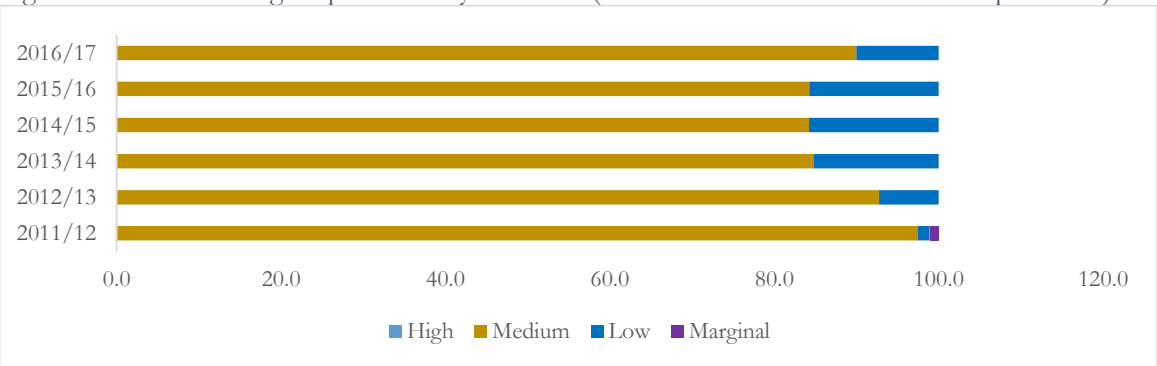



Figure 13 presents a summary of total climate change-relevant expenditure by relevance (high, medium low and marginal). Expenditures concentrate on medium relevant climate change programs/projects and activities (Figure 13). Medium relevant climate change expenditures accounted for about 88.9 percent of total climate change expenditure between 2011/12 and 2016/17, followed by low relevant climate change expenditures, accounting for 10.9 percent of total expenditure. High and marginal relevant climate change activities expenditure accounted for a negligible share of total climate relevant spending in the transport sector.

Figure 13: Climate change expenditure by relevance (Percent of total climate relevant expenditure)



### 4.2.6 Projecting climate change related expenditure for the transport sector

#### 4.2.6.1 Methodological note

The main entry points for forecasting climate related expenditures in the transport sector are the CRGE strategy, CRTSS, NAP and GTP-II. These documents provide not only current interventions but also climate related investments in the future. For instance, the CRTSS provides a framework for investment in the transport sector for 2030. It consists of activities aimed to build resilience (adaptation) and mitigation. This provide the basis for projecting climate relevant activities and expenditures for the GTP-II period and beyond. Four categories of abatement levers for the transport sector have been identified, namely improving the public transport system in all urban areas of the country, improving vehicle fuel efficiency, changing the fuel mix and constructing an electric rail network for efficient freight transport. According to the CRTSS, the largest initiatives, with the greatest abatement potential, are the construction of an electric rail network (8.9 Mt CO2e) followed by the introduction of fuel efficiency standards for all vehicles (3 Mt CO2e). This requires construction of more than 5,000 km of rail tracks and enforcement of new fuel efficiency standards for 30% of passenger vehicles and 10 percent of freight vehicles by 2030 (Ministry of Transport, 2014). The introduction of bio-fuels (ethanol and biodiesel) also forms a priority, though its abatement potential is much lower (1 Mt CO2e). This indicates significant investment in the transport sector in the future.

Given that there is paucity of adequate information on costed plans, there is little means of estimating future expenditures that might be incurred. In these cases, projections of future climate change expenditures will be mainly based on past expenditure trends. Accordingly, two scenarios were used to estimate and project climate investment expenditures in the transport sector between 2015/16-2029/30.

**Scenario 1 ($S_{tr}$-1)**[15]: The first scenario considers climate investment expenditures based on historical trends of the transport sector. This scenarios projects climate change relevant expenditures based on historical average growth rate of the transport sector which is 14.6 percent per year.

[15] '$S_{tr}$' refers to scenario for the transport sector.

**Scenario 2 ($S_{tr}$-2)**: The second scenario considers a more optimistic situation by assuming that government and development partners investments in the transport sector will increase between 2016/17 and 2030/31. This seems a more realistic assumption given that there are climate change relevant investments indicated in the recently launched NAP and CRTSS. This scenario assumes a growth rate of the most recent years (between 2013/14 and 2016/17) which is 29.6 percent.

#### 4.2.6.2 Analysis of expenditure projection

In forecasting climate change financing needs for the transport sector, three phases are considered: GTP-II (2015/16-2019/20), GTP-III (2020/21-2025/26) and GTP-IV (2026/27-2029/30). Note that the forecast is made from 2017/18 onwards, as information on actual financing needs and expenditures related to climate change are available before 2017/18. The projection scenarios indicate that climate change related expenditure in the transport sector would increase from ETB 529.6 million in 2017/18 to ETB 698.4 billion in 2019/20(end of GTP-II period) in the first scenario (Figure 14). In this scenario (S-1), climate change expenditure in the transport sector would increase to ETB 1.4 billion in 2024/25 (end of GTP-III period) and ETB 2.8 billion in GTP-IV (2029/30) (Figure 15 and Figure 16). In the optimistic scenario (S-2), climate change related expenditure in the transport sector would increase to ETB 1.0, 3.7 and 13.5 billion by the end of GTP-II, GTP-III and GTP-IV, respectively. Climate change related financing needs would significantly increase during GTP-III and GTP-IV due to government's ambition of making the sector green and clean. This indicates that a large amount of financial and non-financial resources are required to achieve the adaptation and mitigation goals of the sector.

Figure 14: Climate change related financing needs projection, 2017/18-2019/20

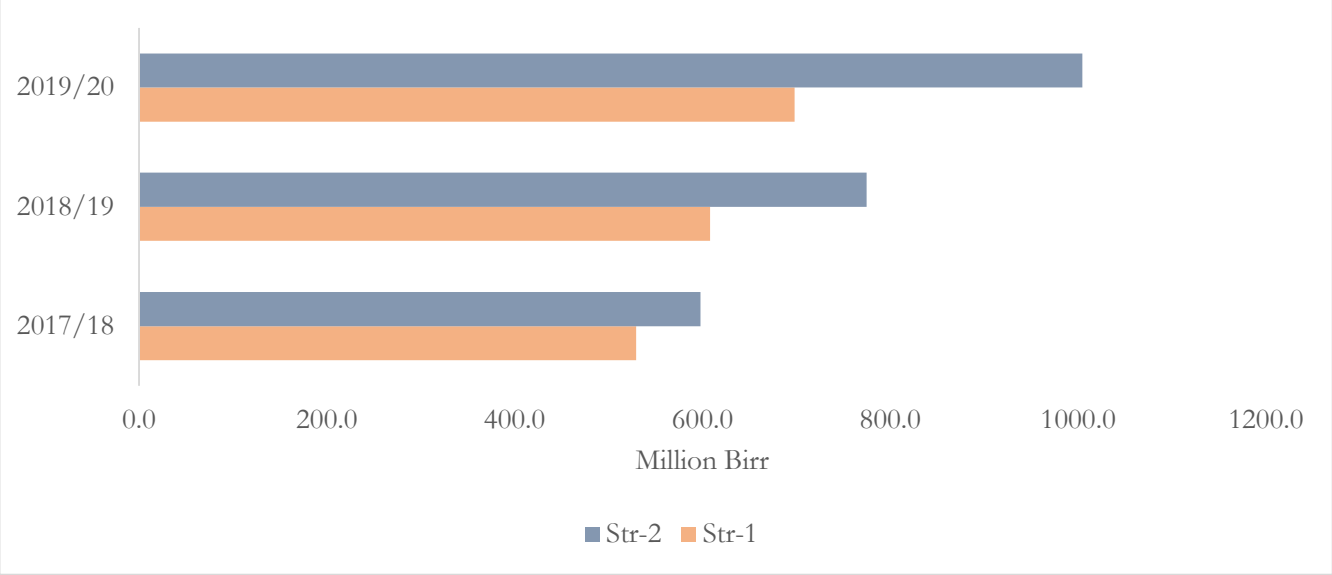



Figure 15: Climate change related financing needs projection for the transport sector, 2020/21-2024/25

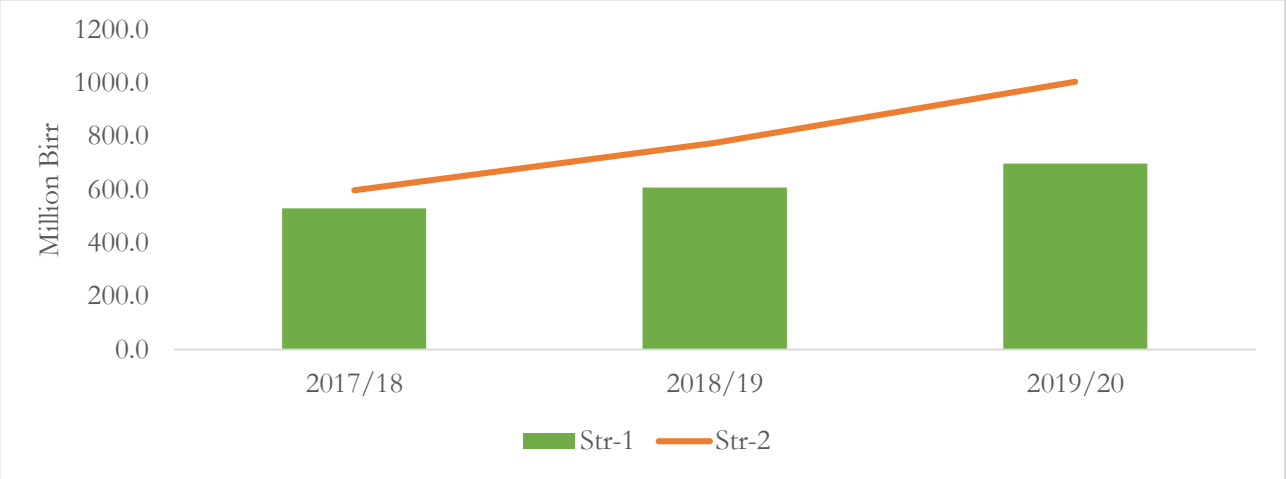
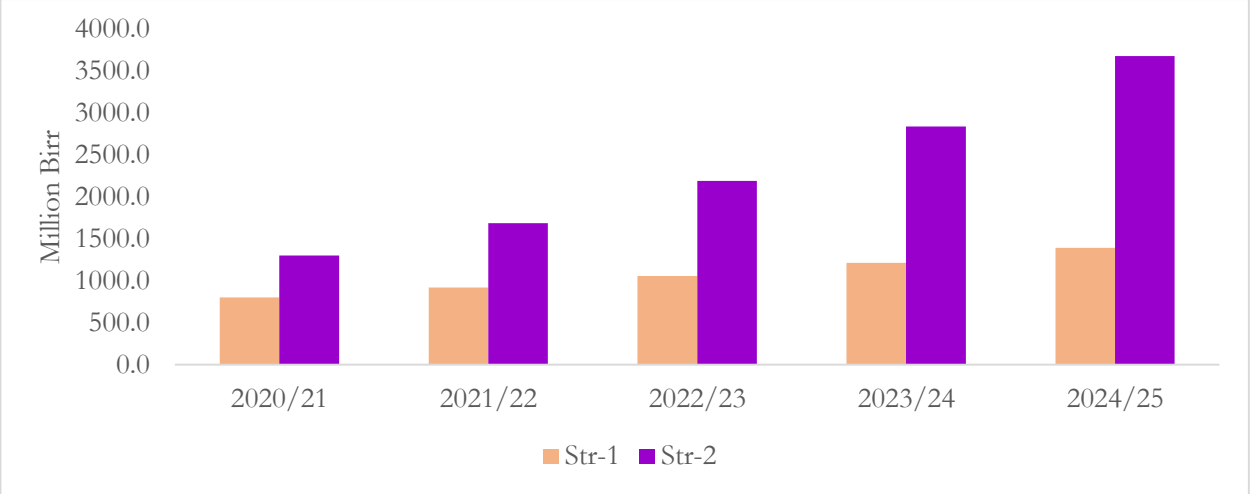


Figure *16*: Climate change related financing needs projection for the transport sector, 2025/26-2029/30



## 4.3. Climate Finance Analysis for the Urban Development and Housing Sector

### 4.3.1 Climate related initiatives in the urban sector

The Sustainable Development Goals recognise the centrality of future urban development to achieving sustainability goals, in setting out Goal 11 to make cities inclusive, safe, resilient and sustainable. Given the rapidity of urbanisation and the long-lived nature of urban infrastructure, the decisions made today by national and city decision makers, in partnership with private investors, will determine our economic future and climate security for the second half of the century.

Investing in sustainable urban infrastructure that supports compact, connected, resilient and sustainable growth in cities could yield high returns on multiple levels, including the following:

- Compact urban development could reduce global urban infrastructure requirements[16] and favour public transport over dependence on personal motorized transportation, which in turn, limits GHG emissions and improves local air quality, and
- Investment in public transport, building efficiency and better waste management could save cities.[17]

On the other hand, development through sprawl raises the costs of infrastructure and consumer goods, needlessly emits GHGs, and contributes to unsafe roads and poor health. CRGE interventions in the urban sector have three abatement levers, largely mitigation interventions: reduction of electricity demand through efficient lighting, improved landfill gas management (capture gas for flaring), and liquid waste emissions management (capture gas for flaring) (FDRE, 2011). On non-motorized transport system, the CRGE strategy clearly states the government's future intent involving changing roads from gravel to asphalt,

[16] Studies (e.g. New Climate Economy, 2016) indicate that investment in compact urban development could reduce global urban infrastructure requirements by more than US$3 trillion from 2015 to 2030.

[17] A study by the New Climate Economy (2016) indicates that investing in public transport, building efficiency and better waste management could save cities around US$17 trillion globally by 2050 (based on energy savings alone)

establishing dry ports, encouraging the use of telecommunication as well as promoting scooters and bicycles.

The Ethiopian Cities Resilient and Green Growth Package (ECR-3G2P) supports the implementation of the CRGE strategy and consists of ten pillars for inclusive and green urban transformation.

- Job creation, Micro and Small enterprise development;
- Capacity building and good governance;
- Urban planning and design;
- Land development & management
- Housing development & management;
- Construction industry Development;
- Integrated urban infrastructure development and service Delivery
- Green & safer cities;
- Strategic leadership development; and
- Policy implementation.

One of the pillar strategies of the government, as indicated in its medium-term development plan (GTP II, 2015/16-2019/2020), is to guide and manage the rapid urbanization to stimulate and drive economic growth, low carbon emissions and poverty reduction (NPC, 2016). The Climate Change Resilient Urban Green Development Strategy (CCRUGDS), which is developed by the Ministry of Urban Development and Housing, promotes inclusive and sustainable cities through the provision of urban green infrastructure services provisions (MoUDH, 2014). The Urban Greenery Development Strategy, linked to the GTP II, aims to achieve sustainable development goals by developing green areas. The strategy aims to reserve 30 percent of municipal land for the development of green areas, based on green development standards and designs. This entails in integrating liveability into cities through clean and decent streets, allocation of urban lands to build eco-friendly industrial parks, efficient and cost-effective urban planning and implementation system, sustainably planted areas, and open spaces contributes to the green cities components of the Climate Resilient Green Economy strategy. Key implementation strategies envisaged during GTP-II include the following.

- Urban Leadership Building program;

- Urban Development Safety Net Program;
- Urban Good Governance and Capacity Building Program;
- Urban Planning and Implementation Program;
- Urban Land Development and Management Reform Program;
- Housing Development and Management Program;
- Integrated Urban Infrastructure Delivery Program;
- Urban Green Infrastructure Development and Beautification Improvement Program;
- Urban map production, Surveying and Land use right registration Program; and
- Urban Finance Development and Management Program.

Two donor-funded urban-based interventions worth mentioning, namely Urban Local Government Development Programme (ULGDP) (I & II) and Urban Productive Safety Net Project (UPSNP).

**ULGDP**: This programme provides block grants to municipal local governments that are largely used by municipalities for developing infrastructure, in part through labour-intensive public work. Phase 1 of the program (ULGDP I, 2008-2012) focused on addressing the capacity and infrastructure deficits of 37 urban local governments (ULGs) in total. It consisted of three components: urban infrastructure investments, capacity building grants, and implementation support.[18] Based on phase I, ULGDP II ((2014-2019) focuses on roads, integrated multiple infrastructure and land services (residential, micro and small enterprises, industrial zones), Sanitation (liquid waste), Solid waste management, Urban drainage, Built facilities, Urban parks and greenery, consultancy services for design and contract management, and capacity building support.[19]

**Urban Productive Safety Net Project (UPSNP):** The National Social Protection Policy (NSPP), which was approved by Council of Ministers in 2014, has identified social safety nets and livelihood and employment generation as important pillars. Within the framework of the NSPP, the Ministry of Urban Development and Housing (MUDHo) has developed

[18] ULGDP I had a total budget envelope of US$416 million (US$300 million from IDA and US$116 million from the government).

[19] The total investment cost of ULGDP II is US$ 556.55 million, of which 68 percent is covered by the World Bank through its International Development Assistance window and the remaining is contributed by the Government of Ethiopia.

an Urban Food Security and Job Creation Strategy, which was approved by the government in May 2015. The strategy aims to reduce poverty and vulnerability among the urban poor. The Urban Productive Safety Net Project (UPSNP) is fully embedded in the NSPP and GTP II. In addition, other important national policies and strategies will also guide the design and implementation of UPSNP. Accordingly, the UPSNP is designed to support the implementation of the following government policies, strategies and plans:

- The GTP II (2015/16–2019/20);
- Ethiopian Cities Prosperity Initiative: Building Green, Resilient and Well Governed Cities;
- The Urban Development Policy (2005);
- The National Policy and Strategy on Disaster Risk Management;
- The Climate Resilient Green Economy Strategy;
- The National Nutrition Program; and
- The National Financial Inclusion Strategy.

It should be noted that the various urban-based interventions help address both adaptation and mitigation aspects of climate change. For instance, some interventions such as skill development and formation aim to build resilience (adaptation), while others (such as solid waste management) help reduce GHG (mitigation). There are also other interventions that aim to enhance the regulatory capacity of urban local government and establish systems (i.e. supporting areas). The project has three major components: Safety Net Support; Livelihood Services; and (c) Institutional Strengthening and Project Management.

### 4.3.2 Other specific initiatives

Ethiopia's Sustainable Cities Project to be submitted to the Green Climate Fund has four main components (Enabling environment, solid waste management, urban greening, and sustainable non-motorized transport), each component comprising subcomponents and related activities. The project will initially be implemented in 10 cities and could require an investment cost of around US$ 50 million for three years. The government of Ethiopia is moving towards an integrated solid waste management approach and is that is shown in the recent policies on waste reduction, recycling & energy recovery.

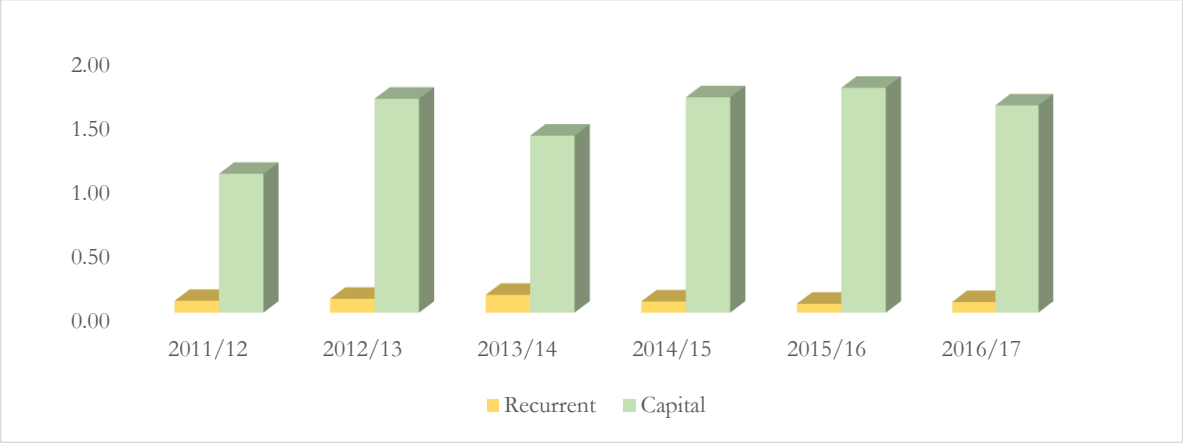
The "Urban Development Fund" (UDF) aims to support the operation and maintenance of infrastructure facilities including landfills, with financial support from the Government of the Federal Republic of Germany (KfW).[20] The overall goal of the program is to contribute to improved service delivery and infrastructure provision as part of "Urban Governance and Decentralisation Programme" in selected urban towns and cities. Activities included improvement in urban planning and public service provision as well as a pro-poor urban development. The World Bank has also provided support for Capacity Building for Decentralized Service Delivery Project (CBDSD) aimed to restructure and empower local governments.

### 4.3.3 Urban Sector Expenditure

The Urban Development and Housing sector fall under the economic development category of the government budget classifications. In the integrated budget expenditure (IBEX) system, it is possible to identify government expenditures specific to the urban sector. Accordingly, recurrent expenditure allocated to the urban sector has increased from ETB 47.3 million in 2011/12 to ETB 123.8 million in 2016/17, grew by about 21.8 percent per year. Similarly, capital budget allocated to the urban sector has also increased from ETB 788.5 million to ETB 2.4 billion over the same period; it grew by about 25.6 percent per year. The share of capital expenditure increased from 1.1 percent in 2011/12 to 1.6 percent in 2016/17 (Figure 17). Note that recurrent expenditures are wholly financed through domestic budget, while capital expenditure is financed from both treasury and external sources including grants and loans (Figure 18). The share of grants and loans accounted for a large share of capital expenditure, indicating that urban sector heavily depends on external sources of finance for its capital investment.

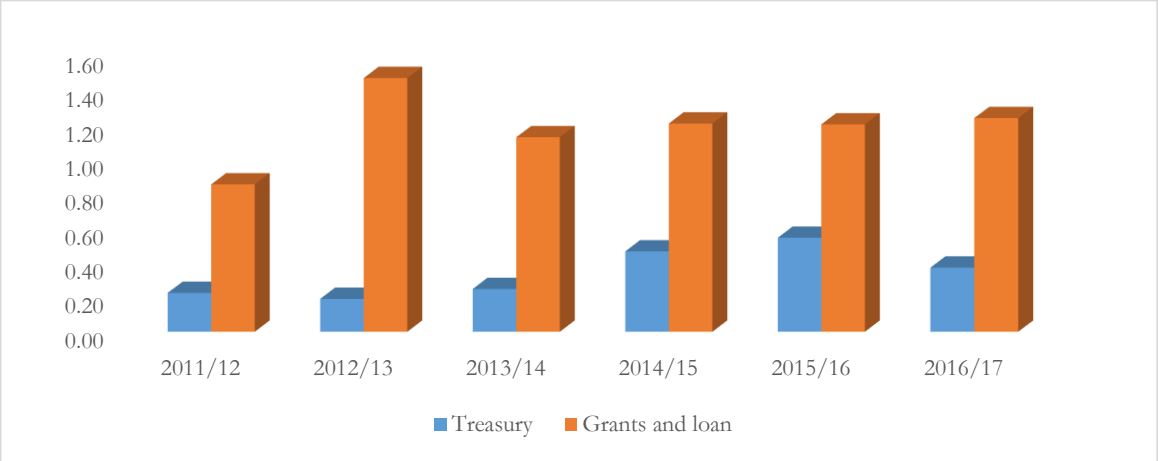
*Figure 17* Share of recurrent and capital expenditure on urban sector (percent of total recurrent and capital expenditure)

[20] See also MoFEC (2018), Feasibility Study Title of Program: Sustainable Cities Programme in Ethiopia.




Source: Based on MoFEC data

Figure *18* Share of treasury and external sources of finance in total capital expenditure (percent of total urban capital expenditure)




Source: Based on MoFEC data

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### *4.3.2 Analysis of climate change expenditure in the urban sector*

The CRGE strategy, Ethiopian Cities Prosperity Initiative: Building Green, Resilient and Well Governed Cities and Ethiopian Cities Resilient and Green Growth and Governance Programs Package (ECR-3G2P) and NAP provide guidance on climate change relevance of interventions in the urban sector. However, in Ethiopia the urban sector plays the role of mitigation in terms of reducing greenhouse gas emissions (GHG) as stipulated in the CRGE strategy and NAP.

The overall size of the government budget for the urban sector in nominal terms increased from ETB 835.8 million in 2011/12 to ETB 2546 million in 2016/17, indicating an average

annual growth rate of 20.4 percent. This growth in expenditures was significantly higher than the average annual inflation rate during the period. Comparison of climate change-relevant expenditure with GDP shows climate change-related expenditures in the urban sector as a share of GDP has marginally increased from 0.11 percent in 2011/12 to 0.14 percent in 2016/17 (Table 11). Despite substantial expansion in GDP and rapid urbanization, the share of urban sector expenditure in GDP remained low.

Table 11: Overview of the climate change budget for the urban sector

| | Climate change relevant expenditure (Million birr) | Inflation rate | Share in GDP (Percent) |
|---|---|---|---|
| 2011/12 | 835.8 | 34.1 | 0.11 |
| 2012/13 | 1,586.5 | 13.5 | 0.18 |
| 2013/14 | 1,587.0 | 8.1 | 0.15 |
| 2014/15 | 2,065.0 | 7.7 | 0.17 |
| 2015/16 | 2,616.6 | 9.7 | 0.17 |
| 2016/17 | 2,546.0 | 7.2 | 0.14 |

Source: National Bank of Ethiopia for inflation; MoFEC's database for budget; and National Planning Commission for GDP

### *4.3.3 Identifying, classifying and assessing climate relevance of the urban sector expenditures*

This section provides more detail on the manner in which expenditure line items have been selected and analysed for the urban sector. Government budget data from the integrated budget expenditure system is often presented in the form of short descriptions for line items. A "three steps" approach was followed in identifying the climate projects and determining the relevance of climate related expenditures (Table 12 and 13).

Table 12: Typology of themes in the urban sector

| **Theme** | **Relevant activities** | |
|---|---|---|
| Adaptation (A), or A/M | Urban greenery | |
| | Changes in the design of infrastructure | |
| Mitigation (M), or A/M | Solid waste and waste water collection management | Inland waterway transport |
| | Research and development | Railways |
| | Urban infrastructure | |
| | Policy and Public Administration | |
| Supporting areas (SA) | Capacity building and institutional strengthening | Finance and technology transfer (e.g. Climate financing and Technology transfers) |
| | Awareness raising and education | |

Table 13 : Climate change expenditure by relevance

| Relevance | Rational | Weight (%) | Examples |
|---|---|---|---|
| High | Clear primary objective of delivering specific outcomes that improve climate resilience or contribute to mitigation | ≥ 75 | • Updating and implementing codes and standards, policies and regulations |
| Medium | Either (i) secondary objectives related to building climate resilience or contributing to mitigation, or (ii) mixed programmes with a range of activities that are not easily separated but include at least some that promote climate resilience or mitigation | Between 50 and 74 | • Education and research in the sector |
| Low | Activities that display attributes where indirect adaptation and mitigation benefits may arise | Between 25 and 49 | • Urban infrastructure design with identifiable elements of climate proofing.<br>• Strengthening, improvement and rehabilitation of urban infrastructure. |
| Marginal | Activities that have only very indirect and theoretical links to climate resilience | Less than 25 | • Research initiatives that do not have an explicit climate change element<br>• Urban road investment with no particular climate proofing. |

### 4.3.4 Climate expenditures by theme and relevance[21]

Between 2011/12 and 2016/17, about 61.8 percent of climate budget in the urban sector was spent in activities that involved adaptation or mitigation (A/M) theme, indicating the increasing role of the urban sector in resilience building and mitigation purposes. The share of climate budget on mitigation increased from 0.39 percent of total climate related budget in 2011/12 to 0.57 percent in 2016/17 (Figure 15). Similarly, on average 35.3 percent of climate-related government expenditure on urban sector was mainly to supporting activities, while adaptation alone related expenditure was negligible. The increasing focus on

[21] This analysis does not include adaptation and mitigation related private investment in urban areas due to lack of information.

adaptation/mitigation is in line with Ethiopia's rapidly growing urbanization, especially which accounted for a significant share of GHG emissions from solid and liquid waste.

Figure 19: Climate related expenditure by theme (Percent of total climate related expenditure)

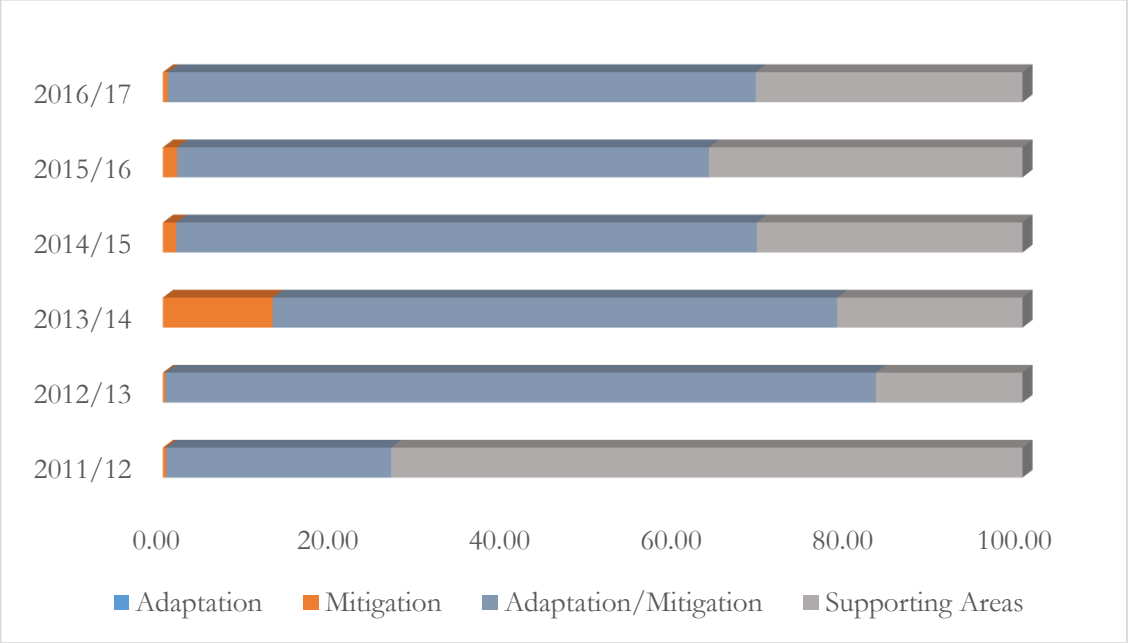
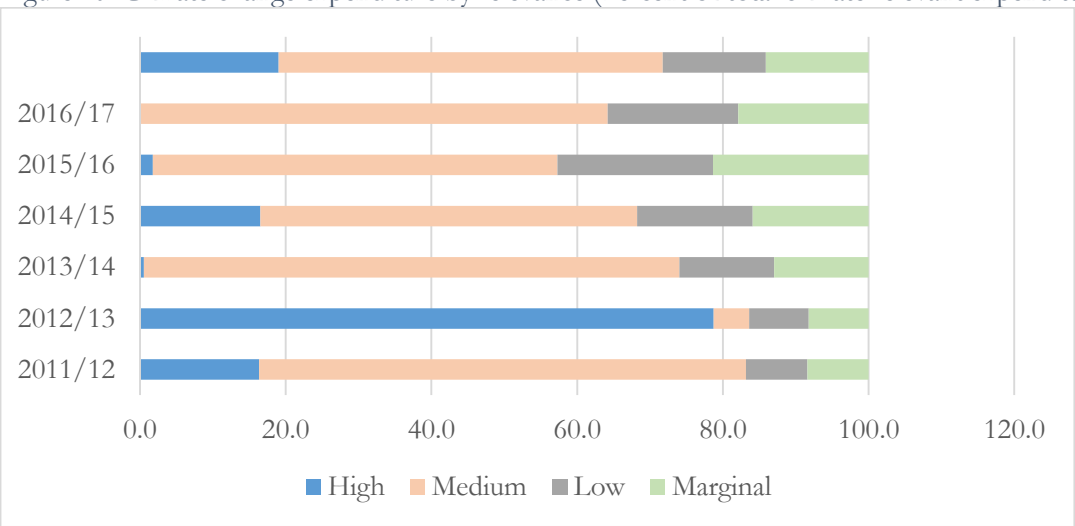



Figure 20 presents a summary of total climate change-relevant expenditure by relevance (high, medium low and marginal). Accordingly, expenditures concentrate on medium relevant climate change programes/projects and activities, which accounted for about 52.7 percent of total climate change expenditure between 2011/12 and 2016/17, followed by high relevant climate change expenditure (19 percent). Low and marginal relevant climate change expenditures each accounting for 14.1 percent of total expenditure.

Figure *20*: Climate change expenditure by relevance (Percent of total climate relevant expenditure)



### 4.3.5 Projecting climate change related expenditure for the urban sector

#### 4.3.5.1 Methodological note

The main entry points for forecasting climate related financing needs/expenditures in the urban sector are the CRGE strategy, Climate Change Resilient Urban Green Infrastructure Strategy, the Ethiopian Cities Prosperity Initiative: Building Green, Resilient and Well Governed Cities, Urban Development Policy, NAP and GTP-II. These documents provide not only current interventions but also climate related investments in the future. For instance, the Ethiopian Cities Prosperity Initiative and Ethiopian Cities Resilient and Green Growth and Governance Programs Package (ECR-3G2P) provide a framework for an integrated and green urban investment now and in the future. These frameworks provide the basis for projecting climate relevant activities and expenditures for the GTP-II period and beyond. A number of interventions are in place in urban areas. These include the following.

**Urban Local Government Development Program (ULGDP) (I & II),** supported by the World Bank, provides block grants to municipal local governments that are largely used by municipalities for developing infrastructure, in part through labour-intensive public work. It has a number of components for urban development. Urban Local Governments (ULGs) are encouraged to focus on projects that will contribute directly to creating jobs and increasing incomes, including those using labour-intensive techniques (e.g. cobble stones). Specifically, areas targeted under ULGDP II (2014-2019) include roads, integrated multiple infrastructure and land services (residential, micro and small enterprises, industrial zones), Sanitation (liquid waste), Solid waste management, Urban drainage, Built facilities, Urban parks and greenery, consultancy services for design and contract management, and capacity building support (see Annex, Table A1). The total investment cost of ULGDP II is US$ 556.55 million, of which 68 percent is covered by the World Bank through its International Development Assistance window and the remaining is contributed by the Government of Ethiopia. This projects covers 44 urban local governments (ULGs) aims to support urban infrastructure and services investments and capacity building (US$499.55 million). It also provides support to regional governments' capacity building and oversight/support to participating ULGs (US$30.00 million) and to the Ministry of Urban Development and

Housing (MoUDH) to administer and coordinate the program, and strengthen its capacity to support and guide the regions and ULGs (US$27.00 million).

**Urban Productive Safety Net Project (UPSNP) will support increasing wage and self-employment** through investing in the skills of beneficiary households through public work, and training, and helping households secure the financing required to invest in self-employment opportunities and job search. In addition, it will increase the resilience of vulnerable urban households through timely and predictable transfers and livelihoods interventions. It has three major components: Safety Nets, Livelihood Services, institutional Strengthening and Project Management. The estimated investment cost of the project is about US$ 450 million and financed by the government and World Bank (Table 14).

Table 14: UPSNP Cost and Financing

| Project Components | Project Cost | IDA Financing including taxes | % Financing |
|---|---|---|---|
| 1. Safety **Net Support** | 336,000,000 | 224,000,000 | 49.78% |
| **2. Livelihood Services** | 79,000,000 | 53,000,000 | 11.78% |
| **3. Institutional Strengthening and Project Management** | 35,000,000 | 23,000,000 | 5.11% |
| **Total Costs** | 450,000,000 | 300,000,000 | 66.7% |
| 4. Total Project Costs (including GoE operational expenditures financed through the regular budget) | 489,000,000 | | |
| **Total Financing Required** | 450,000,000 | | |

Source: Urban Productive Safety Net Project (UPSNP)

As indicated in the National Adaptation Programme (NAP), different adaptation interventions are envisaged to increase the resilience of urban systems. These adaptation options include provision of housing, improving housing conditions, enhancing urban greenery, and improving urban infrastructure, urban land planning and management, and urban administration and management programmes for efficient household/urban waste management system (FDRE, 2017).

These all indicate significant investment in urban areas in the future. Given that there is paucity of adequate information on costed plans, there is little means of estimating future expenditures that might be incurred. In these cases, projections of future climate change expenditures will be mainly based on past expenditure trends. Accordingly, two scenarios

will be used to estimate and project climate investment expenditures in the transport sector between 2017/18-2030/31.

**Scenario 1 ($S_{ur}$-1)**[22]: The first scenario considers climate investment financing needs based on historical trends. This scenarios projects climate change relevant expenditures based on historical average growth rate of the transport sector which is 12.6 percent per year.

**Scenario 2 ($S_{ur}$-2)**: The second scenario considers a more optimistic situation, taking into account current and future investment initiatives and assumes that government and development partners' investment in the urban sector is expected to increase between 2017/18 and 2030/31. This seems a more realistic assumption given that there are ongoing and planned initiatives to make the urban system resilient and green. This scenario assumes a growth rate of the most recent years (between 2014/15 and 2016/17), which is 28.4 percent per year.

#### 4.3.5.2 Analysis of expenditure projection

Similar to the transport sector, forecasting climate change financing needs for the urban sector is made for three phases corresponding to government's medium-term development plans. Given that information on actual financing needs/expenditures related to climate change are available before 2017/18, forecasting is made starting from 2017/18 onwards. In the first scenario ($S_{ur}$-1), climate change related financing needs in the urban sector would increase from ETB 2.9 billion in 2017/18 to ETB 3.6 billion in 2019/20 (Figure 21). In this scenario, climate change related financing needs/expenditures in the urban sector would be ETB 3.6 billion in 2019/20 (end of GTP-II period) (Figure 21). In the optimistic scenario ($S_{ur}$-2), climate change related financing needs/expenditures in the urban sector would increase from ETB 4.1 billion to ETB 6.6 billion in 2024/25 (end of GTP-II) (Figure 22). By the end of GTP-III, climate change related financing needs would be 65.7 billion. This huge climate change related financing requirement is consistent with the growing urbanization and government's intention to greening the urban sector across the country. This means that Ethiopian needs to mobilize resources to finance this growing climate

[22] 'CE' refers to scenario for *climate relevant expenditure*.

change related expenditures in the years to come. Financial resources can be mobilized from both domestic and external sources.

*Figure 21: Climate change related financing needs projection for the urban sector, 2017/18-2019/20*

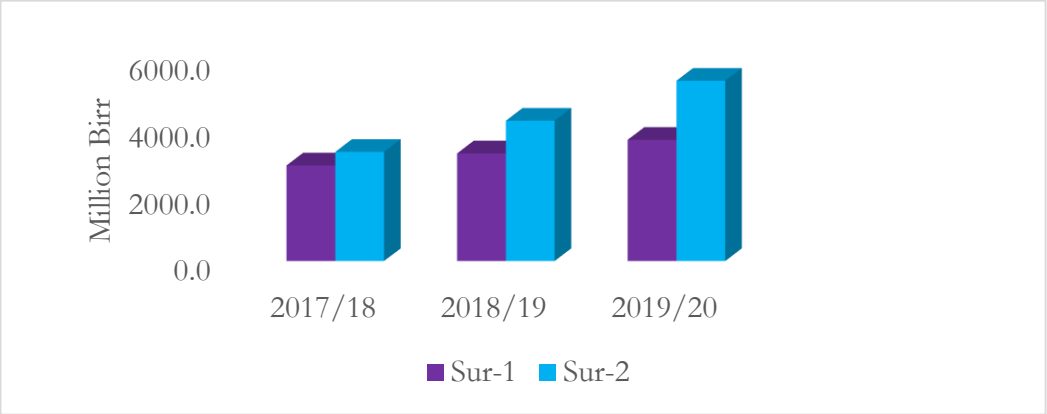



*Figure 22: Climate change related financing needs projection for the urban sector, 2020/21-2024/25*

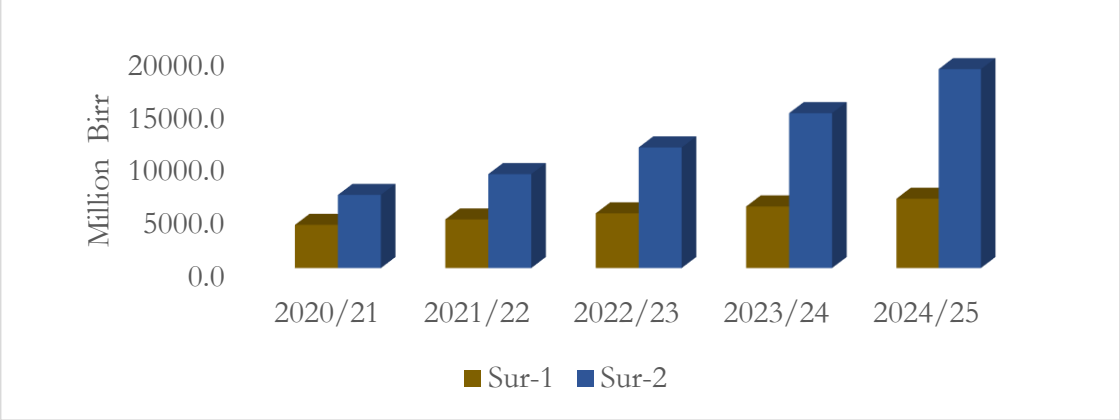
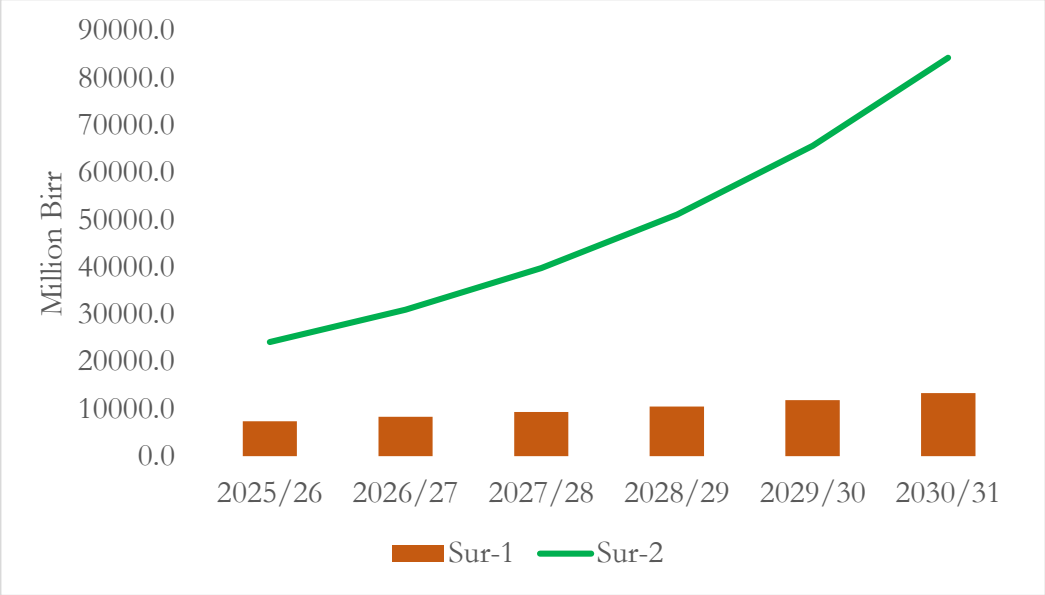


*Figure 23: Climate change related financing needs projection for the urban sector, 20225/26-2030/31*



# 5. Conclusions

## 5.1 Key insights

The climate finance tracking and projection exercise in the forest, transport and urban sectors have created better understanding on how the federal government of Ethiopia invests public financial resources on climate relevant interventions in these sectors. The exercise also highlighted sectoral climate financing trend since the announcement of the CRGE Strategy in 2011 and the climate finance projection exercise will have greater contribution in designing appropriate climate financing and resource mobilization strategy.

**Forest Sector-** Both recurrent and capital budget allocations to the forestry sector remained small. In particular, government capital budget allocation to the forestry sector as a share of total recurrent expenditure was 0.02 percent between 2011/2 and 2015/16. The figure for capital expenditure was 0.29 percent of total capital expenditure over the same period. Given the scale of deforestation and associated environmental degradation, the expenditure allocated to the sector is worrisome in the era of growing risk of climate change. While recurrent activities for the forestry sector are financed through domestic financial sources, capital activities are financed mainly through both government treasury and external finance. Government treasury has become an important source of capital finance in recent years. Between 2011/12 and 2015/16, government treasury as share of total capital expenditure was 0.05 percent of total capital expenditure, while capital expenditure financed from external sources was 0.24 percent. Both grants and loans as a share of total expenditure marginally increased from 0.10 percent in 2011/12 to 0.21 percent in 2015/16. Although government allocates budget for financing capital expenditure, a large share of it has been financed through external sources, indicating heavy reliance on external sources. Recurrent activities are financed solely from government treasury. Second, capital investments are financed from a mix of finance sources including government treasury, grants and loans. In particular, there seems to be a change in the mode of financing as the share of government treasury in total finance (both recurrent and capital) has shown an increasing trend over time. Classification of forest expenditure indicates that spending on both adaptation and mitigation accounted for a large of share of total climate change related expenditure between 2011/12 and 2016/17. The increasing focus on both adaptation and mitigation is in coherent with Ethiopia's low level of development and high levels of deforestation. Climate change

related expenditure projection for the forestry sector indicates the scale of finance required for financing the growing expenditure in the future. Under a conservative scenario, climate change related expenditure would double by the end of GTP-II period. The optimistic scenario indicates a significant climate change related expenditure during GTP-II period and beyond.

**Transport Sector-** Government capital budget allocation to the transport sector as a share of total recurrent expenditure was 0.22 percent between 2011/2 and 2016/17. The capital expenditure was even smaller at 0.09 percent of total capital expenditure over the same period. Given the rapidly growing sector, the expenditure allocated to the sector is worrisome. Government treasury has remained an important source of both capital and recurrent finance for the transport sector. The sector has received limited support from external finance, with grants and loans as a share of total expenditure remained insignificant. Classification of expenditure indicates that spending on mitigation interventions accounted for a large of share of total climate change related expenditure between 2011/12 and 2016/17. The increasing focus on mitigation is in coherent with Ethiopia's CRGE strategy as well as its CRTSS. Climate change related expenditure projection for the transport sector indicates the scale of finance required for financing the growing expenditure in the future. Under a conservative scenario, climate change related expenditure would increase significantly by the end of GTP-II period. The optimistic scenario indicates even a significant climate change related expenditure during GTP-II period and beyond, indicating massive investment in mitigation elements of the transport sector.

**Urban Development and Housing Sector-** Government recurrent budget allocation to the urban sector as a share of total recurrent expenditure was 0.10 percent between 2011/2 and 2016/17. The average figure for capital expenditure was even smaller at 1.53 percent of total capital expenditure over the same period. Given the rapidly growing sector, the expenditure allocated to the sector is inadequate. Government treasury has contributed to a small proportion of capital expenditure for the urban sector, accounting for on average 0.34 percent of total capital expenditure. Grants and loans accounted for 1.19 percent of total capital expenditure. Note that both recurrent and capital budget has shown an increasing trend in recent years. Classification of expenditure indicates that spending on adaptation and mitigation accounted for a large of share of total climate change related expenditure between

2011/12 and 2016/17. The increasing focus on adaptation and mitigation is in coherent with Ethiopia's CRGE strategy as well as its urban development policy in building a resilient urban system. Climate change relevant expenditure are concentrated in the medium relevant category of relevance. This means that climate change interventions are of secondary objectives related to building climate resilience or contributing to mitigation, or mixed programs with a range of activities that are not easily separated but include at least some that promote climate resilience or mitigation of the urban system. Climate change related expenditure projection for the urban sector indicates the scale of finance required for financing the growing expenditure in the future. Under a conservative scenario, climate change related expenditure would increase significantly by the end of GTP-II period. The optimistic scenario indicates even a more significant climate change related expenditure during GTP-II period and beyond, indicating massive investments required in adaptation and mitigation elements of the urban sector.

### 5.2 Challenges and gaps

A number of challenges need to be highlighted. First, there is no organized database in the relevant sectors to record and monitor climate change related investments, indicating the need for establishing reliable and timely information to support the effort of tracking climate change related activities and financing needs. This can be addressed through designing a capacity building programme for CRGE directorates of relevant sector ministries, focusing on database management and climate finance. Second, there is a need to track climate related investments and finance by the private sector and civil society organizations and this requires a separate assessment. Third, more work is required to capture the allocation of climate finance by regional governments. Finally, frequent institutional change in the form of merging and separating institutions adversely affects continuity of climate change programmes and projects as responsibility and ownership changes. This also leads to loss of essential data and information on specific programmes and projects.

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# 7. Annexes

## 7.1 Forest Sector

Climate change related programs and projects for the forestry sector

**Climate related projects in the forestry sector: National**

| Program | 2011/12 | 2012/13 | 2013/14 |
|---|---|---|---|
| | **Core projects (capital investment)** | | |
| **Natural Resource Development, Conservation and Utilization** | Eastern Africa Bamboo Development Project | Sustainable Land use Management Project | Drought Resilience and Sustainable Livelihood Project |
| | Tree Seeds Cleaning and Storage Construction | Participatory Forest Management Project | Sustainable Land Use Management Project |
| | Sustainable Land Management Project | Eastern Africa Bamboo Development Project | Participatory Forest Management Project |
| | Participatory Forest Management | Tree Seeds Cleaning & Storage Construction Project | Tree Seeds Cleaning & Storage Construction Project |
| | Climate Change Project | Climate Change Project | Climate Change Project |
| **Forestry research** | Plantation and Agroforestry Research | Managing Environmental Resources to Enable Transition to More Sustainable Livelihoods/MERET<br>Plantation and Agroforestry Research | Managing Environmental Resources to Enable Transition to More Sustainable Livelihoods/MERET<br>Community Based Integrated natural Resource |
| | Wood Products Utilization Research | Wood Products Utilization Research | Plantation and Agroforestry Research |
| | Non Timber Forest Products Utilization Research | Non Timber Forest Products Utilization Research | Wood Products Utilization Research |
| | Natural Forest Research | Natural Forest Research | Non Timber Forest Products Utilization Research |
| **Green Economy Implementation Capacity Building** | Africa Adaptation Program | African Climate change Adaptation Program | Natural Forest Research |
| | | Global climate change Alliance Ethiopia | African Climate Change Adaptation Program |

| | | | |
|---|---|---|---|
| **Green Economy Development Effectiveness Monitoring &Control** | Climate Change & Environmental Sustainability | Promoting Autonomous Adaptation at the community Level in Ethiopia<br>Climate Resilient Green Economy Program<br>International treaty for the Ethiopian Climate change performance | Promoting Autonomous Adaptation at the Community Level in Ethiopia<br>Climate Resilient green economy.-CRGE |
| **State of Environment for Green Economy Development** | Global Climate Change Alliance -Ethiopia | | |
| | **Other programs (Recurrent expenditure)** | | |
| **Natural Resource Development, Conservation and Utilization** | Natural Resource Development, Conservation and Utilization Directorate | Natural Resource Development, Conservation & Utilization Directorate | |
| **Management and Administration** | Support and Services | Support and Services | |
| **Policy and Law Formulation for Green Economy** | Environmental System Design Directorate | Environmental System Design Directorate | |
| **Green Economy Implementation Capacity Building** | Technology Transfer Directorate | Technology Transfer Directorate | |
| **Green Economy Development Effectiveness Monitoring &Control** | Monitoring and Control Directorate | State of Environment Assessment Directorate | |
| **State of Environment for Green Economy Development** | State of Environment Assessment and Reporting Directorate | | |

| Programs | 2014/15 | 2015/16 |
|---|---|---|
| | **Core projects (capital investment)** | |
| **Natural Resource Development, Conservation and Utilization** | Sustainable Land Use Management Project | Sustainable Land Use Management Project |
| | Tree Seeds Cleaning & Storage Construction Project | Tree Seeds Cleaning & Storage Construction Project |
| | Managing Environmental Resources to Enable Transition to More Sustainable Livelihoods/MERET | Managing Environmental Resources to Enable Transition to More Sustainable Livelihoods/MERET |
| | Community Based Integrated natural Resources | |
| **Forestry Research** | | Plantation forest research |
| | | Agroforestry research |
| | | Non timber forest product research |
| | | Forest pathology and entomology research |
| **Forest Development and Conservation Program** | African Climate Change Adaptation Program | Reducing Emissions from Deforestation |
| | Reducing Emissions from Deforestation | Forest Technology |
| | | Wood Product Utilization |
| **Forest Resource and Environment Protection Program** | Forest Technology | |
| | Wood Product Utilization | |
| **Environment Development, Protection and Conservation Program** | International treaty for the Ethiopian Climate change performance | |
| | **Other programs (Recurrent expenditure)** | |
| **Natural Resource Development, Conservation and Utilization** | Natural Resource Development, Conservation & Utilization Directorate | Natural Resource Development, Conservation & Utilization Directorate |
| **Management and Administration** | Support and Services | Support and Services |
| **Environment Development, Protection and Conservation Program** | Environment Development, Protection and Conservation Directorate | Environment Development, Protection and Conservation Directorate |
| **Forest Development and Conservation Program** | Forest Development and Conservation Directorate | Forest Development and Conservation Directorate |
| **Forest Management and Administration** | Forest Support and Services | Forest Support and Services |

## Forest related programs and projects by region

| Program/project | Objective | Main activities | Region | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Amhara | Benishangul-Gumuz | Gambella | Oromia | SNNPR | Tigray |
| Sustainable Land Management Program | To reduce land degradation and improve land productivity in selected watersheds in targeted regions in Ethiopia. | • PFM in three critical watersheds/woredas<br>• Degraded landscape restoration and revegetation<br>• Community-Based participatory watershed development<br>• Grazing land closures plus ANR<br>• Soil and water conservation, small scale irrigation and intensification<br>• Climate smart agriculture (CSA)<br>• Small holder land certification and tenure security<br>• Afforestation/reforestation (A/R) | US$ 25M | US$ 7M | US$ 4.5M | US$40M | US$ 24M | US$ 10M |
| Productive Safety Nets Project-4 (PSNP-4) | To increase access to safety net and disaster risk management systems, complementary livelihoods services and nutrition support for food insecure households in rural Ethiopia. | • Asset building and livelihoods support (crop, livestock and off-farm activities)<br>• Employment opportunities in civil works (roads, catchment rehabilitation, water abstraction, etc.)<br>• Training to farmers in Farmer Training Centers (FTCs) and pastoralists in crop and livestock management and off-farm diversification<br>• Community-Based Participatory Watershed Development<br>• Rural savings and credit cooperatives<br>• Afforestation/reforestation | US$10M | US$2M | US$2M | US$60M | US$15M | US$4M |
| Agricultural Growth Project 2 (AGP-2) | To increase agricultural productivity and commercialization of smallholder farmers targeted by the project. | • Demand driven agricultural extension and technology promotion<br>• Training to woreda experts, DAs and farmers on participatory extension management, improved crop and livestock technologies, postharvest handling and market-oriented agricultural commodities<br>• Vegetables and fruit crop development<br>• Agricultural marketing and value chain (agri-business development)<br>• Local level land use planning | US$65M | US$3.2M | US$3.2 M | US$100M | US$56M | US$20M |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | • Community based participatory watershed management, soil fertility enhancement and small scale irrigation<br>• Climate-smart agriculture<br>• Agro-forestry<br>• Restoration of degraded agricultural land with tree-based strategies and area closures | | | | | | |
| Integrated Watershed Management (IWSM) (mass mobilization) | To improve livelihoods of rural communities and enhance food security and their capacity of enduring climate shocks through the rehabilitation of degraded lands, improved agricultural practices, and proper utilization of water resources | • Watershed planning<br>• Degraded landscape restoration<br>• Grazing land closures plus ANR<br>• Soil and water conservation, water abstraction and small scale irrigation<br>• (A/R)<br>• Community training in watershed planning, soil and water conservation and small scale irrigation use | * | US$ 0.2M | * | US$4.6M | | |
| Biodiversity Resources Conservation in National Protected Areas | | • Biodiversity conservation Including forest<br>• PFM<br>• Promoting eco-tourism and community livelihood support<br>• Local employment | * | | | | | |
| Forest Resources Development, Conservation and Sustainable Utilization of Amhara Forest Enterprise (AFE) | | Natural forest protection through PFM, developing plantation forests, management of forest resources (natural and planted forest), sustainable exploitation of timber and non-timber forest product (timber largely from plantation forest, gum- resin, honey and spices), value addition to NTFP and marketing of NTFP in high value markets, etc. | * | | | | | |
| Sustainable Development of Protected Area System in Ethiopia (SDPASE) | | • Biodiversity conservation Including forest<br>• PFM<br>• Promoting eco-tourism and community livelihood support<br>• Local employment | US$ 3M | | US$ 1M | US$12M | US$ 8M | US$ 1M |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| National REDD Readiness Project | | Establish REDD+ Management arrangement (REDD Steering Committee, REDD Technical Working Group and REDD regional institutions); Conduct REDD consultation and participation and stakeholders engagement; Develop National REDD Strategy; conduct strategic environmental and social assessment; Develop forest reference level and monitoring, reporting and verification mechanism, and pilot test REDD+ systems on the ground. | US$ 1M (for pilot project) | US$ 0.3m | US$ 13.6M | US$1M | US$ 1m | US$ 1m |
| Amhara Greening, Biodiversity and forest conservation Program of ORDA (Organization for Rehabilitation and Development in Amhara) | Increase forest cover in the region; increase economic contribution of forest at regional and local levels; and enhance biodiversity conservation in the low and highland areas of the region | Soil and water conservation; watershed management; afforestation and reforestation; PFM community establishment and PFM implementation; improving marketing of non-timber forest products; community training and capacity building; agro forestry; and community livelihood support | US$ 4.4M | NA | | | | |
| Tana & Beles Integrated Water Resources Development | Create an enabling environment for improved management of land and water resources of the Tana and Beles sub-basins with initial focus on institutional capacity building and demonstrative investments on watershed and flood management; and creating enabling environment for private sector participation | • Multisector investment planning and coordinated implementation arrangement<br>• Watershed Management<br>• A/R through community woodlot establishment<br>• increase income through small scale irrigation and improved crop land management<br>• Promoting private sector involvement<br>• NRM institution strengthening/establishment<br>• Renewable energy | US$ 40M | US$ 10M | NA | NA | NA | NA |
| Action Against Desertification in Support of the Implementation of the Great Green Wall for | To ensure sustainable management of natural resources in arid and semi-arid landscapes of three regional states and | Promote good governance and management of natural resources; enhance local community intervention along the GGW; strengthen food security through improved agro-silvo-pastoral | US$ 0.55M | * | * | * | * | US$ 0.5M |

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|---|---|---|---|---|---|---|---|---|
| the Sahara and the Sahel Initiative | improve the livelihood of the local community | production; and promote research and knowledge management. | | | | | | |
| Community Based Integrated Natural Resource Management Project (CBINReMP) | Promote integrated watershed development planning and sustainable land management; improve livelihoods for about 312,000 poor rural households in Lake Tana watersheds; combat land degradation in Lake Tana Sub Basin through up scaling of sustainable land management practices | Integrated Watershed management; rehabilitation of communal land (area closures); institutional capacity building; participatory forest management; off- farm soil and water conservation; land surveying, mapping, registration and certification; community forest development in degraded lands | US$24M | NA | NA | NA | NA | NA |
| REDD+ Participatory Forest Management in South-West Ethiopia (REPAFMA II-SW Ethiopia)- Phase two | To increase carbon storage in forests of Gambella Regional State by promoting participatory forest management (PFM) and livelihood support actions | Natural forest conservation and reducing deforestation and degradation through PFM, marketing of non-timber forest products, and joint community -GoE management and use of forest resources. The Project covers 2 woreda in Gambella | NA | NA | US$ 0.5M | US$1M | US$ 1M | |
| Forest Resources Development, Conservation and Sustainable Utilization of Gambella BoA | Develop and protect forest resources in Gambella, and ensure sustainable utilization of forest resources by the state, community and private sector. | Natural forest protection through PFM, developing plantation forests, management of forest resources (natural and planted forest), sustainable exploitation of timber and non-timber forest product (timber largely from plantation forest, coffee, honey and spices), value addition to NTFP and marketing of forest coffee in high value markets, etc. | * | * | * | US$60 | * | |
| Community Based Conservation, Management and Development of Wild | Conservation and restoration of the Afromontane cloud forests and wetlands at | Reforestation, integrated watershed management, PFM, integrated monitoring of biodiversity resources and carbon stock, support women in biodiversity conservation and ecotourism, | NA | NA | NA | NA | US$ 2M | NA |

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|---|---|---|---|---|---|---|---|---|
| Coffee Forest inside *Kaffa Biosphere Reserves* | the Kaffa Biosphere Reserve (KBR), carbon dioxide emissions reduction, enhance ecosystem services for the local population, and serve as a model project for community based conservation and management practices | introduction of fuel saving stoves and alternative energy sources, agrobiodiversity, and employing forest rangers as extension for communication. The project works in 10woredas in area spanning 760,000ha of forest inside KBS. | | | | | | |
| Strengthen the Management System of the *Sheka Forest Biosphere Reserve* (SFBR) | Ensure long term environmental governance through a 10-years management plan for the Sheka Forest Biosphere Reserve through integrated management structure and procedures allowing increased participation in decision making. | Demarcating and mapping of the three zones (core, buffer and transition) of SFBR, preparing and endorsing long-term management plan for SFBR, PFM, biocultural conservation, establishing SFBR institutional set up and capacity building, developing information and forest resources monitoring system, community and local level GoE officials training, and livelihoods support. The Project operates in 3 Woredas in areas 238,750ha (total area of SFBR) | NA | NA | NA | NA | US$ 0.12M | NA |
| Humbo Community Managed Natural Regeneration Project | To sustainably manage existing native forest using "Farmer Managed Natural Regeneration" (FMNR) techniques, and establishment of additional areas of plantation forest; and to alleviate poverty through flow of direct (carbon finance) and indirect benefits from the managed forest for improvement of community health, education and food security. | Afforestation/reforestation activities; assisted regeneration and enrichment planting; forest management practices; forest resource monitoring and carbon estimation; community training and local capacity building; establishing user cooperatives and institutional formation; and livelihoods support activities. The project operates in 1 woreda (Humbo) in SNNPRS covering close to 2700 ha of degraded forest land within 7 cooperatives land holdings. | NA | NA | NA | NA | US$ 0.73M | NA |
| The Sodo Community Managed Reforestation | To maintaining and increasing native flora | Nursery establishment, Land preparation, planting and maintenance; restoration of native species using | NA | NA | NA | | * | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| (Forest Regeneration) Project | and fauna diversity, improving soil conditions to reduce the risk of floods, erosion and to improve agricultural yields and potential livelihood, environmental rehabilitation for carbon sequestration and to support long term sustainable ecosystem regeneration of the 503 hectares of the Mt Damota project area | farmer managed natural regeneration (FMNR) techniques; sustainable forest management; establishment of cooperatives for community development activities; livelihoods supporting activities and training and capacity building. The Project operates in 2 woredas (Sodo Zuria and Damot Gale Woredas) in SNNPRS within 5 rural cooperatives (Kebeles) holdings. Total Project area is 503 ha | | | | | | |
| A New Approach to the Conservation of Wild Coffea Arabica in South-west Ethiopia: Developing the Potential of Participatory | 'To contribute to *insitu* conservation of coffee biodiversity through application of simplified PFM procedures and joint (community and government) management and benefit sharing mechanisms. | Establishment of community based organizations for PFM, NTFP production and marketing; modifying and fine tuning of PFM procedures in line with biodiversity conservation principles; strengthening community livelihoods through NTFP marketing, payment for environmental services and ecotourism; training and capacity building of government bodies and communities in biodiversity conservation through PFM and livelihoods actions; Promoting sustainable land management; awareness raising and conducting research studies in biodiversity assessment, delineation and mapping, and NTFP resources. The Project covers 4 Woredas and 25 Kebeles in SNNPRS | NA | NA | NA | NA | US$ 2M | NA |
| Participatory Forest Management (PFM) in or Adjacent to Areas of the Sustainable Land Management Program(SLMP) in Ethiopia | To pilot the implementation of Participatory Forest Management (PFM) in and adjacent to critical watersheds under the national Sustainable Land Management Program (SLMP). | Area mapping; introduction of participatory inventory methods for biomass inventory and species distribution; advise on organizational structure and administration of CBOs; advise on structure and function of benefit sharing systems; capacity development for GoE's personnel on sustainable forest management; Capacity development for communities in sustainable forest management and advise on participatory forest utilization with focus on NTFP production and | NA | NA | NA | US$0.57M | NA | US$ 1.3M |

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|---|---|---|---|---|---|---|---|---|
| | | marketing. The Project covers 4 woreda and 12 kebeles in Tigray | | | | | | |
| Bale Mountains Eco-regional<br><br>REDD+ Project | To prevent high rate of deforestation and achieve a net anthropogenic GHG ER, which is estimated (*ex ante*) at 44,687,543 $tCO_2e$ (*not yet independently verified*) | REDD+ through PFM; agricultural intensification; development of alternative sources of fuelwood and construction poles through agroforestry and woodlot development; improving energy efficiency through introduction, distribution, and popularization of improved stoves; strengthening enforcement of existing policies and law; and strengthening the young and weak local institutions and structures for managing forest lands. In Oromia, 16 woredas and 62 Kebeles are under the Bale Mountains Eco-regional REDD+ Project. | NA | NA | NA | US$2.5 | NA | NA |
| Certified Forest Coffee Production and Promotion Project | To promote sustainable rural development and increasing farmers' income through forest conservation, expansion, and forest coffee certification in the Belete Gera Forest Area | Improve forest management and enhance sustainability in the target areas of Belete Gera, expand forest coffee certification, and provide capacity-building support to the OFWE and its Jimma Branch toward PFM and forest coffee certification operation. The project covers 2 woredas and 24 kebeles in Oromia. | NA | NA | NA | US$4 | NA | NA |
| Yayu Coffee Forest Biosphere Reserve Project | To contribute to sustainable development through strengthening institutional capacities to implement Yayu Coffee Forest Biosphere Reserve management plans and support efforts to improve livelihoods of the local community | Support to development and implementation of coffee forest management plan, conducting research, institutional development and strengthening of coffee forest cooperatives, capacity development to local GoE officials and communities, training and awareness raising on biodiversity in general, and conservation of coffee genetic resources in particular. The project works in 6 woredas and 30 kebeles. | NA | NA | NA | US$0.76 | NA | NA |
| Conservation of Biodiversity and Ecosystems Functions and Improved Well-being of Highland and Lowland Communities within the Bale Mountains Eco- | To conserve biodiversity in Bale Mountains Eco-Region and increase resilience and well-being of highland/lowland communities | Capacity building of communities and government institutions through training, exchange visit, material support, and mentoring; strengthening existing PFM; piloting participatory land-use planning and IWSM, introducing CSA; integration of community into ecotourism industry; introducing sustainable energy initiatives and creation of market linkage and business | NA | NA | NA | US$5.7M | NA | NA |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| regional REDD+ Project | | management. The project covers seven woredas in Oromia (Bale). | | | | | | |
| | | | | | | | | |

Notes: Green colored cells indicate program

## 7.2 Transport Sector

**A1:** Examples of adaptation for the transport sector

| | Non-qualifying elements | Qualifying costs |
|---|---|---|
| **Railways Transport** | | |
| The development of flood-related contingency plans for road or rail traffic management | Normal traffic planning activities<br>Contingency planning for non-climate related scenarios<br>Measures to improve traffic flows | Cost of flood-related contingency planning |
| Improvement in frequency of drain and culvert maintenance | Normal maintenance measures<br>Reinstatement of normal maintenance measures after a period of neglect | Cost of maintenance measures that provide necessary climate resilience (normal plus additional) |
| Change in culvert and roadside drainage system design specification | Roadside and rail drainage systems that have not been designed to cope with an increase in intensity or period of rainfall | Entire cost of climate resilient works |
| Fortification of existing bridge supports | Bridge rehabilitation projects that do not involve the use of additional fortification for roads and railways | Cost of bridges that are strengthened to specifications that go beyond standard practice |
| Modification of proposed bridge design (e.g. use designs that can withstand greater flows, longer spans to bridge unstable river banks) | Standard bridge designs that have not been modified to take account of future river flows | Cost of bridges that are strengthened to specifications that go beyond standard practice |
| Fortification of existing valley or coastal roads or railways (e.g. use of gabions, concrete walls) | Cost of bridges that are strengthened to specifications that go beyond standard practice | Cost of sections of road/ railway that are strengthened to specifications that go beyond standard practice |
| Changes to road and railway design to increase stability and resilience to erosion (e.g. changing composition of base materials, reduction in cut and fill slope angles, use of stabilization materials) | Designs that have not been modified to take account of future rainfall conditions or river flows | Cost of sections of road/ railway that are strengthened to specifications that go beyond standard practice |
| Realignment of roads/ railways to avoid areas that could become prone to flood, erosion or landslip in the future. | Sections of roads/ railway where the alignment decision is not influenced by climate change considerations | Cost of sections of road that have been realigned |
| **Urban Transport** | | |
| Change in choice of pavement to maximise infiltration/ reduce runoff | Gravel/ unpaved roads | Entire cost of road sections bearing high porosity pavement |
| **General Transportation** | | |
| Transport planning and associated construction to avoid areas that could become prone to flood, erosion or landslip in the future | National or local transport planning that does not consider climate change issues in detail | Cost of development of a climate resilient national or local transport plan, or similar. |
| Transport planning and associated construction to avoid areas (e.g. forests) whose climate resilience could be harmed directly or indirectly by the proximity of new transport links; or to avoid adverse effects of new transport links on these areas. | Alteration of routes in response to ESIA findings, except where the ESIA specifically highlights the fact that the area or community is vulnerable to climate change AND that the transport plan will exacerbate this vulnerability. | Cost of development of a climate resilient national or local transport plan, or similar and/or<br>Cost of construction of affected routes. |

| | | |
|---|---|---|
| Transport planning and associated construction activities that are part of emergency planning for climate related disasters | General emergency planning (unless covered by other sectors).<br>Transport planning and construction that is not carried out in response to climate change related emergencies. | Cost of development of the transport component of an emergency plan, or similar.<br>Cost of construction of affected routes. |
| Research into engineering design and materials to improve performance under future climate | Research not related to transport.<br>Research that does not address a problem related to climate. | Cost of the relevant components of the research project or programme. |

Source: AfDB (2013), pp. 16-20

**A2**: Examples of qualifying and non-qualifying mitigation elements

| Element | Non-qualifying element | Qualifying costs |
|---|---|---|
| **Air Transport/ Airports** | | |
| Reduce airport congestion before take-off and landing | Measures that reduce congestion but do not also reduce fuel consumption | Cost of designing measures, developing systems, roll out |
| Improvements in aviation facilities that reduce GHG emissions | Improvements that lead to a significant increase in short or medium-term GHG emissions during construction, for example due to increase in taxing distance or reduction in efficiency of customer transport modes | Cost of designing facilities, construction |
| Introduction of lower carbon aviation technologies | As above.<br>Technologies that are better than existing, but that perform worse than standard practice benchmarks | Cost of new aviation technologies. |
| Shift from high carbon to lower-carbon transport modes | As above. | Cost of lower-carbon transport modes. |
| Reduction of carbon-content in aviation infrastructure facilities | Use of biofuels where emission reduction claims are made for same emission reductions | Cost (to the project) of lower-carbon content fuel or materials |
| Improvements in traffic flow to reduce GHG emissions per unit transported (e.g. toll roads) | Road repair projects.<br>Improvements in traffic flow in one area that could lead to increased congestion in another.<br>Improvements in traffic flow where clear evidence of GHG savings cannot be provided. | Cost of technology and infrastructure relating to traffic flow improvements (but not other road improvements). |
| Traffic management to reduce GHG emissions per unit transported (e.g. speed limits, high occupancy vehicles, cars to buses). | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Changes in traffic management where clear evidence of GHG savings cannot be provided | Cost of planning, awareness raising initiatives, subsidies and incentives for road users and monitoring/ enforcing (but not costs borne by road users) |
| Shift to lower-carbon modes of road and highway transport including research & development | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Shifts where clear evidence of GHG savings cannot be provided. | Cost of making the shift, including research planning and/ or construction of low carbon alternatives |

| | | |
|---|---|---|
| High-efficiency, heavy-duty or light-duty vehicles retrofit (including the use of lower-carbon fuels, electric or hydrogen technologies, etc.). | Use of vehicles that are better than existing, but that perform worse than standard practice benchmarks.<br>Use of biofuels where emission reduction claims are made for same emission reductions. | Cost (to the project) of qualifying vehicles and fuel |
| Road freight logistics projects that streamline logistics and reduce empty running | Logistics projects that do not reduce fuel consumption. | Cost of projects |
| Information campaigns and training to influence driver behaviour | Road safety campaigns or other campaigns that do not aim to reduce fuel consumption. | Cost of campaigns |
| **Rail Transport/ Stations** | | |
| or construction of new lines, leading to shifting freight or passenger transport from road to rail).<br>New railway lines for electricity based railcars.<br>Convert diesel or coal railcars to electric.<br>Introduce lower carbon engine/vehicle technologies.<br>Improve and expand rail networks, locomotives and wagons to reduce GHG intensity per unit of transported (goods and people) (e.g. introduction and expansion of high speed trains).<br>Rail retrofit. | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Changes where clear evidence of GHG savings cannot be provided. | Cost of changes |
| **Water & Fluvial Transport/ Ports** | | |
| Waterways transport (improvement of infrastructure for inland waterway transport or short-sea shipping, or construction of new infrastructure, leading to shifting freight or passenger transport from road to waterways) | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Changes where clear evidence of GHG savings cannot be provided. | Cost of changes |
| Research & development to reduce the GHG intensity in sea and lake bound transport operations | Research that does not relate directly to reducing GHG emissions. | Cost of research |
| **Urban Transport** | | |
| Urban traffic management to reduce GHG emissions per unit transported (e.g., speed limits, high-occupancy vehicle lanes, congestion charging/road pricing, parking management, restriction or auctioning of license plates, car-free city areas, low-emission zones) | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Changes in traffic management where clear evidence of GHG savings cannot be provided. | Cost of planning, awareness raising initiatives, subsidies and incentives for road users and monitoring/ enforcing (but not costs borne by road users) |
| Shift from high carbon to lower-carbon modes of transport (expand bus, rapid transit and other mass transit systems - mass transit systems that serve peripheral areas qualify only if mechanisms exist to avoid urban sprawl) | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Shifts where clear evidence of GHG savings cannot be provided. | Cost of making the shift, including research, planning and/ or construction of low carbon alternatives. |

| | | |
|---|---|---|
| Shift from high carbon to lower-carbon modes of transport (expand bus, rapid transit and other mass transit systems - mass transit systems that serve peripheral areas qualify only if mechanisms exist to avoid urban sprawl) | Changes that lead to adverse consequences elsewhere that are not quantified.<br>Shifts where clear evidence of GHG savings cannot be provided. | Cost of making the shift, including research, planning and/ or construction of low carbon alternatives. |
| Integration of transport and urban development planning (dense development, multiple land-use, walking communities, transit connectivity, etc.), leading to a reduction in the use of passenger cars | Integration where clear evidence of GHG savings cannot be provided | Costs of integration |
| Urban center renewal projects focused on attracting city dwellers back to urban centers, leading to a reduction in the use of passenger cars (in cities where centers have been partially deserted). | Urban renewal where clear evidence of GHG savings cannot be provided | Costs of provision of new transport infrastructure only |
| Research and development of lower-carbon modes of urban transport | Research on air quality.<br>Research that is not directly related to GHG emission savings. | Cost of the components of relevant research projects or programmes |
| **General Transportation** | | |
| Shift from high carbon to lower-carbon transport modes such as from airplanes to trains, from cars to busses, from busses to trains and from trains to bicycles and walking | Shifts where clear evidence of GHG savings cannot be provided | Cost of making the shift, including research, planning and/ or construction of low carbon alternatives |
| Improve traffic flow to reduce carbon emission per unit transported | Road repair projects.<br>Improvements in traffic flow in one area that could lead to increased congestion in another<br>Improvements in traffic flow where clear evidence of GHG savings cannot be provided. | Cost of technology and infrastructure relating to traffic flow improvements (but not other road improvements) |
| Substitution of high carbon by lower carbon or non-fossil fuels thereby reducing carbon intensity per kilometer travelled | Use of biofuels where emission reduction claims are made for same emission reductions.<br>Use of non-fossil fuels where whole of life production and combustion related GHG emissions exceed whole of life production and combustion related GHG emissions for fossil fuels. | Cost (to the project) of qualifying vehicles and fuel |
| R&D in low-carbon or non-fossil fuel transport technologies | Research on (prevention of) pollution that is not caused by GHG emissions.<br>Research that is not directly related to GHG emission savings. | Cost of the components of relevant research projects or programmes |
| Improve vehicle emission standards | Improvement in reduction of particulates, sulphur dioxide or any non-GHG related emissions | Cost of planning, implementation, monitoring and enforcing |
| Improve fuel efficiency standards | Use of technologies that are better than existing ones, but that perform worse than standard practice benchmarks | Cost of planning, implementation, monitoring and enforcing |

Source: AfDB (2013), pp. 22-25

## 7.3 Urban Development and Housing

**A1: ULGDP II Components**

| Infrastructure/Service | Type |
|---|---|
| **Roads** | *Expenditure group 1*<br>• Cobblestone, gravel and red ash roads.<br><br>*Expenditure group 2*<br>• Rehabilitation of roads<br>• Bridges, fords and culverts<br>• Pedestrian walkways<br>• Street lighting, etc.<br><br>*Construction or rehabilitation of roads that require significant resettlement of people (more than 200 people) will not be eligible for funding under the ULGDP II.* |
| **Integrated multiple infrastructure and land services (residential, micro and small enterprises, industrial zones)** | *Expenditure group 3*<br>• Servicing of land with utilities (water supply, electricity, telecommunications, roads and drains (within existing right of way), solid and liquid waste collection and disposal, and other core urban infrastructure). |
| **Sanitation (liquid waste)** | *Expenditure group 4*<br>• Sewer reticulation systems (no large canals[27])<br>• Wastewater treatment ponds<br>• Sludge ponds<br>• Community soak away pit and septic tanks<br>• Community latrines: dry pit, ventilated improved pit, ecosan, composting<br>• Vacuum trucks, vacuum handcarts, and the like. |
| **Solid waste management** | *Expenditure group 5*<br>• Collection trucks and other collection equipment, collection bins, transfer stations, collection points |

| | |
|---|---|
| | • Landfills (of the size of maximum 10 hectares and minimum design criteria as per the solid waste management manual)<br>• Biogas and composting plants<br>• Landfill site equipment including compaction vehicles, and the like. |
| **Urban drainage** | *Expenditure group 6*<br>• Drainage systems<br>• Flood control systems, and the like. |
| **Built facilities** | *Expenditure group 7*<br>• Urban markets with associated services (water supply, drainage, access roads, and the like)<br>• Development of production and market centers for small businesses<br>• Slaughter houses (abattoirs), with by-products and processing facilities. |
| **Urban parks and greenery** | *Expenditure group 8*<br>• Support to urban parks and greenery development projects for beautification. |
| **Consultancy services for design and contract management** | *Expenditure group 9*<br>• For studies relating to preliminary and detailed design, contract documentation and supervision relating to the above infrastructure and services, and the like. |
| **Capacity Building Support** | *Expenditure group 10*<br>• Up to 5 percent of investment grants can be utilized on capacity building support, see menu for capacity building support below. |

Source: Ethiopia: Second Urban Local Government Development Program

**A2:** Examples of adaptation activities relevant for the urban sector

| | Non-qualifying elements | Qualifying costs |
|---|---|---|
| **Railways Transport** | | |
| The development of flood-related contingency plans for road or rail traffic management | Normal traffic planning activities<br>Contingency planning for non-climate related scenarios<br>Measures to improve traffic flows | Cost of flood-related contingency planning |
| Improvement in frequency of drain and culvert maintenance | Normal maintenance measures<br>Reinstatement of normal maintenance measures after a period of neglect | Cost of maintenance measures that provide necessary climate resilience (normal plus additional) |
| Change in culvert and roadside drainage system design specification | Roadside and rail drainage systems that have not been designed to cope with an increase in intensity or period of rainfall | Entire cost of climate resilient works |
| Fortification of existing bridge supports | Bridge rehabilitation projects that do not involve the use of additional fortification for roads and railways | Cost of bridges that are strengthened to |

| | | |
|---|---|---|
| | | specifications that go beyond standard practice |
| Modification of proposed bridge design (e.g. use designs that can withstand greater flows, longer spans to bridge unstable river banks) | Standard bridge designs that have not been modified to take account of future river flows | Cost of bridges that are strengthened to specifications that go beyond standard practice |
| Fortification of existing valley or coastal roads or railways (e.g. use of gabions, concrete walls) | Cost of bridges that are strengthened to specifications that go beyond standard practice | Cost of sections of road/ railway that are strengthened to specifications that go beyond standard practice |
| Changes to road and railway design to increase stability and resilience to erosion (e.g. changing composition of base materials, reduction in cut and fill slope angles, use of stabilization materials) | Designs that have not been modified to take account of future rainfall conditions or river flows | Cost of sections of road/ railway that are strengthened to specifications that go beyond standard practice |
| Realignment of roads/ railways to avoid areas that could become prone to flood, erosion or landslip in the future. | Sections of roads/ railway where the alignment decision is not influenced by climate change considerations | Cost of sections of road that have been realigned |
| **Urban Transport** | | |
| Change in choice of pavement to maximise infiltration/ reduce runoff | Gravel/ unpaved roads | Entire cost of road sections bearing high porosity pavement |
| **General Transportation** | | |
| Transport planning and associated construction to avoid areas that could become prone to flood, erosion or landslip in the future | National or local transport planning that does not consider climate change issues in detail | Cost of development of a climate resilient national or local transport plan, or similar. |
| Transport planning and associated construction to avoid areas (e.g. forests) whose climate resilience could be harmed directly or indirectly by the proximity of new transport links; or to avoid adverse effects of new transport links on these areas. | Alteration of routes in response to ESIA findings, except where the ESIA specifically highlights the fact that the area or community is vulnerable to climate change AND that the transport plan will exacerbate this vulnerability. | Cost of development of a climate resilient national or local transport plan, or similar and/or Cost of construction of affected routes. |

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| Transport planning and associated construction activities that are part of emergency planning for climate related disasters | General emergency planning (unless covered by other sectors).<br>Transport planning and construction that is not carried out in response to climate change related emergencies. | Cost of development of the transport component of an emergency plan, or similar.<br>Cost of construction of affected routes. |
| Research into engineering design and materials to improve performance under future climate | Research not related to transport.<br>Research that does not address a problem related to climate. | Cost of the relevant components of the research project or programme. |

Source: AfDB (2013), pp. 16-20