TRIPLELINE

Final Evaluation of Fast Track Investment Projects in Ethiopia

Ethiopia Climate Resilient Green Economy (CRGE) Facility

Evaluation Report

Final Version

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List of abbreviations and acronyms

AF	Adaptation Fund
BAU	Business as Usual
CBO	community-based organisation
CHIP	Climate High-Level Investment Programme
CSA	climate smart agriculture
COP	Conference of Parties
CRGE	Climate Resilient Green Economy
CR-WASH	Climate Resilient-WaSH
CSO	civil society organisation
DAC	Development Assistance Committee
DDA	Dire Dawa Administration
DFID	Department for International Development
EFCCC	Environment, Forests and Climate Change Commission
EPACC	Ethiopian Programme of Adaptation to Climate Change
EPSE	Ethiopian Petroleum Supply Enterprise
ESS	environmental and social safeguards
ETB	Ethiopian birr
FDG	focus group discussion
FIEs	Federal Implementing Entities
FTI	Fast Track Investment
GCF	Green Climate Fund
GDP	Gross Domestic Product (GDP)
GGGI	Global Green Growth Institute
GHG	greenhouse gas
GIS	Geographic Information System
GoE	Government of Ethiopia
GLI	Green Legacy Initiative
GTP	Growth and Transformation Plan
HGER	Homegrown Economic Reform Agenda
IMF	International Monetary Fund

INDC	Intended Nationally Determined Contribution
INRM	Integrated Natural Resource Management
IPDC	Industrial Parks Development Corporation
KII	key informant interview
LTSP	Long-Term Strategic Plan
M&E	monitoring and evaluation
MoA	Ministry of Agriculture
MoTI	Ministry of Trade and Industry
MoT	Ministry of Transport
MoU	Memorandum of Understanding
MoUDH	Ministry of Urban Development and Housing
MoWIE	Ministry of Water, Irrigation and Energy
MRV	Monitoring, Reporting and Verification
MSIP	Multi Sector Investment Plan
MTCO2e	metric tons of carbon dioxide equivalent
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contribution
NEP	National Electrification Programme
NMT	non-motorised transport
OECD	Organisation for Economic Co-operation and Development
O&M	operations and maintenance
PCM	project cycle management
PDORD	Petroleum Downstream Operations Regulatory Directorate
PEFA	Public Expenditure and Financial Accountability
PPP	public–private partnership
PPCR	Pilot Program for Climate Resilience
PV	photovoltaic
RBF	Results-Based Funding
REDD	Reducing Emissions from Deforestation and forest Degradation
RoI	Return on Investment
SME	small and medium-sized enterprise
SNNPR	Southern Nations, Nationalities, and Peoples' Region

QA	quality assurance
RIEs	Regional Implementing Entities
TA	technical assistance
tCO2e	tonnes of carbon dioxide (CO2) equivalent
ToC	Theory of Change
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
US$	United States Dollar
VfM	Value for Money
WHO	World Health Organization

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Executive summary

The Climate Resilient Green Economy (CRGE) Facility in collaboration with the Global Green Growth Institute (GGGI) as part of the Green Climate Fund (GCF) Readiness Project commissioned this final evaluation of Fast Track Investment (FTI) projects to identify achievements made, success stories and lessons that can inform the development of similar CRGE projects and programmes.

Ethiopia adopted a CRGE Strategy in 2011 as part of its ambitious plan to achieve middle-income status by 2025. A critical part of the CRGE institutional arrangement has been the CRGE Facility which was established in 2012 within the Ministry of Finance (MoF) as the primary financial vehicle to mobilise, access and combine domestic and international, public and private sources of finance to support the institutional building and implementation of the CRGE Strategy.

The CRGE Facility mobilised US$ 18.63 million for 27 FTI projects implemented from July 2014 to March 2017 across Ethiopia in 13 cities and 74 woredas.

The FTI process was designed to operationalise the implementation of the CRGE Strategy in priority sectors. FTI projects allowed the testing of CRGE Facility's processes and systems to provide rapid and iterative feedback for implementation modalities on the ground.

FTI projects have contributed towards mitigating GHG emissions, boosting renewable energy generation capacity and energy efficiency, improving forest management, strengthening land and water resources management, increasing rural incomes, and creating green jobs.

The FTI projects have done so with genuine CRGE Facility leadership and integration with national policies and priorities, while also spurring greater cooperation between the federal implementing entities and region/woreda level departments and bureaus.

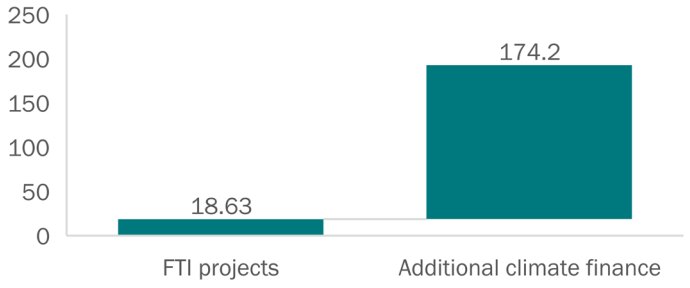
FTI projects employed a wide range of approaches, amongst others, technical assistance, institutional strengthening and capacity building at national, regional and woreda levels, pilots and physical interventions, and climate/hydrological data and information systems for use in decision-making.

Underpinning the FTI approach were the four CRGE inter-dependent strategic enablers:

- Gender and age disaggregated data and information for decision support, including climate information, vulnerability and capacity assessments, and gender analysis.
- GHG Inventory and Measurement, Reporting and Verification (MRV) systems.
- Climate and green economy policies, plans and regulations.
- Knowledge, skills and capacities.

The FTI process has provided significant learning opportunities to inform climate programming in Ethiopia and the prospect of leveraging additional climate funding, through more efficient use of Government of Ethiopia (GoE) resources and the attraction of additional resources into the CRGE Facility from bilateral development partners and multilateral climate funds under the United Nations Framework Convention on Climate Change (UNFCCC). The CRGE Facility has administered over US$ 190 million of investments, including US$ 60 million funding from the Green Climate Fund (GCF) and Adaptation Fund (AF).

The governance and management structure of the CRGE Facility has continued to evolve since the period of execution of the FTI projects. The CRGE Facility has embarked on further articulating its institutional arrangements and building its fiduciary management capabilities for project and programme management, financial reporting, and environmental and social safeguards (ESS) systems and procedures.



Climate finance mobilised by the CRGE Facility since 2013 (in US$ million)

The 27 FTI projects reflected a broad portfolio of activities, which have been largely effective in achieving their objectives. The table below summarises broad outcome areas by CRGE sector where FTI projects achieved significant results.

Ministry of Agriculture (MoA)	Ministry of Urban Development and Construction (MoUDC)	Environment, Forests and Climate Change Commission (EFCCC)	Ministry of Water, Irrigation and Energy (MoWIE)	Ministry of Trade and Industry (MoTI)	Ministry of Transport (MoT)
Adoption of climate smart agriculture, crop diversification and mixed farming for higher food security and farmer income while reducing emissions	Urban greenery development and solid waste management to mitigate urban pollution and GHG emissions	Rehabilitation of degraded lands, leading to enhanced green environmental condition and thereby ensuring additional carbon sequestration	Providing sustainable water to local communities in environmentally friendly manner with lower lifecycle costs, by replacing diesel powered water pumping systems with solar	Identified technologies to improve energy efficiency and reduce GHG emissions in five manufacturing sub-sectors (cement, textile and leather, steel and metal, food, and pharmaceutical)	Demonstrated off-street parking solutions as instrument to improve traffic flow and reduce emissions

Overall, FTI projects played an important role in incrementally contributing towards Ethiopia's CRGE vision of becoming a middle-income country by 2025, through economic growth that is resilient to climate change and results in no increase in carbon emissions, whether directly through tangible outcomes, or indirectly by opening the door for other interventions to support longer term impacts.

The table below reflects higher-level results of the 27 FTI projects summarised by the evaluation team from FTI reports.

274,414 total direct beneficiaries

43% of beneficiaries were women or girls

12,083 hectares of land cultivated using climate smart agriculture (CSA) practices

2,289 (tCO_2) GHG emission reduction

Significantly more investments will be required if CRGE Strategy's ambitious goals are to be met. Accordingly, the role and resource requirements for the CRGE Facility to support these developments will increase. Resource mobilisation needs to be scaled up and best practices from the FTI process need to be replicated. The forthcoming accreditation upgrading application to the GCF is particularly relevant in this regard.

The evaluation makes the following recommendations:

- **Recommendation #1:** Strengthen resource mobilisation approaches to promote access to climate finance at scale.
- **Recommendation #2:** Continue to support multi-sector programmatic approaches for a more strategic and results-oriented way for delivering climate finance.
- **Recommendation #3:** Continue to support operationalisation of the CRGE Facility's M&E framework and Results Based Management (RBM) processes to improve project and programme delivery and strengthen results management and accountability.
- **Recommendation #4:** Continue to support the refinement and operationalisation of detailed MRV of projects and programmes to allow for measurement of GHG mitigation impacts and co-benefits.
- **Recommendation #5:** Continue to support the refinement and operationalisation of ESS systems and procedures.
- **Recommendation #6:** Consider stronger private sector involvement role in climate change mitigation and adaptation projects and programmes.
- **Recommendation #7:** Incorporate explicit exit strategies into each new project or programme in order to improve sustainability.

Report sections alignment with OECD Development Assistance Committee (DAC) Quality Standards for Development Evaluation

DAC standard	Report section				
	Section 3 (context)	4 (portfolio analysis)	5 (case studies)	6 (strategic findings)	7 (recommendations)
Relevance				6.1	
Efficiency				6.2	
Effectiveness				6.3	
Impact				6.4	
Sustainability				6.5	

1 Introduction

1.1 Evaluation background

Ethiopia adopted a **Climate Resilient Green Economy (CRGE) strategy** in 2011 as part of its ambitious plan to achieve middle-income status by 2025. Since its inception, the CRGE strategy has facilitated the creation of permanent institutional structures, the establishment of a national Monitoring, Reporting and Verification (MRV) system and registry, and the identification of over sixty initiatives, which could help Ethiopia achieve its development goals while limiting national greenhouse gas (GHG) emission levels and building resilience.

The CRGE strategy follows a **sectoral approach based on the following four pillars**:

1. **Agriculture:** improving crop and livestock production practices to ensure food security and improvement in farmers' livelihoods while reducing emissions
2. **Forestry:** protecting and re-establishing forests for their economic and ecosystem services, including as carbon stocks
3. **Power:** expanding electricity generation from renewable sources of energy for domestic and regional markets
4. **Transport, industrial sectors and infrastructure:** leapfrogging to modern and energy-efficient technologies in transport, industrial sectors, and buildings.

A critical part of the CRGE institutional arrangement has been the **CRGE Facility** which was established in 2012 within the Ministry of Finance (MoF) as the primary financial vehicle to mobilize, access and combine domestic and international, public and private sources of finance to support the institutional building and implementation of the CRGE strategy.

The **Fast Track Investment (FTI) process** was created in 2014 to (i) demonstrate the systems and potential of the newly established CRGE Facility; (ii) promote CRGE mainstreaming into existing sectoral development initiatives; and (iii) empower the Government of Ethiopia (GoE) to prioritise its own climate resources.

This process allocated funds to projects in high priority CRGE sectors represented by the Environment, Forests and Climate Change Commission (EFCCC), the Ministry of Agriculture (MoA), the Ministry of Trade and Industry (MoTI), the Ministry of Transport (MoT), the Ministry of Urban Development and Construction (MoUDC) and the Ministry of Water, Irrigation and Energy (MoWIE).

From July 2014 to March 2017, **27 Fast Track Investment (FTI) projects were implemented in all regional states and two city administrations**. The United Kingdom's Foreign, Commonwealth and Development Office (FCDO) (formerly Department for International Development (DFID)) was one of the early financers of the CRGE Facility in 2014 with approximately US$ 18 million of un-earmarked fast track non-budget support for the implementation of 26 FTI projects across the key CRGE sectors. Additional funding was later provided by the Government of Austria.

The CRGE Facility in collaboration with the Global Green Growth Institute (GGGI) as part of the Green Climate Fund (GCF) Readiness Project commissioned this final evaluation of FTI projects to identify achievements made, success stories and lessons that can inform the development of similar CRGE projects and programmes. The Terms of Reference (ToR) for the evaluation can be found in Annex 1.

1.2 Purpose and scope of the evaluation

The **purpose** of the final evaluation is to provide an external and retrospective assessment of the extent and magnitude of project impacts, assess project performance, and the implementation of planned project activities and planned outputs against actual results of selected FTI projects.

The evaluation is intended to be **forward looking in order to capture lessons learnt** and provide information on the nature, extent, and where possible, the impact and sustainability of interventions. The emphasis on learning lessons speaks to the issue of understanding what has, and what has not worked as a guide for future programming.

The **four primary objectives** of the evaluation are to:

1. To **assess performance** of FTI projects against their planned activities and expected results at output and outcome levels.
2. To **obtain an indication of higher-level impact of the FTI projects**, where possible, taking advantage of the fact that the funding period concluded over three years ago, allowing the possibility for broader, longer-term impacts to be manifested.
3. To **identify success stories and lessons** from FTI projects implementation, and formulate practical recommendations for future development of similar CRGE projects.
4. To provide evidence and recommendations to **help strengthen CRGE Facility's forthcoming accreditation upgrading application** to the GCF (Box 1).

Box 1: The GCF accreditation process

The MoF is Ethiopia's Accredited Entity (AE) to the GCF, and established the CRGE Facility to channel climate finance to projects on the ground.

Ethiopia is currently accredited for "Small (up to US$50 million)" size of an individual project or activity within a programme; "Basic" fiduciary functions; and "Category B" environmental and social risk category.

The MoF is now seeking to upgrade its accreditation scope to the "Large (up to US$250 million)" size category of projects or programmes and "Specialized fiduciary standards" for grant award and/or funding allocation mechanisms.

During the accreditation upgrading process, Ethiopia's AE's policies and procedures, track record, and demonstrated capacity to undertake projects or programmes of different financial instruments and environmental and social risk categories will be assessed against the GCF standards.

The evaluation has as its **primary user** decision makers at the CRGE Facility who managed the FTI projects. The final evaluation report is one of the main documents that will be submitted to the GCF by the MoF as part of its Accreditation upgrading application.

Secondary evaluation users include CRGE sector ministries and their replicas at the regional and woreda levels, FTI donors (UK, Austria), the GGGI that has been supporting the CRGE Facility and commissioned this evaluation, and the wider development community.

The final evaluation builds on a review delivered by LTS International and B&M Development Consultants, which reviewed DFID's investment to the Government of Ethiopia's CRGE Facility and wider policy engagement and technical advice to GoE.[1]

1.3 Report structure

The evaluation report is structured into **six main sections**:

- Section 2 presents the evaluation's approach and methodology
- Section 3 provides the context to the CRGE Facility and FTI projects
- Section 4 explores trends in the FTI portfolio as a whole
- Section 5 presents the case studies for nine FTI projects
- Section 6 considers cross-projects issues and presents strategic evaluation findings
- Section 7 presents recommendations for the CRGE Facility.

A number of annexes provide additional key information.

[1] The UK supported Ethiopia to plan and implement the CRGE vision through its Climate High-Level Investment Programme (CHIP) by providing GBP 13 million direct funding to the CRGE Facility combined with wider policy engagement and technical advice to GoE. The CHIP programme was implemented from 2013 to 2016.

2 Approach and methods

2.1 Evaluation approach

A central feature of Triple Line's evaluation approach is being **utilisation-focused**. This ensures that the evaluation will serve the practical information needs of the CRGE Facility, and can be used to inform future programming decisions, particularly with regards to the forthcoming **GCF accreditation upgrading application**.

The FTI projects tackle complex problems in particular socio-economic contexts. They also involve emergent and responsive strategies and causal processes across multiple CRGE sectors and Ethiopian regions. The best evaluation approach for this type of interventions is a **theory-based approach**, which assesses effectiveness and the likelihood of impact from the interventions using theory of change (ToC) perspectives (the CRGE strategic outcomes map is introduced in Section 3).

A critical element of our approach is the use of **case studies**. In a representative subset of 9 FTI projects (one-third of the total), a more in-depth evaluative approach was employed.

The evaluation adopted a **mixed methods approach**, using both qualitative (document review, key informant interviews (KIIs), field visits, and observations) and quantitative data and analysis where available (portfolio/project data, including results framework data).

Lesson learning for future programming has been prioritised within the evaluation and has been incorporated across the evaluation both in relation to the FTI portfolio and case studies.

2.2 Evaluation framework

The evaluation was guided by an **evaluation framework** following the **OECD Development Assistance Committee (DAC) Quality Standards for Development Evaluation**. This framework serves as a conceptual foundation for the evaluation, describing the general approach envisioned for answering each evaluation question, the evidence that may be collected, and the expected sources of that information. Table 1 presents the **main evaluations questions.** The complete list of the evaluation questions can be found in **Annex 2.**

Table 1 Evaluation framework

DAC standard	Main evaluation questions	Data source / analytical tool
Relevance	To what extent were the objectives and design of FTI projects aligned with national green growth and resilience priorities and concerns, including the Government of Ethiopia's ability to deliver its CRGE vision and strategy?	Document review of GoE strategy documents and plans, sector FTI project proposals or investment plans Interviews with Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Interviews with non-GRCE facility sector programmes and donors Case study analysis
Efficiency	Have the FTI projects been delivered according to plan and on budget?	Review of sector FTI project proposals or investment plans, financial data, project budgets, expenditure reports, Performance Indicator Reference Sheets, quarterly and annual reports, and project closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE

		Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Portfolio mapping Case study analysis
Effectiveness	What tangible outcomes (intended and unintended) have the FTI projects achieved?	Sector FTI project proposals or investment plans Review of financial data, project budgets, expenditure reports, Performance Indicator Reference Sheets, quarterly and annual reports, and project closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities Interviews with beneficiary groups Portfolio mapping Case study analysis
Impact	What is the most identifiable impact of FTI projects and how are they perceived by other executing agencies and partners?	Sector FTI project proposals or investment plans Review of financial data, project budgets, expenditure reports, Performance Indicator Reference Sheets, quarterly and reports, mission reports, and project closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Interviews with beneficiary groups Case study analysis
Sustainability	To what extent have the results and impacts of FTI projects been sustained?	Sector FTI project proposals or investment plans Review logic models for assumptions and elements related to sustainability Assessment of plausibility of sustainability in case studies Review of project/programme closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Interviews with beneficiary groups Case study analysis

2.3 Data collection methods

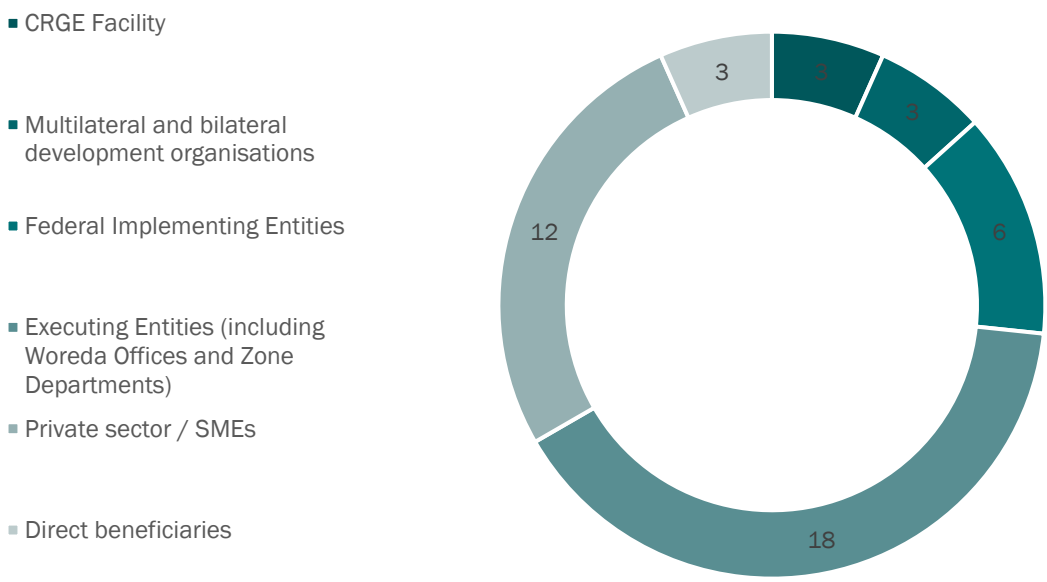
To answer the evaluation questions, the evaluation team drew on primary data from key informant interviews (KIIs) and field visits, secondary data from the review of CRGE Facility and FTI project documentation, and where appropriate, third-party data sources (grey literature, etc.). To avoid bias and to capture different perspectives, the evaluation team collected qualitative and, where it existed, quantitative data from different sources.

The evaluation relied on existing CRGE Facility Monitoring and Evaluation (M&E) tools and data for reporting results in the aggregate (i.e., across all sectors or projects). Where quantitative targets exist for a FTI project, the evaluation reports results achieved against that target.

A list of the overall combined portfolio of the 27 FTI projects covered in the evaluation is provided in **Annex 3**. **Annex 4** includes a list of key documents that were made available to the evaluation team.

More than 80 stakeholders were consulted for this evaluation (see Figure 1).

Figure 1 Stakeholder interviews by stakeholder group



To support the preparation of case studies the evaluation team conducted field visits to seven woredas in Ethiopia's three out of 10 administrative regions, and one out of two city administrations, under strict COVID-19 protocols.

In addition, a validation workshop with representatives from the CRGE Facility and all sectors (federal implementing entities), the GGGI, and the Triple Line evaluation team was held in Addis Ababa, which presented and discussed the findings and recommendations of an earlier version of the final evaluation report.

A complete list of stakeholders interviewed is available in **Annex 5**.

2.4 Data analysis tools

The Triple Line team utilised several analytical methods aimed at identifying key findings and demonstrating a clear evidence chain. Methods of analysis included contextual analysis, portfolio mapping, qualitative analysis of stakeholder input, hypothesis building and testing, outcomes harvesting (see Box 1), and case study analysis.

Findings of the case study, and evidence from additional interviews, the portfolio mapping and document review were then mapped against the main evaluation questions and analysed.

Box 1: Outcomes harvesting

Outcome harvesting is a participatory approach that helps to identify, verify, analyse and interpret outcomes or higher-level results in contexts where relations of cause and effect are not fully understood. It collates evidence of what has changed but it does not measure progress towards predetermined objectives or outcomes. The Triple Line team collected higher-level results and the most significant change stories for case studies from FTI project stakeholders, including project intermediaries and target/beneficiaries.

2.5 Limitations

The evaluation team is confident that the adopted approach and data analysis tools have resulted in sufficient evidence to make strong and robust findings. However, four key limitations should be borne in mind:

- **Stakeholder availability.** Actual conduct of interviews depends on stakeholder willingness and availability. To meet the overall schedule for the evaluation, the evaluation team had a limited window during which to conduct KIIs and field visits, and not all stakeholders were available during that window. In addition, staff turnover, particularly in government offices, limited the team's access to specific individuals who were directly engaged in FTI activities. To mitigate this risk the Triple Line team applied a purposive sampling for selection of key informants and created a flexible interview scheduling process.
- **Potential for respondents' recall bias.** One risk to the evaluation was key informants' ability to remember, and remember accurately, events that may have happened as many as five years ago. Institutional memory is often particularly weakened by staff turnover, as mentioned above. Recall can also be influenced by institutional, political, or social interests. To improve reliability, the evaluation team endeavoured to set the scene carefully with key informants and triangulated with other data collected.
- **Lack of a baseline or stated expectations for outputs and outcomes against which evidence of progress could be measured.** This issue is not unique to FTI projects. Other initiatives and programs working on climate resilience and green growth issues have also grappled with developing approaches for measuring results. Many FTI proposals do not describe expected outputs or outcomes in terms that are conducive for meaningful evaluation. As a result, it was not possible to assess outputs and outcomes against "plan" consistently. Instead, the evaluation supplemented proposals with FTI program documentation along with expert judgment and the application of outcomes harvesting to make determinations about reasonable expectations for results given the implemented activities. Attribution of change and assessing the contribution of FTI projects has been challenging as a result of the design and management of the results framework described above, and the resulting availability of data to assist with assessments of project attribution. The evaluation team supplemented available data with a variety of additional primary data and used different data analysis tools to triangulate findings in terms of how successful FTI projects have been in terms of outcomes or contribution within the resource limits of the evaluation. Given these challenges, the evaluation is in a position only to measure likely or potential, rather than actual, impacts of the FTI projects.
- **The COVID-19 pandemic and the consequent disruption required modification of the typical approach and methodology to undertake this evaluation.** The COVID-19 crisis had implications for traditional evaluation data gathering processes. Throughout the evaluation process the evaluation team followed all regulations of the Government of Ethiopia Ministry of Health and the recommendations of the World Health Organization (WHO). By necessity the duration of site visits was shortened. It was also not possible to organise focus group discussions (FGDs) with beneficiary groups as originally envisaged. Compounding these limitations, moreover, remote KIIs during the data collection phase often had to prioritise stakeholders with better connectivity and a higher degree of comfort in conducting remote interviews.

3 Overview of the FTI initiative: a look back–a look forward

This section provides the context to the CRGE Facility and FTI projects. Mapping the evolution of the CRGE Facility is important as this provides specific evidence of the way in which the FTI approach has contributed to increasing the capacity of Ethiopia to achieve its CRGE vision.

3.1 Key policy milestones

Aspiring to become a carbon neutral middle-income country by 2025

Ethiopia's development policy has delivered broad-based economic growth in real Gross Domestic Product (GDP) over a sustained period; growth averaged about 10 percent per year from 2007-08 to 2017-18.[2] Structural change, in sectoral and spatial terms (with an urbanisation rate of over 5%), has contributed to this impressive growth. The poverty reduction performance has also been remarkable, diminishing from 50 percent to 31 percent of the population between 2000 and 2015. **However, increased vulnerability to climate change and environmental risks, and other socio-economic shocks (e.g., disease, economic downturns, and now the COVID-19 pandemic), have placed downward pressure on growth**.

Ethiopia accounts for less than 0.3 percent of global emissions,[3] yet it is already experiencing the adverse effects of climate change. **Ethiopia is one of the most vulnerable countries to climate changes due to its dependence on rainfed agriculture and natural resources**. Long term climate projections suggest, overall and noting the regional variations, Ethiopia will become hotter and drier with more frequent extreme events (notably droughts, heatwaves and flooding).[4] This is expected to negatively impact progress in critical sectors such as agriculture, transportation, water, energy, and health. In Ethiopia, there is a strong acknowledgement of climate change's severe consequences, and the potential to hold back socio-economic progress or even to reverse recent gains made in the country's development.

The GoE has prioritised green and climate resilient growth. Notwithstanding the adverse consequences, climate change also offers an unprecedented opportunity for the country to leapfrog or accelerate transition to a low-carbon and sustainable development path. Ethiopia's second five-year **Growth and Transformation Plan (GTP II)**, designed to propel Ethiopia towards the realisation of its long-term vision of becoming a middle-income country by 2025, actively pursues sustainability objectives. The three-year **Homegrown Economic Reform Agenda (HGER)**, an economic reform programme launched in September 2019, and part of the Ten Years Perspective Development Plan (2021-2030), built upon the foundation laid by the GTP II. In achieving its objectives, the HGER 2021-2030 has integrated investments that are climate resilient and market solutions that are climate smart. Four main sectors have been identified to have significant potential to spur the national economy in a climate friendly manner: agriculture, transport, water and industry.

The CRGE Vision and Strategy

The **CRGE Vision** outlines Ethiopia's aspiration to build a climate resilient green economy (CRGE) by 2025.[5] Building on the CRGE Vision, the **Green Economy Strategy (CRGE Strategy)** was developed in 2011 and presented at the 17th Conference of Parties (COP) in Durban, South Africa.[6]

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[2] World Bank Online Data

[3] USAID. 2015. GHG Emissions Factsheet Ethiopia. Original data from World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2015. Emissions including Land-Use Change and Forestry.

[4] Federal Democratic Republic of Ethiopia. 2015. Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC).

[5] Federal Democratic Republic of Ethiopia. 2011. Climate Resilient Green Economy Vision.

[6] Federal Democratic Republic of Ethiopia. 2011. Ethiopia's Climate Resilient Green Economy: Green Economy Strategy.

The CRGE Strategy covers seven **sectors that offer the highest greenhouse gas (GHG) abatement potential**: Power Supply; Buildings and Green Cities; Forestry (REDD+); Agricultural/Soil-based Emissions; Livestock; Transport; and Industry.

Considering the early emphasis of the CRGE Strategy on mitigation aspects, sector specific **Climate Resilience Strategies** were subsequently developed in the period from 2012 to 2014. The Resilience Strategies built on the Ethiopia's National Adaptation Plan of Action (2007) and Programme of Action on Climate Change (2011).

Ethiopia's international climate commitments

Ethiopia ratified the Paris Agreement in 2017, thereby converting its Intended Nationally Determined Contribution (INDC) to its first Nationally Determined Contribution (NDC) with GHG emission reduction targets for 2030.

Box 2: Ethiopia's leadership on climate change

Ethiopia chaired the Climate Vulnerable Forum for the period 2016-18, an international partnership of countries most vulnerable to the consequences of climate change, as well as the Least Developed Countries climate negotiations alliance.

Ethiopia is also leading the Vulnerable 20 Group of Ministers of Finance (V20) and participating in several related initiatives, such as the New Climate Economy, the G7 Carbon Market Platform, the Carbon Pricing Leadership Coalition, and the Coalition of Finance Ministers for Climate Action.

Ethiopia's active leadership and participation in initiatives to promote resilience to climate change demonstrates its intention to intertwine the country's climate priorities with national development activities.

The INDC was developed based on the CRGE Strategy and set far-reaching short-term and long-term goals on the national adaptation and emissions reduction target. **Ethiopia submitted its updated NDC in December of 2020** to the UNFCCC which is a reflection of the high-level continued engagement in meeting with its global commitment in addressing climate change.[7]

The revised GHG emissions business-as-usual (BAU) scenario projects an increase in Ethiopia's GHG emissions to 412.1 MTCO2e by 2030 relative to 169.3 MTCO2e emissions in 2010. **The ambitious measures set out in the CRGE Strategy and updated NDC are to reduce GHG emissions below to 191.5 MTCO2e by 2030**.[8] This is equivalent to a 53.5 percent reduction in comparison to the revised BAU.[9] Ethiopia's updated NDC also covers actions in the area of adaptation, with a specific focus on strengthening the mainstreaming of adaptation and actions across all sectors and levels of governance and establishing linkages with other frameworks (including the SDGs and the Sendai Framework for Disaster Reduction).

Figure 2 in the next page provides a timeline of key milestones in the evolution of Ethiopia's climate policy.

3.2 The CRGE Facility

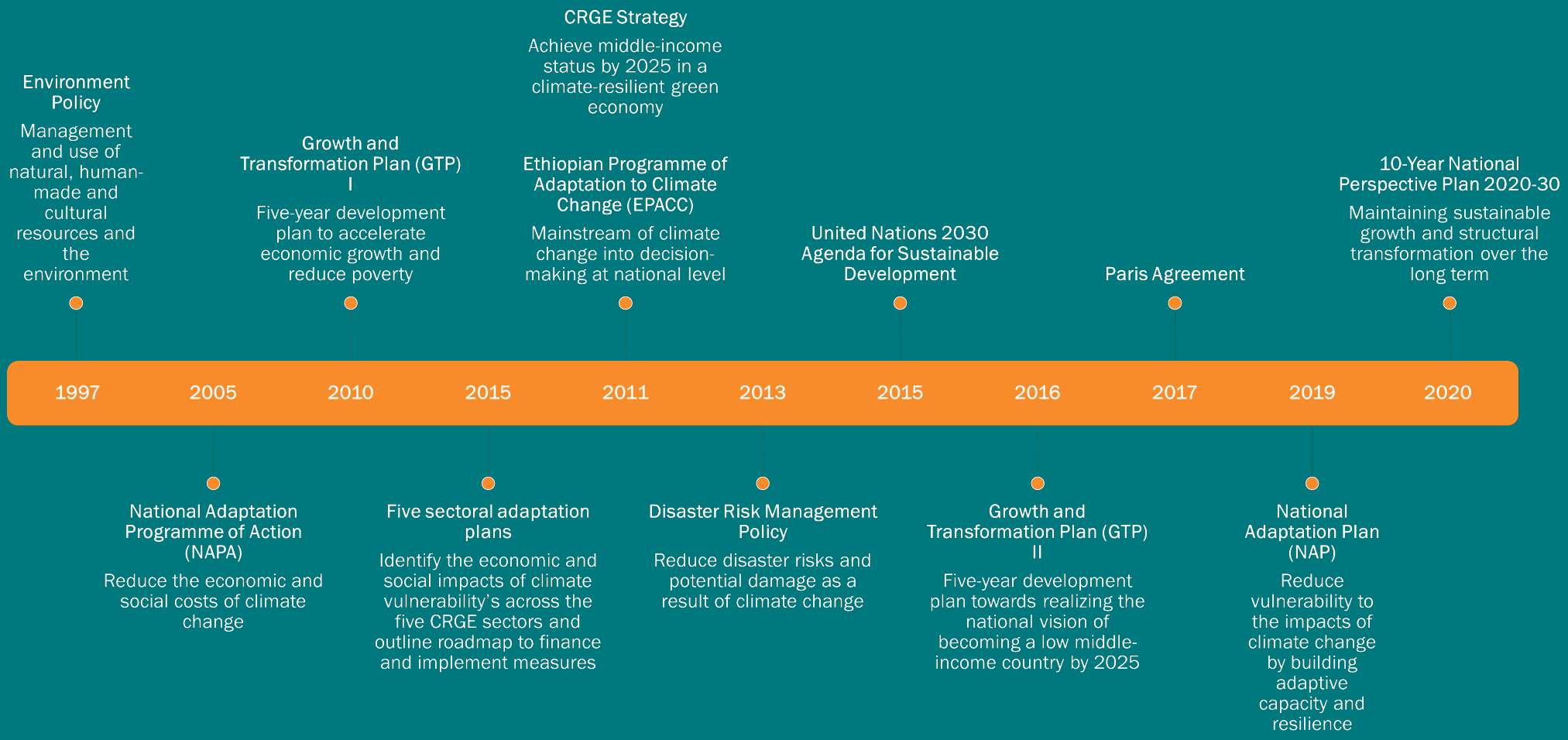
The CRGE Facility was established in 2012 and became operational in 2013 as the **primary financial vehicle to mobilise, access and combine domestic and international, public and private sources of finance to support the institutional building and implementation of the CRGE Strategy**. The CRGE Facility was designed to provide a single engagement point where the GoE stakeholders, development partners, the private sector, civil society and other stakeholders can engage and make decisions about climate change issues, thus enhancing coordination and aid effectiveness and reducing fragmentation. It is the GoE's intention that Ethiopia's development partners increasingly channel their bilateral and multilateral climate financing through the CRGE Facility.

[7] Federal Democratic Republic of Ethiopia. 2020. Summary of Ethiopia's Updated Nationally Determined Contribution (NDC).

[8] Including both conditional and unconditional interventions.

[9] Federal Democratic Republic of Ethiopia. 2020. Summary of Ethiopia's Updated Nationally Determined Contribution (NDC).

Figure 1: Key milestones in the evolution of Ethiopia's climate policy

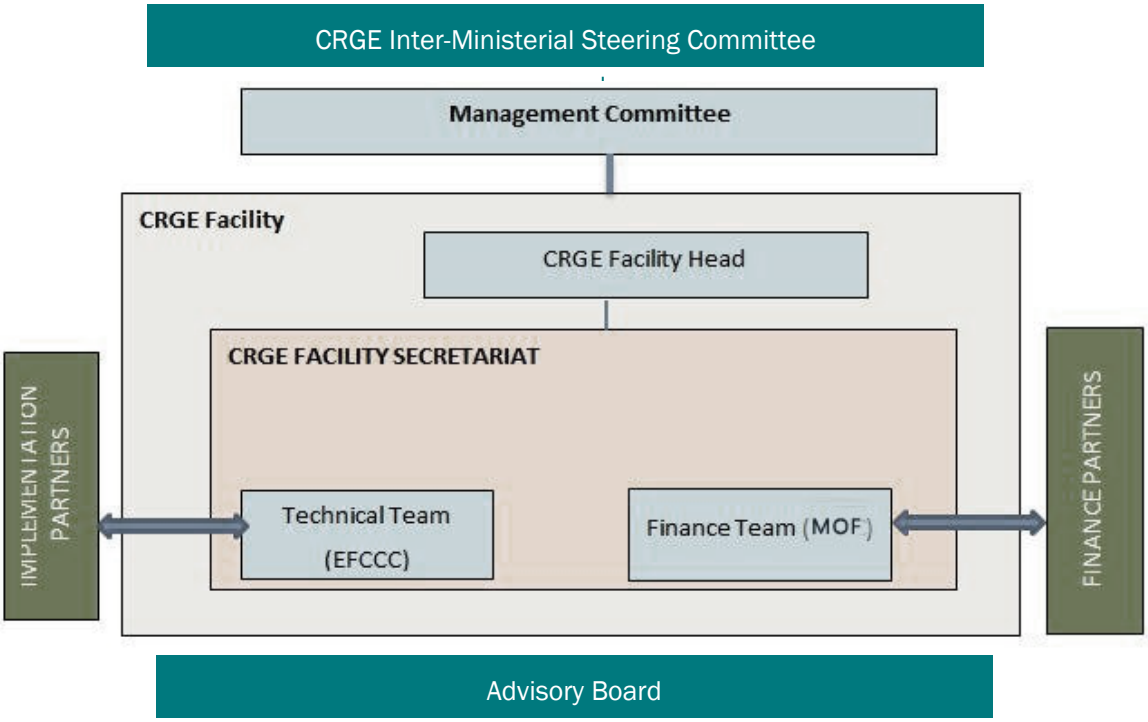


Institutional architecture of the CRGE Facility

Considering that climate change is a cross-sectoral issue and a priority, the GoE gave due attention in putting in place **governance and inter-institutional arrangements for CRGE development and implementation**.

The CRGE Facility is governed by an Inter-Ministerial Steering Committee, a Management Committee, a Technical Committee, sector implementing ministries and regional states bureaus (Figure 2). The CRGE structure also includes an Advisory Board comprised of representatives from the development partners, CSOs and academia. The MoF is responsible for the overall management and administration of resources for the CRGE Facility, ensuring financial integrity, institutional capacity building in the areas of resource management, overall monitoring and evaluation.

Figure 2 Governance of the CRGE Facility



The **Inter-Ministerial Steering Committee** is chaired by the Prime Minister's Office and more recently by the Minister of Finance. The committee is represented by the priority CRGE sectors[10] at the ministerial level and effectively facilitates cross-governmental coordination and ensures overall policy coherence. The **Management Committee**, which is co-chaired by the MoF State Minister and the EFCCC Commissioner, sets policy direction and guidance for the CRGE Facility, approves operations, ensures alignment with the CRGE Strategy and facilitates coordination with other related initiatives. All CRGE Sector Ministries are represented both at a State Minister level and a senior level technical expert from their respective CRGE Unit. The **Technical Committee** is in charge of assessing the investment plans under approval from line ministries. The **Advisory Board** has no decision-making responsibility but functions to enable stakeholders share and review information relevant to the performance of the CRGE Facility.[11]

To guide implementation of the CRGE strategy at sector level, **CRGE Units** were established within each of the priority line ministries. These units were initially setup as ad-hoc entities, mostly from the

[10] Environment, Forests and Climate Change Commission (EFCCC), the Ministry of Agriculture (MoA), the Ministry of Trade and Industry (MoTI), the Ministry of Transport (MoT), the Ministry of Urban Development and Construction (MoUDC) and the Ministry of Water, Irrigation and Energy (MoWIE).

[11] Alice Caravani, Sam Greene, Nella Canales Trujillo and Aklilu Amsalu. 2017. Decentralising climate finance: insights from Kenya and Ethiopia. BRACED Working Paper.

existing Environmental Impact Assessment (EIA) Units and/or Planning Units of a sector ministry. Currently however, the CRGE Units are re-established as **Environment and Climate Change Directorates** within their respective ministry and are responsible for project identification and screening, design, and implementation. These new directorates are more coherent and have been formalised within their respective ministries giving them better operational and budgeting links across their peer divisions. The restructuring and evolution of the sector level directorates has also enabled the CRGE Facility to improve CRGE implementation at the district level in terms of planning, programming, fund management and reporting.

The CRGE results framework

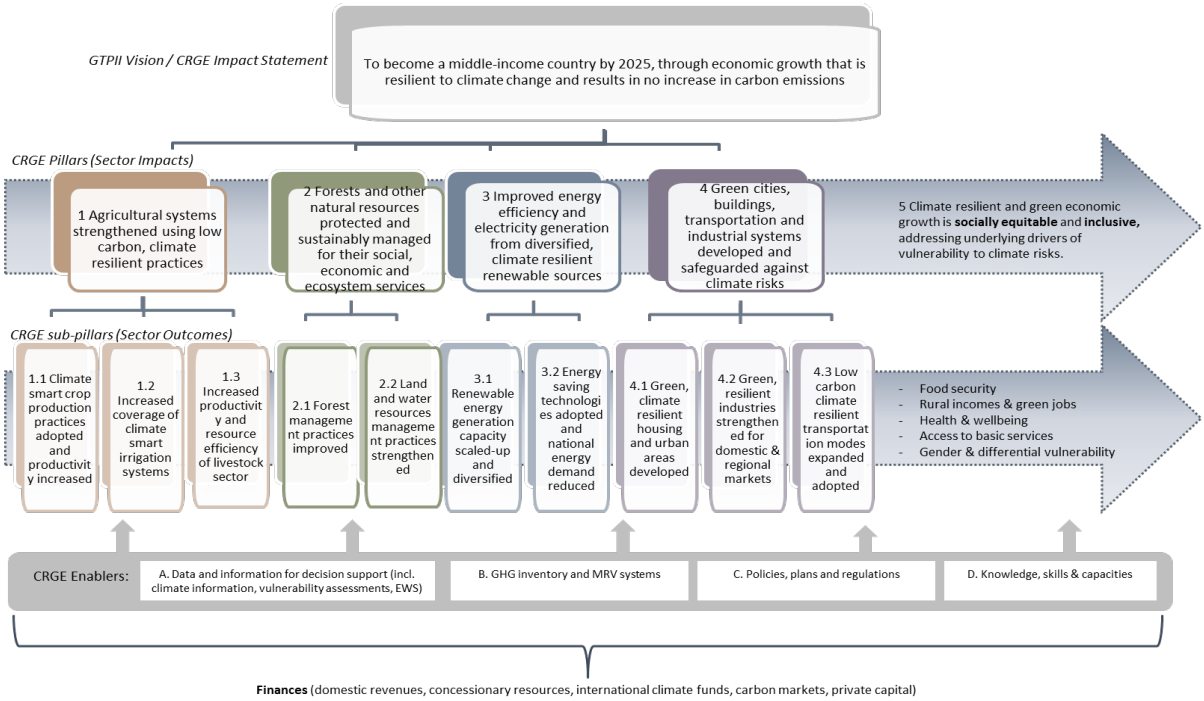
CRGE's overarching strategic outcome map (or theory of change) is valuable in setting out the contextual analysis and the CRGE sector approaches (Figure 3). Together they articulate how the CRGE Facility can achieve the intended impact of Ethiopia becoming a middle-income country by 2025, through economic growth that is resilient to climate change and results in no increase in carbon emissions.

Underpinning the CRGE approach are **four interdependent strategic enablers**:

- Gender and age disaggregated data and information for decision support, including climate information, vulnerability and capacity assessments, gender analysis and early-warning systems
- Greenhouse Gas (GHG) inventory and Measurement, Reporting & Verification (MRV) systems
- Policies, plans and regulations
- Knowledge, skills and capacities

The precise role that the CRGE strategic outcome map plays within each sector varies and the relevance of the specific projects and programmes within each is explored more fully in the following sections of the evaluation report. The overall CRGE strategic outcome map is shown in Figure 3.

Figure 3 CRGE strategic outcome map



Source: Government of the Federal Democratic Republic of Ethiopia. 2015. CRGE Facility Monitoring and Evaluation System Manual.

3.3 Delivering climate finance

Ethiopia has implemented several **readiness activities** to fulfil the requirements of international climate funds, particularly the AF and the GCF. In fact, Ethiopia was already implementing climate initiatives in natural resource management and the renewable energy sector prior to the development of the CRGE Strategy. In 2011 alone, about 14.5 percent of the national budget was used for interventions that had climate adaptation and mitigation relevance.[12]

The CRGE Facility has been the main driver behind the mainstreaming of the CRGE Strategy into the overarching national development plan (GTP II), as well as the MoF's accreditation by the GCF and the AF. Given the MoF's role in managing the national budget, the involvement of MoF was particularly important in mobilising climate finance from bilateral and multilateral development partners. Between 2014 and 2015, the CRGE Facility received over US$ 40 million of initial funding from the United Kingdom, Norway, Denmark, and Austria. These funds were used towards promising priority sector climate projects or programmes under CRGE Facility's FTI process.

The **FTI process** was designed to operationalise the implementation of the CRGE Strategy in priority sectors. FTI projects allowed the testing the CRGE Facility's processes and systems to provide rapid and iterative feedback for implementation modalities on the ground.

In parallel with the implementation of the FTI projects, the **United Nations Development Programme (UNDP) supported the operationalisation of the CRGE Facility** with over US$ 1.2 million in funding for human resources[13] and undertaking capacity building and training activities. UNDP also provided support in the development of the CRGE Facility's Operational Manual and the M&E System Manual, which were the critical requirements for donors in order to channel funds through the CRGE Facility.[14] Complementing the UNDP, the **GGGI has been providing additional support** to the CRGE Facility for improving project cycle management (PCM) and reviewing and evaluating FTI project proposals prepared by CRGE sectors.

Support from both the UNDP and GGGI played a critical role in supporting the CRGE Facility to develop the strategic frameworks and systems necessary to meet the GCF's and AF's accreditation criteria. The CRGE Facility through the MoF got accredited by the Adaptation Fund in 2016 and GCF in 2017, allowing Ethiopia to directly access funds and manage projects with the size of up to US$ 10 million and US$ 50 million respectively.

Subsequent to its accreditation, the CRGE Facility with Technical Assistance (TA) support from DFID (now FCDO), the Climate and Development Knowledge Network (CDKN), GGGI and the UNDP developed proposals for bankable projects that were approved for funding by the AF and GCF.

Since its inception, the CRGE Facility has secured over US$ 190 million from bilateral development partners, multilateral climate funds under the UNFCCC, including the AF and GCF, and GoE co-financing (Table 3).

FTI projects account for about one-tenth of the overall funding channelled through the CRGE Facility since 2013.

Box 2: Climate investments by non-state actors

Complementing bilateral, multilateral, and GoE funding, a new law on civil society organizations (CSOs) in 2019 has resulted in increased investments by non-state actors towards climate change. According to a study commissioned by the UNDP, climate finance mobilised by non-state actors towards climate related activities in Ethiopia increased from about US$ 4.7 million in 2012 to over US$ 38 million in 2018. This trend is expected to continue.

[12] Zewdu Eshetu, Belay Simane, Gebeyehu Tebeje, Workneh Nigatu, Aklilu Amsalu, Abeje Berhanu, Neil Bird, Bryn Welham and Nella Canales Trujillo (2014). Climate finance in Ethiopia, ODI, London and Climate Science Centre, Addis Ababa.

[13] UNDP funds were used to recruit the CRGE Project Coordinator, ESMF and Safe Guard Expert, M&E Expert, and Finance Head.

[14] The UNDP Multi-Partner Trust Fund Office (MPTF Office) also serves as the provisional Trustee for the CRGE Facility, providing fund administration services for funding that is channelled through the CRGE Facility's International Account.

Table 2 CRGE Facility funding

Type of source	Country	Year of Approval	Amount in US$ (million)	Purpose of funding
Bilateral	UK	2012	25.00	CRGE Facility support; Fast Track Investments
	Austria	2012	0.83	CRGE Facility support; Fast Track Investments
	Norway	2013	16.00	Mitigation and adaptation, including renewable energy in rural areas, reduced deforestation and land management
	Denmark	2015	4.60	Green agricultural transformation, focused on smallholder farmers
Multilateral	REDD+	2016	80.00	Enhancement of forest carbon stocks
	AF	2017	9.90	Increase rural resilience in seven agro-ecological landscapes through an integrated water, agriculture and natural resource management approach
	GCF	2017	50.00	Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities
	World Bank		1.50	Developing a multi-sector investment plan to scale up achievement of goals related to resilient low carbon green growth
Government of Ethiopia		2017	5.00	Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities
Total			192.83	
Allocated to FTI projects			18.63 (9.6 percent)	

Sources: CRGE Facility and Project MoUs

Over the years the CRGE Facility has supported and incentivised the adoption of a more programmatic approach to climate change activities in order minimise transaction costs and duplication associated with the original sectoral approach of the CRGE strategy. Recent projects have a programmatic foundation in their setup and address climate change in a more holistic and integrated manner. This marks a considerable shift from the sectoral approach the CRGE Facility had adopted in the FTI projects.

The **learning curve has been significant since the implementation of the FTI projects**. Interviews with a wide range of stakeholders as part of this evaluation have indicated that the CRGE Facility has been responsive to quickly adapt and strengthen its systems and processes to ensure efficiency and effectiveness of project and programme identification, design and delivery processes. Excluding investments made directly by the GoE, the CRGE Facility has administered over US$ 190 million investments including funding from the GCF and AF, which have strict reporting requirements.

Ethiopia's experience has shown that much can be accomplished when there is real commitment towards climate action. Box 3 lists key achievements since CRGE Facility's operationalisation in 2013.

Box 3: CRGE Facility achievements since it was operationalised in 2013

- Made significant contribution to the mainstreaming of the CRGE Strategy into the second Growth and Transformation Plan (GTP-II) (2016-2020)
- Successfully implemented 27 adaptation and mitigation projects valued over US$ 20 million in total across Ethiopia's regions and CRGE sectors through its FTI process
- Mobilized an additional US$ 80 million for REDD+ Investment Plan
- Set up the financial and program management and environment and social safeguards systems as well as Monitoring and Evaluation (M&E) framework that are required by international climate funds as part of their due diligence processes
- Spearheaded the accreditation of MoF for direct access to funds from the GCF and AF
- Mobilized US$ 10 million from AF for a climate smart integrated rural development project
- Mobilised US$ 50 million from the GCF to implement the program Responding to the increasing risk of drought: building gender-responsive resilience of the most vulnerable communities
- Developed a gender mainstreaming guideline and environment and social safeguards (ESS) framework
- Mobilised US$ 1.5 million from the World Bank-administered Pilot Program for Climate Resilience (PPCR) to lead the development of a Multi-Sector Investment Plan (MSIP)
- Developed Climate Finance Tracking and Projection Methodology
- Conducted a national CRGE capacity assessment and prepared a CRGE Capacity Development Framework Road Map to strengthen government capacities to operationalize the CRGE strategy, plan, mobilise resource and deliver green, climate resilient development results
- Implemented the GCF Readiness Project with GGGI as a delivery partner to building the capacity of the MoF in project or programme development and strengthening Ethiopia's engagement with the GCF
- Use established CRGE Facility manuals, fiduciary systems and reporting channels in implementing the US$ 60 million GCF and AF initiatives in close collaboration with CRGE sector ministries and the private sector
- Developed a private sector engagement strategy

Source: adapted from CRGE Facility documentation

3.4 Looking forward

Significant financial resources and sound investments are needed for Ethiopia to achieve its ambitious climate goals. While financial mobilisation and investments to date are making valuable contribution towards the implementation of the CRGE Strategy, they are not sufficient.

The MoF is currently seeking to upgrade its GCF accreditation scope. To this end, the MoF through the CRGE Facility has embarked on further articulating its institutional arrangements and building its fiduciary management capabilities for project and programme management, financial reporting, and environmental and social safeguards (ESS) systems and procedures. The CRGE Facility is also preparing multi-sectoral cross cutting pipeline projects to be submitted to the GCF upon accreditation upgrade of the MoF.

As a result of the CRGE Facility, **the MoF has incorporated climate change at the core of its planning and budgeting processes to promote national climate action**, especially through fiscal policy and the use of public finance. Against this background, the MoF is taking bold steps to ensure that the fiscal policy and use of the public finance are aligned with climate action. These are outlined below:

- First, the GoE is well underway in meeting most of the Helsinki Principles[15] through the CRGE Strategy and mainstreaming of climate change across all sectors. Specifically, the CRGE Facility is implementing a project within the Channel 1 Directorate at the Treasury Department to streamline climate tagging across all budgets prior to their release to the Sector Ministries. This would **enable the MoF and the CRGE Facility to track national budget expenditure on climate investments across the sectors to measure achievements towards meeting the CRGE Strategy and the NDC**. For instance, the Facility is currently actively engaged with the Channel 1 directorate in streamlining the US$ 500M World Bank Funded Climate Action through Landscape Management (CALM) program. This process will enable the CRGE Facility to evaluate its economic, environmental, social impacts on specific projects and programmes and use that knowledge to inform the identification, design and delivery of future projects.
- Second, of Ethiopia's 113 million hectares of landscape, 54 million hectares are severely degraded and require restoration. Restoration of degraded landscape not only captures carbon emitted thus propelling the country towards delivering its NDC, but also increases ground water recharge, increased agricultural productivity, import substitution thus building the rural and national economy. Against this back drop, **the CRGE Facility through the MoF spearheaded the initiative to allocate 0.5 percent of the annual federal budget towards regions to continue and implement the Green Legacy Initiative (GLI)**. Accordingly, the MoF has issued a directive to all regions to allocate a proportional matching fund to be allocated towards restoration of degraded landscape within their boundaries. The funds allocated to the regions is structured to follow **Results-Based Funding (RBF) modality** to ensure transparency and sustainability. The GLI initiative has brought about a snowballing effect outside of the government circles and transpired across the society in general actively advocating for a green future.
- Finally, the MoF periodically conducts a Public Expenditure and Financial Accountability (PEFA) assessment. The PEFA assessment is initiated by the European Commission, the International Monetary Fund (IMF), the World Bank, and the governments of France, Norway, Switzerland, and the UK. The assessment provides a framework for assessing and reporting on the strengths and weaknesses of public financial management (PFM) using quantitative indicators to measure performance. Through the CRGE Facility's drive, **the MoF has agreed to conduct a Climate Responsive Public Financial Management (PEFA Climate) assessment**, currently in pilot phase.

[15] The Helsinki Principles, established in Washington DC, USA, in 2019, on Finland's initiative, are designed to support Finance Ministers to share best practices and experiences on macro, fiscal, and public financial management policies for low-carbon and climate-resilient growth. The principles are as follows: (i) Align policies and practices with the Paris Agreement commitments; (ii) Share of experience and expertise with each other in order to provide mutual encouragement and promote collective understanding of policies and practices for climate action; (iii) Work towards measures that result in effective carbon pricing; (iv) Take climate change into account in macroeconomic policy, fiscal planning, budgeting, public investment management, and procurement practices; (v) Mobilise private sources of climate finance by facilitating investments and the development of a financial sector which supports climate mitigation and adaptation; (vi) Engage actively in the domestic preparation and implementation of NDCs submitted under the Paris Agreement.

4 The FTI portfolio

The evaluation conducted a **portfolio analysis** on the basis of available documentation and a compiled database of every FTI project shared by the CRGE Facility. The portfolio analysis highlights sectoral concentrations and provides a comprehensive overview of the FTI portfolio.

A total of 27 projects were financed through the CRGE facility's FTI funding modality. These projects were developed by six line ministries (CRGE sectors),[16] all aligned to the priorities of the CRGE Strategy. Table 4 provides a summary description of the purpose of FTI funding per CRGE sector.

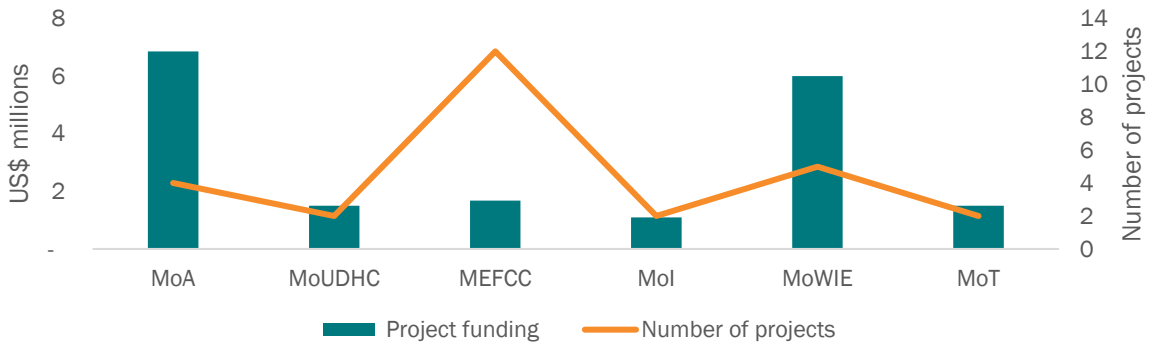
Table 4 Purpose of funding per CRGE sector

CRGE sector	Purpose of funding
Ministry of Agriculture (MoA)	Funding was allocated principally towards a large programme that piloted climate smart agriculture (CSA) approaches in 27 woredas across eight regions to promote improvements in agricultural productivity and per capita income, while reducing GHG emissions and vulnerability to climate change. A separate pilot project implemented integrated watershed development mechanisms to improve resilience to climate change and variability within the sensitive and fragile ecosystems of the Central Rift Valley (CRV). MoA funding was also allocated to develop internal M&E and MRV systems for agricultural sector investments.
Ministry of Urban Development and Construction (MoUDC)	Funding was allocated toward a portfolio of 16 projects grouped into two broad programmes, one promoting improved composting and solid waste management (SWM) and the other establishing and developing urban green spaces/parks. Projects took place across 13 cities. In three cities (Addis Ababa, Hawassa, Butajira) projects from both programmes were undertaken concurrently, in which case complementarity between the projects could be explored, for example through using the composted waste from the SWM projects for urban greening.
Environment, Forests and Climate Change Commission (EFCCC)	Funding was allocated to a portfolio of 12 projects, many of which focused on local-level landscape rehabilitation or promoting improved forest management. Two projects in Oromia specifically focused on developing sustainable techniques for managing the production and processing of bamboo to improve livelihoods.
Ministry of Water, Irrigation and Energy (MoWIE)	Funding was allocated to five projects, the largest promoting the use of solar energy in rural areas to support water supply and irrigation. MoWIE projects also supported climate and hydrological information systems at the national level and capacity building for the monitoring of petroleum downstream operations.
Ministry of Trade and Industry (MoTI)	Funding was allocated to two projects. The first designed a MRV system for measuring GHG emissions in five industrial sub-sectors (brewing, cement, tanning, textiles, and steel) and recommended energy efficiency measures. The second was a project aimed at demonstrating the benefits of greening industrial zones, and was piloted in the Bole Lemmi Industrial Park.
Ministry of Transport (MoT)	MoT funding was allocated to two projects in Addis Ababa. The first one developed walking and cycling facilities for urban transportation, with the aim to promote the usage of safe and environmentally friendly non-motorised modes of transport particularly for short distances. The second project developed off-street parking, aimed at improving traffic flow and in so doing reduce GHG emissions caused by congestion.

[16] In 2015, the Ethiopian Industrial Parks Development Corporation (IPDC) took responsibility of the green industrial zones project that was prepared by the MoTI.

Between 2014 and 2017, the period this evaluation covers, the CRGE Facility commissioned 27 FTI projects with a collective budget of US$ 18.63 million. Figure 1 presents the distribution of projects by implementing entity, number, and budget across the six CRGE sectors.

Figure 4: FTI project funding per CRGE sector



Note: The US$ 1.1 million funding allocation for MoI is the total figure for both MoI and IPDC. MoUDC projects are represented as two projects (urban greenery development and solid waste management) for clarity of presentation, but some CRGE documentation also presents the MoUDC FTIs as 16 distinct projects.

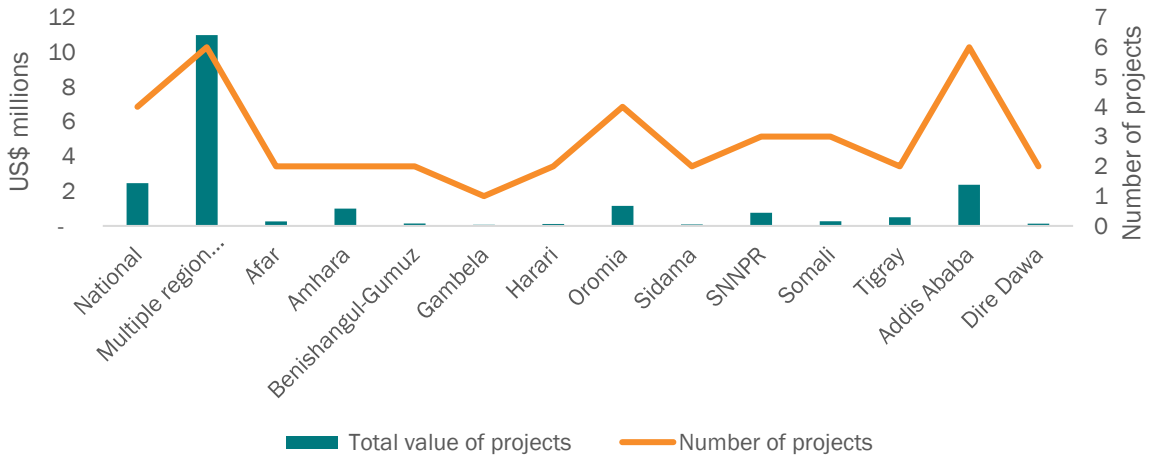
Source: Project MoUs

The MoA accounts for the largest portion of FTI resources in regard to allocated funding (about 37 percent), followed by MoWIE at 32 percent, EFCCC at 9 percent, MoUDHC at 8 percent and MoT at 8 percent. MoI (including IPDC) represents an allocation of 6

Projects implemented through the MoA and MoWIE therefore constitute over two thirds of the FTI budget. Within these allocations, MoA's project to pilot CRGE Strategy measures through agriculture sector climate proof and low carbon agricultural investments (US$ 5.2 million) and two of MoWIE's projects on disseminating solar energy technologies for water supply and agriculture (US$ 6.3 million combined) represent the majority of all FTI funding.

Figure 5 below presents the number of projects and budget by project location. Projects being implemented in multiple regions account for roughly 66 percent of the total FTI programme budget. Of the US$ 13.4 million that was allocated to support multi-region projects, the largest portion of funding comes from the MoA. Of projects targeting a single region, Addis Ababa has received the largest proportion of funding at US$ 2.4 million. Most of the spending in Addis Ababa was through the MoT, on projects supporting the reduction of GHG emissions through reducing traffic congestion.

Figure 5: FTI projects across regions and city administrations (number and value)

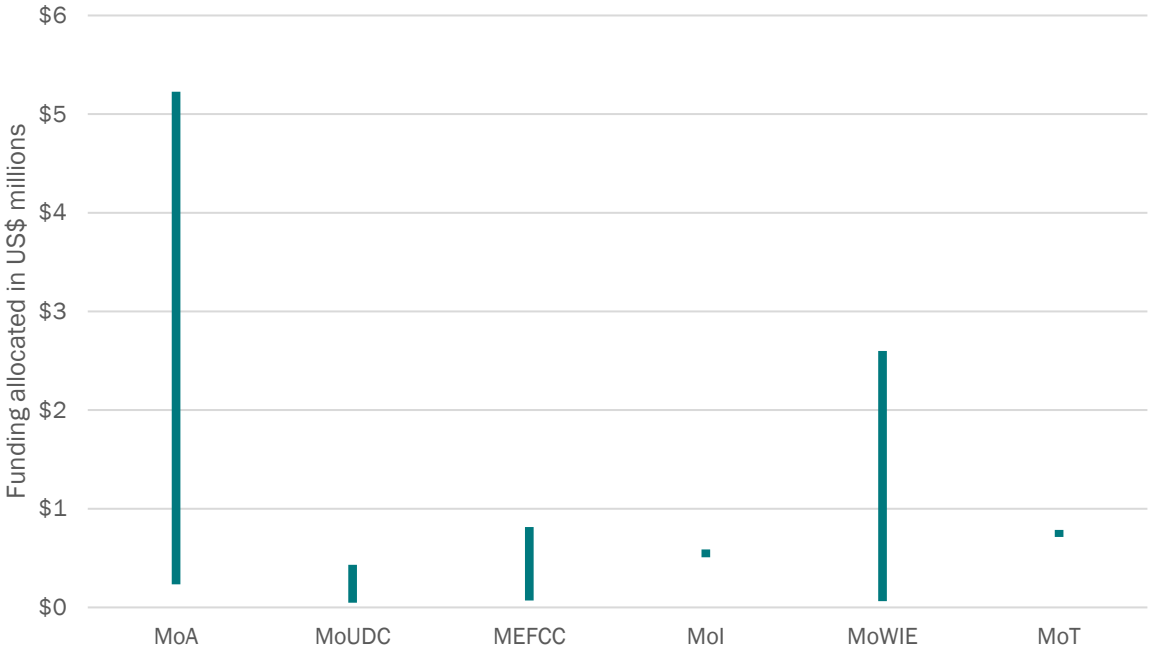


Note: Multiple region projects refer to those that had a combined budget to be implemented in more than one region.

Source: Data from project proposals and MoUs

This evaluation also calculates the **range and average of budget at FTI project level per CRGE sector**. As shown in Figure 6, the budget per project ranges significantly, particularly for MoA and MoWIE FTI projects.

Figure 6: FTI projects average and range costs



Source: Data compiled from the CRGE Facility's M&E consolidated report

MoA's budget was concentrated in large multi-region projects implementing a range of activities including improving livestock and crops productivity through low emitting techniques, agricultural value chain development and market access, watershed management and water harvesting, community mobilisation and developing institutional partnerships, capacity, and knowledge management. These programmes were managed centrally as singular projects, resulting in the high nominal project budgets, which may represent good value for money in reducing management overheads.

MoWIE's projects also show a wide range of values, and can be distinguished into two categories of interventions. Similarly to the MoA's projects, the larger MoWIE projects (above US$ 2 million) were multi-regional programmes aimed at promoting the use of solar power in a range of rural contexts, for water supply and irrigation as well as other livelihood activities. MoWIE's smaller projects were generally capacity development activities promoting national-level monitoring systems for hydrological management and petroleum supply.

EFCCC and MoUDC adopted a different approach to project management, dividing their allocation into nominally discrete projects. All but one of the smallest projects (under US$ 100,000) were undertaken by these two CRGE sectors, and focused on local-level forest management projects (EFCCC) and urban greening interventions (MoUDC).

There may be a trade-off between the approaches to project management among different CRGE sectors. Grouping interventions into single projects is likely to reduce overhead costs and promote consistency of reporting, while considering interventions as discrete projects is likely to promote local-level ownership, increase scrutiny and accountability, and incidentally promote capacity building in project management.

In general, accounting for different approaches to project management, despite the large apparent size of some FTI projects, **the portfolio can in general still be characterised as supporting smaller scale discrete interventions**.

5 Case studies

A strong feature of the final evaluation is the use of case studies. In a **representative subset of 9 FTI projects (one-third of the total), a more in-depth evaluative approach was employed** to identify success stories, lessons, and sustainability strategies. Evidence gathered through **consultations with a broad range of federal-, region- and woreda-level stakeholders** were used to inform the development of case studies and the overall findings and recommendations of the evaluation.

In the case studies the evaluation sought to investigate the validity of the reported results. While it was not always possible to definitively validate the reported results, the evaluation sought evidence on whether the reported results have been achieved and sustained with reasonable confidence. In practice, this meant probing key stakeholders about their perceptions of FTI's relative contributions to changes in enabling factors and the potential for those changes to contribute to outcomes and impacts. Documentation and data also provided evidentiary basis for evaluating reported results.

Using both portfolio and project level FTI data, and supplemented with information gathered through consultations with the CRGE Facility, nine FTI projects were selected as shown in Table 2. The selection ensures coverage across all CRGE sectors. **Annex 6** provides our sampling approach for case study selection.

Table 5: FTI projects selected for case study analysis

A/A	Project title	CRGE sector	Funding (US$)	Field visit information	
				Region	City or woreda
1	Piloting CRGE strategy measures through agriculture sector climate proof and low carbon agricultural investments	MoA	5,111,124	SNNPR	Dara
				Oromia	Akaki
				Amhara	Enbise Sar Midir
2	Solid waste composting in Hawassa City Administration	MUDC	47,728	SNNPR	Hawassa
3	Recreational Park Development for Adama City in Kebele 01	MUDC	108,572	Oromia	Adama
4	Mount Jemo Wechecha ecosystem Rehabilitation Project	EFCCC	159,982	Oromia	Sebeta
5	Establishing MRV system for selected industries, GHG baseline data and energy efficiency	MoTI	992,000	Addis Ababa	Addis Ababa
6	Solar power for water supply and irrigation	MoWIE	3,299,210	Oromia	Tulu Bolo
7	Strengthening the monitoring capacity of petroleum downstream operations	MoWIE	635,000	Addis Ababa	Addis Ababa
8	Strategic support for water monitoring systems	MoWIE	700,000	Addis Ababa	Addis Ababa
9	Off-street Parking as instrument to improve traffic flow and emission reduction in Addis Ababa city	MoT	780,000	Addis Ababa	Addis Ababa

PILOTING CRGE STRATEGY MEASURES THROUGH AGRICULTURE SECTOR CLIMATE PROOF AND LOW CARBON AGRICULTURAL INVESTMENTS

CRGE sector	Ministry of Agriculture (MoA)		
Regions	Amhara, Tigray, SNNPRS, Oromia, Gambella, Beni-Shangul, Afar, Somali, Harari, and the Dire Dawa City Administration		
Timeframe	04/2014-09/2016		
Budget (project spent)	US$ 5,111,124		
Beneficiaries	33,083	**GHG emission reduction (tCO_2)**	746,527 over 20 years
Rehabilitated land (Ha)	3,689	**Land cultivated utilising CSA practices (Ha)**	2,998

Highlights

- Ethiopia is particularly vulnerable to accelerated soil erosions because of existing pressures and land degradation.
- For the agriculture sector, the Green Economy Strategy proposes improving crop and livestock production practices for higher food security and farmer income while reducing emissions.
- The FTI project aimed at increasing incomes and food security while securing climate change adaptation and mitigation gains.
- The project was successful in increasing productivity, reducing emissions and land degradation, diversifying means of livelihood and income, increasing income and reducing risks through adoption of climate smart agriculture, crop diversification and mixed farming in all regions.

Context and background

Ethiopia is one of the most vulnerable countries in Africa to the impacts of climate change, with limited capacity to cope with shocks and adapt to trends. **The threats posed by climate change to the agriculture sector as more and more intense rainfalls and frequent droughts across Ethiopia include increasing soil erosion and damaging crops.** Ethiopia is particularly vulnerable to accelerated soil erosions because of existing pressures and land degradation: 79 percent of land has a slope of greater than 16 percent, with 25 percent having a slope of greater than 30 percent. There will also be changes in production system viability; cropland area and cropping patterns; pest and disease frequency and distribution brought by changes in seasonality; timing and distribution of rainfall; higher evapotranspiration; and drought and flood damage. Livestock yields will be impacted directly through temperature effects on annual growth, milk and wool production and reproduction; and indirectly by changes in the quantity and quality of pasture, forage, grass and disease and parasites. Moreover, severe droughts have led to frequent loss of crop and livestock, which in turn have often contributed to famine. Climate change aggravates this. It is a well-established fact that climate change causes significant reduction in rainfall and increase in droughts in some parts of Ethiopia. Droughts results in loss of human life, livestock, and property, as well as migration of people.

The agriculture sector has been identified in the CRGE Strategy as major source of GHG emissions and at the same time having high GHG emissions reduction potentials. For agriculture, the Green Economy Strategy proposes improving crop and livestock production practices for higher food security and farmer income while reducing emissions.

Overview of FTI project

The purpose of this FTI project was twofold, mirroring the twin goals of Ethiopia's CRGE Startegy: to simultaneously deliver rapid economic growth and ambitious climate change objectives. These

climate change objectives are themselves two-fold: adaptation (i.e., 'climate resilience') and mitigation (i.e., 'carbon neutral green economy'). Accordingly, the FTI project aimed at:

1. Increasing incomes and food security despite climate change; and,
2. Securing adaptation and mitigation gains.

There project consisted of three components:

1. Component I: Agriculture Sector CRGE FTI Implementation in 22 Woredas of 8 Regions
2. Component II: Technical Assistance and Capacity Building on M&E, MRV and Long-term Investment plan for Selected Agricultural Sector CRGE Fast Track Project Woredas
3. Component III: Piloting Agriculture CRGE in the Rift Valley Ecosystem (CCF-E)

Component I of the Agriculture Sector CRGE FTI project had 5 outputs, with multiple corresponding activities. These were:

1. Output 1: Capacity for institutions involved in the agriculture sector CRGE implementation strengthened at national, regional and woreda levels.
2. Output 2: Increased crop productivity through CSA practices that also contribute to GHG emission reductions.
3. Output 3: Increased productivity of livestock through CSA practices that also contribute to GHG emission reductions.
4. Output 4: Productive lands conserved and degraded lands rehabilitated through integrated NRM in pilot areas and contributed to sustainability and improved local livelihoods.
5. Output 5: Resilience of farming households to climate change in piloted woredas increased.

The evaluation team visited three sites. The pilot project at Bilbilo in Akaki Woreda, aimed at delivering only one of the five outputs, i.e., output 4: Productive lands conserved and degraded lands rehabilitated through integrated NRM in pilot areas and contributed to sustainability and improved local livelihoods. Activities under implemented under this output:

- **Restore land following watershed logic** (construction of appropriate physical and biological conservation measures; gully rehabilitation – biophysical measures and consequent management; and agricultural land management with all components as appropriate.
- **Implement afforestation/reforestation activities** (planting and post-planting management)
- **Rangeland management in pastoral areas** (bush clearing, removing and protecting invasive species, development of water harvesting schemes, enrichment planting for improved forage supply, flood protection)

The Kebele 033 site in Enbse Sarmider woreda of East Gojam and Dara Woreda of Sidama Regional state mainly implemented the first four outputs described above, with a number of activities under each output.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. The projects were designed to contribute to the national and sub-national overarching strategies and development plans like the CRGE's Green Economy Strategy and Resilience Strategies, as well as the GTP II. As outlined in the CRGE Strategy, agriculture and forestry are the sources of 87 percent GHG emissions in Ethiopia. In agriculture, the main sources of GHG emissions are livestock and crops, with the share 40 percent and 10 percent of the total emissions, respectively. Livestock emissions are arising from digestion processes and excretions, while crop emissions are mainly from use of fertilizer and crop residues. Similarly, the main sources of emission from the forest sector are deforestation for agricultural land (50 percent of all forestry-related emissions) and forest degradation due to fuelwood consumption (46 percent) as well as formal and informal logging.

The sector is highly vulnerable to the impacts of climate change, unless proper measures for resilience are put in place. Climate change will reduce agricultural production and output in sectors linked to agriculture and is likely to reduce GDP by about 10 percent. At the household level, climate change is likely to raise income inequalities, reduce household wealth and fuel poverty. Further, food production is expected to be consistently and negatively impacted and compound challenges of food security. Changes in rainfall will make critical problems at household level such as dates for preparing and planting more difficult. Large decreases in the productivity of major cereals have been projected. Coupled with small and decreasing farm sizes adaptation to future impacts will be challenging. Many species of plants and forest ecosystems will also be vulnerable to disease and fire, loose suitable areas, and further increase emissions and degradation.

To summarise, from the interviews conducted with key informants at different levels, the FTI project was seen as highly relevant to the local needs and priorities, and also well aligned with the national strategic and economic growth targets. They were all aligned with the national overarching strategies as mentioned above. Further, alignment with the priorities and needs were ensured through bottom-up, participatory projects design process.

Extent of ownership and leadership in development of investment plans and projects. Regional targeting was based on the principles of equity and relevance in addressing the prioritised issues. Project sites were selected in consultation with the regional experts. Beneficiaries were identified at local level through consultations of kebele management, development agents and elders. Interviews conducted with beneficiaries of the FTI project at local project sites level shows that the beneficiaries and sites were selected carefully, through discussions with the local community members, kebele officials, elders and development agents. The projects were jointly developed by the federal ministries, regional states and relevant NGO and private service providers that have executed the projects. Series of facilitated consultations were held to finalise the design of the project.

Besides fulfilling the criteria set for selection, the interest and will of participants is notable as all beneficiaries interviewed have confirmed that they have participated voluntarily.

For example, a beneficiary at Enebse Sar Mider, told the evaluation team how he was selected:

> *I was selected since I do not have enough income, I was not able to feed my family, all my children were not in schools. However, I was straggling to feed my family, I have 8 children who needs by support".*

Efficiency

Extend to which activities and outputs were delivered according to plan and budget. From the review of documents and discussions with key informants, the FTI project have used the allocated resources efficiently, since most of the budget was spent on direct programme costs. Most externally funded projects usually have a separate project coordination unit, with own staff employed by the projects. The FTI projects, however, were implemented by integrating the projects into the regular programme of the responsible sector ministries and executing entities, without additional administrative costs for staff and logistics. The project also utilised their allocated fund (over 99 percent allocated fund). The activities were implemented by executing agencies own staff at different levels and not specifically hired for the project. This has created strong greater ownership and responsibility, while reducing additional administrative cost, and hence greater efficiency. In our assessment, the quality of evidences on the ground is strong.

Aavailability of M&E reporting, including measurable indicators, processes for collecting data. The executing agencies at all levels used the GoE procurement and purchasing guidelines for all purchased goods and services. Financial management and reporting against the funds disbursed for the FTI projects followed the CRGE Facility manual.

Effectiveness

Extent to which FTI activities achieved the intended objectives. The project achieved its intended objectives. The project has improved the capacities of institutions at all levels. For instance, the capacity building training has benefited 947 regional, woreda and kebele level experts, 81 development agents, and 7,422 famers and households.

The project intervention has also increased productivity of crops. The crop production component focused on improving productivity through various climate smart agriculture (CSA) interventions. To achieve improvement in crop production, the activities undertaken included distribution of various drought resistance crops and input such as bio-fertilizers and green manure, trainings on crop rotation and intercropping and awareness raising on CSA practices as well as construction of water wells for farming. Through these interventions, about 2,998 hectares of land was covered by different CSA practices. Based on the baseline and post project assessment on the project areas, cropland productivity increased on average by 80 percent compared to pre-project assessment result. At the same time due to improvement in crop production an average income of a household increased by about 20 percent.

Similarly, productivity of livestock production has also increased, while reducing emissions. Livestock interventions focused on dissemination of poultry, goat, sheep and cattle, capacity building in livestock management practices and forage development among other actions. Based on the baseline assessment and post project evaluation, an average of 57 percent improvement in livestock fodder/forage development, and increase in animal value chain efficiency were reported. Promotion of lower emitting animals including climate smart technologies had also contributed to increase in household's income from livestock sector. A total of 6,527 farmers/pastoralist have benefitted, of which about 3,085 were female headed households.

Restored landscape and surrounding village in Akaki woreda

The NRM component of the project focused on rehabilitating degraded watershed through various activities. The rehabilitation of the watershed was expected to bring positive change to the community and increase access to water. Furthermore, collective action of natural resource management and related activities was to be one of the most important sources of cash income for communities of the watersheds. Implementation of this activity in the watershed also created a short-term job opportunity and increase income for households that participate in the communal community construction of pond, gabion check dam, hillside terracing, trenches, construction and stabilization of artificial waterways, construction and stabilization of cut-off drains and other different activities of watershed management.

About 3,689 hectares of degraded land was rehabilitated through integrated physical and biological conservation measures. The implementation of different Integrated Natural Resource Management (INRM) has contributed to soil erosion reduction; improved water retention capacity to recharge ground water and surface stream flow and other ecosystem services provision. As a result of conserving productive lands through various INRM activities production of crops were expected to increase, improving income of beneficiaries.

Success stories

In the Akaki Woreda site that evaluation team visited, the two most outstanding successes of the project area were restoration of the vegetation cover and gully stabilization, both of which have other co-benefits. The area is highly fragile and susceptible to soil erosion and land slide, as can be seen on areas outside of the restored area. Areas adjacent to the restored area are highly degraded, with very thin soil layer in some areas, and dominated by rock outcrops. In the restored site, there is significantly higher vegetation cover, and top soil. The soil and water conservation structures have stopped erosion. Most of the terraces are filled with soil, and plants have regenerated along the bunds. The check dams have also stabilised the gullies very well, and all these have contributed to improved ecosystem goods like provision of water and grasses. Needy members also extract some wood for construction with the permission and payment to the kebele administration.

Mr. Sida Degife is an elder in the area, who is also one of the guards. He describes the benefits of the intervention as follows:

> *'Many springs that we used during my childhood dried decades ago. Few springs that remained were providing water only for few months after the rainy season ends. Following restoration of the watershed, many of the dried springs are back. The springs are providing water for more months during the dry season'.*

Impacts

Estimates of the GHG emissions reduction were presented in the project completion report. The estimates were based on two years implementation and eighteen year of capitalisation period. The calculation took into account baseline, with and without project implementation situation.

The site in Akaki was bare ground with rock outcrops like the right-bottom part. The upper part with vegetation cover is the area restored by the project, while the lower right corner is an adjacent area outside of the project area, depicted here for comparison.

Based on the findings, the total emission reduction achieved by implementation of the agriculture FTI project was about 746,527 tCO2eq over twenty years. The result has the highest ER value of 147,883 tCO2eq over twenty years. The others regions in order of rank in GHG reduction were Tigray, Gambela, Amhara, Harari, Afar, Dire Dawa, SNNP, Benshangul Gumuz and Somali. The table below shows estimates of the emission reductions of the different agriculture sector FTI projects interventions by regional states and land use types.

Table 6: Administrative level emission reductions

A/A	Region	GHG ER (tCO2e)
1	Amhara	72,082.00
2	Tigray	144,141.00
3	SNNP	40,403.00
4	Oromia	147,883.00
5	Gambella	109,532.00
6	Benishangul Gumuz	30,344.00
7	Afar	59,093.00
8	Somali	25,139.00
9	Dire Dawa	46,124.00
10	Harari	71,786.00
	Total	**746,527.00**

Table 7: Land use / intervention types and emission reduction

A/A	Region	GHG ER (tCO2e)
1	NRM	554,328.00
2	Crop land	130,612.00
3	Land use change	38,259.00
4	Livestock and grassland	17,741.00
5	input and investment	5,587.00
	Total	**746,527.00**

Perceptions on impacts and the plausibility of sustained results by different stakeholders. The FTI project was successfully implemented and has achieved its intended objectives. The achievements during implementation and the evaluation team's observation of the sustained project results four years after completion are strong indicators of lasting impacts. By the end of the project implementation period, the project has achieved the following:

- Built the capacities 8,450 experts and farmers on climate smart agriculture
- Increased productivity: of crops by 80% and of livestock by 57%, benefiting over 6,500 farmers and pastoralist.
- Increased income of farmers: an increase of at least 20% on average;
- Restored close to 4,000 ha of degraded agricultural landscapes/ watersheds
- Projected to reduce 746,527 tCO2e GHG emissions from different agricultural land use types;

Generally, the perception of stakeholders both within the implementing institutions and the public in the project areas have improved in terms of recognising the need for responding to climate change. This include recognizing the importance of mainstreaming climate resilient and green economy objectives across their development activities for sustainability. Moreover, the FTIs have contributed a lot in terms of capacity development both technical and institutional and improving the culture of coordinated or harmonised planning and joint M&E of progresses.

Further, the FTIs have played great roles to learn about collaborative planning and implementation processes of the investment projects. The impacts included the shift from the project approach of the FTI projects to the Programmatic approach and mainstreaming of the CRGE objectives economy wide (both the CRGE Sectors and the social sectors) as well. From the projects that the evaluation team visited, these impacts are sustained and scaled up to other areas, using these as models, and improvising on the gaps identified from these pilot projects.

Gender impacts. The various components of the project intervention have brought diversification of income for households. Households who previously relied on one crop have now been able to grow vegetables as well as include livestock in their assets. Through this diversification, households have been able to build their asset and thus reduce their poverty level. Over the short period of time, income has also increased for households that have used drought resistant crop and also practice livestock growth. Increase in income is one of the indicators of poverty reduction. The intervention has also contributed to equity. For example, home garden vegetables and poultry were mainly managed by women, who also controls income from these.

Sustainability

Extent to which results and impacts of FTI projects have been sustained. The evaluation team visited three sites where the agriculture sector FTI projects were implemented: Akaki woreda in Oromia, Dara woreda in Sidama (former SNNP regional state) and Enebse Sarmider woreda in Amhara. The evaluation team observed that the project has achieved and sustained its results.

Gullies are restored and stabilised, and water is flowing from many springs at the lower parts of the hills for more months into the dry season. Local community members have also informed that many wild animals are back, which we have also confirmed from the droppings of different wild animals like hyena and porcupine.

The project achieved the intended objectives of restoring the degraded area and beyond. The increase in vegetation cover and associated environmental benefits have generated economic benefits as well, increasing availability of water for domestic use, availability of grass, decreased risks of landslide and soil erosion.

Photo: Improved availability grass for traditional houses roof thatching at Akaki site

Overall, during the evaluation team's visit at Bilbilo in Akaki woreda it can be observed that:

- The beneficiary communities have witnessed improved availability of water from spring over a longer period of time;
- Observed that gullies were stabilized, reducing degradation of agricultural land and stabilizing land productivity;
- Improved availability grass for traditional houses roof thatching (see photos above).

The interventions in Dara and Enebse Sarmider have focused on improving crop and livestock productivity, and have also achieved their objectives. The case of Ato Atenafe Belay from kebele 033 of Enebse Sarmedir is a good demonstration:

> *The project has provided him 25 chicken, 6 improved sheep breeds, 200 kg fertilizer and 50 kg improved wheat seed. The project also provided different trainings on CSA practices. The improved seed and fertilizer increased crop productivity to 15 quintals per ha. Honey yield has also increased to over 15 kg/hive/year. Our place did not have enough water for vegetation, so we never get honey all year long. Currently, the livelihood of the household is transformed significantly. He is producing his own natural fertilizer or manure, and has also continued using fertilizer and improved seed, chicken rearing. He has built a house in the town which worth 300,000-400,000 birr, sends his son to university.*

Extent of active participation and support of projects by stakeholders at all levels. The project benefited from effective coordination and communication at different levels. This is vivid even today. During our field visit for the evaluation, the sector focal points have facilitated and accompanied the team. Though the project was ended in 2017, the sector focal point at regional, zonal and woreda levels are still following up conservation activities on the ground, hiring guards, and providing technical supports as needed. They are also communicating with the CRGE Facility and other stakeholders as needed. The Akaki site, for example, is being used as a model success story for restoration of degraded areas. Hence, many experience sharing visits are often made to the site for different stakeholders coming from other part of the woreda and other zones in the regional state.

Extent to which the project properly identified and managed risks. The project considered aspects of sustainability in their design and have implemented. Risks were appropriately identified and addressed. To ensure sustainability, the project:

- Ensured strong sector ownership, by integrating the projects into regular programs of the executing entities; and,
- Guaranteed community ownership through participation at local levels from planning to implementation, and institutionalizing community participation, and while securing rights to use and share benefits through establishment of CBOs

Extent of active participation and support by stakeholders at all levels. The project was implemented by woreda and regional staff who are employee of the bureaus and not specifically hired for the project. This has allowed a greater ownership of the project by the implementers and also provided a mechanism to mainstream CRGE priorities into regular planning and implementation. The integration of CRGE into GTP has allowed experts to look at CRGE as part of their regular task rather than an additional project and helps to provide sustainability and continuity.

At site level, we have observed the woreda office of agriculture has hired guards to protect restored watershed, even four years after the project has ended. This shows strong support and commitment of the government as demonstrated by continued technical support, follow up and employment of guards for surveillance. The local communities are also happy with success of restoring the landscape and additional societal benefits.

Lessons learned

The project generated many lessons that can be used in scaling up similar interventions in the future. Some of these lessons have already been adopted since the completion of the FTI project. Lessons include:

- **Integrated project planning, robust M&E systems and capacity building are crucial:** The integration or coordination can be institutional (horizontal coordination) among the implementing sectors to avoid duplication of efforts, enhance synergy for better impacts, and contribute to learning. The FTI project employed a project and sectoral approach from in its design and implementation. This had limitations in terms of delivering better impacts and coordination among the projects and implementing institutions.
- **Financial management.** The financial management approach adopted under the FTIs (Channel Two) was not as not strong and the Facility learnt to shift to Channel 1 approach in the subsequent programmes and initiatives.
- **Project ownership:** Implementing of projects by executing entities' own staff increased ownership and programming/planning capacity. At the same time, however, it has created a heavy workload and burden for staff members of the implementing organisation.
- **Community awareness:** Creating responsibility and sense of ownership among community members through formal and informal meeting, provision of training and awareness campaigns is crucial to realize all conservation activities as well as to ensure sustainability.
- **Maintenance:** Physical soil and water conservation structures not only reduce runoff speed but also protect areas by restricting movement of domestic animals. Over time, these structures will need maintenance.

SOLID WASTE COMPOSTING IN HAWASSA CITY ADMINISTRATION

CRGE sector	Ministry of Urban Development and construction (MoUDC)
Regions	SNNPR
Timeframe	04/2014-09/2016
Budget (project spent)	US$ 47,728.63
Beneficiaries	193

Highlights

- Proper solid waste management, including landfill gas management and composting and recycling can be a major lever for GHG emission reductions.
- The project constructed a functioning compost site for Hawassa and its outputs have successfully been used to improve the city's greenery.
- The composting technique was innovative, requiring original research on the part of the municipality and fostering new technical knowledge.
- The project site has been visited by several other municipalities and stakeholders and is widely seen as a benchmark for best practice.
- Scaling up of the project would require improvement of the municipal waste sorting process, in order to provide organic inputs in the volume necessary to produce at scale and at the quality required for agricultural use.
- Co-financing from the municipality maximised outcomes and led to sense of ownership which drove the development of the site and local greening agenda beyond the lifetime of the FTI funding.

Context and background

As a result of the fast-growing urban population of Hawassa, there is large amount of solid waste being produced, about 110,605.4 kg per day, of which a large proportion is organic. This waste is not properly managed and because of this the environmental contamination has increased with negative impact on soil, water and air. This in turn contributes to the spread of contagious diseases like flu, diarrhoea, trachoma, typhoid. Organic waste has the potential to be recycled to compost, which in agricultural use would also reduce the amount of inorganic fertilizer.[17] The Hawassa City Administration believes that this demand for compost can also be fostered through awareness and workshops programmes.

The MoUDC designated different federal and regional offices for implementation of the project, using existing government structures, with MoUDC retaining overall responsibility for oversight in accordance with its federal mandate. In Hawassa, the city municipality was the main actor and co-ordinator managing the project, planning, implementation, and M&E, as well as providing technical support and capacity building to the operating SME undertaking the running of the compost facility after the project.

[17] FTI Project Proposal. CRGE Facility.

Overview of FTI project

The MoUDC prioritised projects that will contribute to the reduction of the amount of GHG emission targets, impacts on poverty reduction, food security, employment generation, gender equity and the inclusion of the disadvantaged community members, while planning and preparing the projects.

The intended objectives of the project include improved environmental quality through proper management of organic solid waste and converting to compost, sustainable environmental pollution control by practicing efficient waste management (of organic waste), and economic benefits through job creation and realising economic value for the municipality from compost, as well as contributing to the saving of foreign currency by reducing the cost of importing chemical fertilizer.

Anticipated project impacts also included increase of agricultural production and incomes of vegetable growers and farmers in the surrounding areas.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. The sector GTP I set a target to construct 358 landfills and improving collection coverage to effectively utilise the landfills and improve the sanitation of cities in the country. Moreover, the sector also set a target for the construction of 50 compost centres during the GTP period. In the CRGE Strategy, the urban sector also identified establishing proper solid waste management systems (including landfill gas management, composting and recycling) as a major lever for GHG emission reduction.

The project is in line with some of the key enablers identified in the subsequently elaborated CRGE M&E Manual System, making limited local contributions to (1) the degree of integration/ mainstreaming of climate change in national and sector planning and coordination, and (2) extent to which sectors use improved tools, instruments, strategies and activities to respond to climate variability and climate change.

The selection of the intervention was the result of a detailed assessment of priorities and needs, in relation to effective means of reducing GHG emission. An interview with a Hawassa City Administration official indicated that in their studies on the major causes of GHG emission in Hawassa, solid waste management was identified the most crucial one due to high value of methane. Based on this finding the municipality made preparations for a compost site in order to manage the solid waste and decrease methane. The official also noted that their study addressed urban greenery problems and ensured that the compost site planning was integrated with the urban greenery initiative, so that the greenery projects can source compost only from the solid management unit.

Extent to which safeguards and inclusion were considered in the design and implementation of activities. According to the government officials, the municipality also had a plan to conduct a full Environmental Impact Assessment (ESIA) for this intervention but found it only necessary to produce an EIA Plan and limited contextual assessment. Through this it was found that the composting would not affect the surrounding area, and that environmental effects were expected to be minimal. This can be considered appropriate level of mitigation, given the small scale of the project.

It seems that activities to ensure gender equity in project outcomes were not extensively considered and integrated into the project design and activities, but it should also be noted that this was not explicitly asked for in the proposal form (only a description of expected benefits by gender).

Extent of ownership and leadership in development of investment plans and projects. The project intervention represents a convergence of municipal and ministry/sector level priorities, with the implementing partners interviewed all understanding the project in terms of both national and local priorities.

To some extent the design of the FTI project (and particularly budget allocation) appears to have been initiated from the ministry. It is clear from the Decision Note that the CRGE facility was in favour of amalgamating all of the MoUDC SWM projects into a single programme, although this did not happen. This may have been positive, as it is clear that as a semi-standalone project it **retained a strong sense of local ownership, with the city administration buying in through providing necessary additional finances**. This co-financing also helped institutionalise urban greening in municipal budgeting and

planning. As noted, during project implementation the municipality was pro-active in noticing that the compost site was facing market problems at the beginning, with the municipality's Urban Greenery Department creating a market for the compost facility through integrating it with SMEs working in greenery projects in the city.

The activities and aims of the project are clear in the proposal documents, although sustainability was not fully integrated into the project plans. The Decision Note for the MoUDC proposals also highlights this project in particular as having failed to consider risks fully. Only three risks are listed: technical staff turnover, alien species and fire.[18]

There appear to have been some changes in institutional arrangements and involvement of stakeholders since design stage. The project proposal states a greater role than has been reported for the Regional Trade, Investment and Urban Development Bureau (RTIAUDB), as well as the Agriculture and Rural Development Office and Omo-micro-finance (for capitalising the operators), in practice their input to project management appears to have been minimal and the implementation was strongly identified and owned by the municipality. For the Agriculture and Rural Development Office, this can also be explained by the issue around quality of the compost for agricultural use (see Impact section). Hawassa University has, however, had useful involvement, through an assessment of the effectiveness of the compost in an iterative process (formally in connection to the parallel Urban Greening project).

Efficiency

Extent to which activities and outputs were delivered according to plan and budget: The principal outputs planned were to build one compost site, to train 120 compost performers and stakeholders and to conduct awareness raising of the pilot projects and potential for scale. These project outputs were largely achieved.

During the launch of the project, awareness creation for 40 participants and stakeholders was undertaken. Training was subsequently provided on SWM and theoretical and practical training on compost management and handling took place in two rounds for 20 from surrounding farming communities and 25 from urban households, 75 from SMEs, the rest regional and city experts and officials in the project areas. The project constructed a compost-shed with all necessary components (compost production shade, warehouse, and office and guard house). Quarterly monitoring and reporting were carried out.

Despite some inefficacies, which are outlined below, the project broadly accomplished these outputs within the lifetime of the FTI grant. The FTI quarterly report for September 2016 noted:

> *Completed sub-structure works including concrete and masonry work, super-structure: roofing, metal work, plastering and painting. Capacity building training was provided for 144 persons including operators, experts, waste generators and compost users in Hawassa.*

There were however some challenges to efficient achievement of output-level activities, which were overcome:

Officials from the municipality stated that the major problem in implementation of the project was shortage of funds. This was a problem of the size of the budget, rather than speed of disbursement. The insufficiency of the budget was attributed to the way in which the proposals were formulated, with MoUDC stipulating the project budgets without reference to context.

This issue was overcome through supplementary financing provided by the municipality, which enabled the principal output of the construction of the composting shed and facility (representing 75.2 percent of the initial project budget) as well as training of site staff and awareness-raising activities within the municipality - evidence from the final report clearly shows that a functional composting shed and process was in place by the time of the project end.[19]

[18] FTI Project Decision Note.

[19] FTI Project Final Report.

Photo by Abel Abera.

There were also inefficiencies in the composting process itself that became clear as the site became operational towards the end of the project, with the process being unexpectedly labour-intensive. This threatened the long-term efficiency of ongoing project outcomes and impact, but was in part overcome after the period of FTI funding closed, through leveraging finance from UN-Habitat for machinery (a tractor) to churn and remove the compost. Another source of inefficiency at the early stages of the project was the lack of necessary water (and budgeting for this). This was however dealt with through installation of a pipe, although the large volume of water required represents an ongoing cost not originally anticipated.

A retrospective inefficiency in use of resources may have been the training and awareness-raising of farmers. The project's final report states that 20 farmers were trained on how to utilise the compost. Given the perceived unsuitability of the compost for agricultural use (see Impact section) this may have not been the most efficient use of resources, although some interaction with farmers was presumably necessary for the project to learn about the limited marketability of the compost product. Reporting is elsewhere quite vague on the identity of the recipients of the awareness-raising training, although it is evident from our interviews that over time many in the municipality administration have become aware of the pilot project. The training of SMEs to undertake the composting work (and greening) was evidently successful.

Overall, evidence is limited with regards to efficiency, with detailed formal activity and output-level reporting being poor. LTS's VfM report provide some indications of inefficiency in project management, with this project being highlighted as one in which "management costs such as staff, office rent, per diems/entertainment and transport exceeded 30 percent of the total [budget spend]".[20] This could however be less problematic in the larger picture if the municipal co-financing was allocated to direct spend on materials etc., FTI funding may have absorbed some of the management overheads of this wider programme of work.

Effectiveness

Extent to which FTI activities achieved the intended objectives. The project proposal listed the intended outcomes as the production of cheap organic fertiliser and economic benefits to participants and the wider community. This was intended to support higher level impacts of contributing to a clean, healthy and sustainable environment and the reduction of GHG emissions. The project partially achieved these outcomes. The site is functioning and has brought some germinal economic benefits, but the expected agricultural-grade compost is not yet being produced for sale.

Challenges to effectiveness. The city administration municipal office, operators and SWM stakeholders stated that one of the principal challenges was a lack of technical knowledge regarding the composting process. The project showed effectiveness in adapting its approach, through researching the necessary technical literature and learning through experience. Given the pilot nature of the project and lack of such knowledge country-wide, this is an impressive achievement, evidenced by the numerous visits of other municipalities to learn lessons. The project also showed resourceful adaptation to the problem of assessing the quality of compost. Optimally, the compost would be assessed and graded through chemical analysis (see Impact section), but in lieu of this, students from the University of Hawassa have been involved in assessing the fertility of the compost through observation its efficacy in greening projects, contributing to an iterative process of improving its quality.

[20] CHIP / LTS International VfM Report.

Another principal barrier to the immediate viability of the project after the FTI grant period was the lack of a market for the compost while the product was in the process of improvement. The site manager noted that there were no customers for the initial product This market problem was overcome to a great extent **by extending the market linkages with the concurrent (part FTI/MoUDC-funded) greening projects in Hawassa**, through introduction to the MSEs/associations managing this Representatives of the municipality note that this created a vital market for the composts, **catalysing further funding and development of the site**.

Although agricultural-grade compost, and subsequently an expanded market, has still not been achieved, other public and private sector sources of demand have subsequently been developed to use the compost for greening purposes, such as Hawassa University, Hawassa industrial park, and religious institutions.

Institutional support. Notwithstanding the budget problems, project representatives reported receiving good general support from CRGE and MoUDC in complying with grant requirements, as well as timely help with co-financing. However, at the sector-wide level, a contemporary M&E visit (to the MoUDC's office in Addis Ababa) and the MUDC final report for the FTIs present a more challenging picture at the higher level of management of the grants. The M&E visit report notes:

> *[…] long delays at the federal ministry level in coordinating and facilitating reports from the line cities and towns and sending budget requests to MoFED for subsequent quarters. There was a key blockage in the system in the MoUDHC finance office. Responsible ministers and high level officials at the Federal level must own and commit to delivering these projects. They must follow up on progress and provide guidance where needed, and in particular in this case in the finance office. There are high communication gaps between the federal ministry and the project office.*

The MUDC general final report notes these delays and gives further context of:

- Lack of permanent staff and structure for CRGE works and FTI projects at all levels;
- Engagement of experts in other urgent works/focus on CIP tasks;
- Lack of appropriate on time trainings (how to use the CRGE Operational Manual, overall financial management for financial experts at federal and regional implementing entities, etc);
- Acute gap in financial management and reporting;
- Inadequate man power at all levels;
- Lack of appropriate training and clarity to apply IBEX software system for financial performance registration and reporting;
- Lack of trained financial experts at city and/or project level

The report also states however as a factor a lack of permanent focal person in some cities/towns or change of due to various reasons. This appears not to have been the case for the Hawassa project, however, which appears in context to have been significantly more efficiently managed in comparison to other MoUDC projects in the FTI portfolio. A lack of detailed contemporary reporting however makes this difficult to assess in detail.

Impacts

Most identifiable impact of FTI project. The project has achieved some environmental impacts, although since this has been achieved through providing material for urban greening, these impacts might more formally be attributed to the sister FTI greening project in Hawassa. Data for how much compost has been provided to this project (and other buyers) is not however available. Nonetheless, the project can be considered as contributing to the following impacts:

1 **Total advanced waste disposal (volume/year) for Solid waste.** A significant amount of the city waste is directly taken to the compost site, although the evaluation team have not accessed reporting on proportion and volume.

2 **Total national GHG emission savings (MT) / CO2-e emissions per US dollar of GDP (kg / US$).** This can be assumed to have taken place at small scale, through the use of compost in greening projects (and avoidance of more carbon-intensive inputs such as imported chemical fertiliser); the reduction of unused solid waste (and burning) can also be assumed to contribute. Again, it has not been possible to quantify this precisely.

3 **Cleaner urban environment.** The compost site has contributed to wider the municipal system for waste collection, as well as enabling urban greening projects.

Beyond direct environmental impacts, the principal impact of the project, as a pilot, can be seen in awareness raising and in demonstrating to multiple cities the feasibility of composting, and its potential to be economically generative. Overall, this is a significant achievement, and seems to be first of a kind in Ethiopian municipalities.

Within the municipality, the greenery office team lead told us that:

> *The project is eye-opening regarding potential (and what next steps need to be). It is a backbone example for climate initiatives, and awareness raising in municipal administration. Those who have learnt from example include Hawassa University, Industrial parks, private households, and hotels making their own compost.*

There is also evidence of small-scale impact on employment. The CRGE focal person informed us that the compost site currently has 50 employees at peak time, with 30 being permanent. The project attempted to ensure gender equity in access to these jobs, including leadership roles, although this was cited as a challenge by interviewees, with approximately 25 percent of the employees being women.

Barriers to large-scale impact. The main pathway to large-scale impact stated in proposal, that is the production and sale of compost for agricultural use has not been achieved. Production of compost at this assured quality would have potential for environmental impacts beyond the physical limits of urban greening projects, as well as providing an incentive for greater collection of organic waste, and provide a clear route to scaling-up through public or private sector replication.

The major remaining obstacles to this impact, s Stated in interviews with administration officials and operators are:

1 **Lack of pre-sorting of solid waste inputs (into organic and non-organic).** This was reported as the major bottle-neck for production, and without these toxic pollutants are introduced. It is labour intensive and not feasible to perform the sorting at scale at the municipal waste site, and so this sorting would (a) need to start at household level (accompanied by awareness raising activities), and (b) require a more sophisticated collection infrastructure keeping organic and non-organic waste separate (this could involve micro-enterprises). Officials also noted that transferral units at sub-city level would be necessary, and there is also a general shortage of waste bins and trucks in the municipality.

2 **Lack of local or national standards and agency to grade compost.** This was cited as essential for take-up for agricultural use, as farmers would require assurance that the compost is of high fertility and free of toxic pollutants and other impurity. This is also of crucial importance to avoid negative health and environmental impacts from toxic materials entering the food chain.

3 **Cost of production / price of compost**. The compost facility is currently subsidised and its product temporarily sold at a low price of 4.5 ETB/kg (below the cost of production) in order to stimulate the development of a market. The operator intends to raise the price when feasible to 10 ETB/kg, in order to improve financial sustainability. However, it was reported by operators that the local office of the Environment and Forest Agency (who would be a key early customer providing the demand necessary for scaling up) is not willing to buy the compost even at these low prices. It is clear that it is necessary for the cost of production to be reduced, e.g., through economies of scale, further mechanisation, and the municipality undertaking the sorting of the organic waste inputs.

4 **Outreach and demonstration in rural communities** would also be necessary for take-up for agricultural use.

5 **Capacity of the operator** and site would also need scaling up (see Sustainability section).

Sustainability

The project results have been sustained and developed following the lifetime of the FTI grant. The composting shed is functional, and producing compost for sale (albeit at an artificially low, subsidised price). The site has been developed since, partly through municipal funding and partly through funding for machinery and a larger shed from the UNDP's Nationally Appropriate Mitigation Action (NAMA) programme.

To summarise, field visit observations indicate:

- The composting facility is functional, the projects has built one compost shed, an office and guard room.
- The compost is mainly sold to greenery projects, and SMEs working on greenery projects collects composts four times a year.
- The waste management of which the facility is part lacks a solid waste sorting function to separate organic and inorganic waste, which currently make the compost produced very vulnerable to contamination.
- Site operators reported that the quality of the compost is sufficient for non-agricultural uses (e.g., urban greening projects), but due to a perception of potential contamination and lack of assurance of quality (e.g., through chemical analysis) it has not been marketable for agricultural use.
- The site's water infrastructure is not developed; transporting water from the lake is expensive due to the transporting fee.

Success story

The principal success story of the project is its demonstrative proof of concept that economic value can be derived from organic waste. The composting site forms one successful piece of a wider programme that would be necessary to scale and sustainability. The others being (1) improved waste sorting at municipal scale; and (2) the creation of a nationwide or local accreditation body to certify the quality of compost.

> *We have learnt that "WASTE CAN CHANGE TO WEALTH ". We learned a great lesson while doing the work. Now we have the knowledge on how make a quality compost, and what it takes for that.*

It was acknowledged by the municipality that activities to ensure sustainability were not fully incorporated into the workplan and budget (which was principally for material costs and training). However, the sustainability of the project was greatly reinforced by additional funding. This also fostered a **sense of ownership in the municipality which drove the development of the site and local greening agenda beyond the lifetime of the FTI funding**. On the other hand, the activities around awareness-raising within different departments of the municipality demonstrate early consideration of the importance of this buy-in for the longer-term sustainability of the project. Relying on leveraging additional funding through awareness-raising can represent risky strategy for sustainability, but this has proved largely successful in this case.

Potential for scaling and replication. The problem of the quality of organic inputs (see Impact section above) is acknowledged among officials and plans are in place to address this. There is currently a pilot scheme being enacted to improve household sorting of waste. There had also been a plan to build a sorting facility in eight sub cities but because of a shortage of finance it has not been fully implemented.

According to the municipality, there are some specific identified needs for scale-up within the site itself: a bigger/additional shed(s), machinery, and vehicles to transfer appropriate organic inputs. The facility is also very in need of safety materials, and access to (cheaper) water and power.

As stated by stakeholder in the municipality, further funding was successfully leveraged through UNDP's NAMA programme, providing machinery that is now used at the site, and an additional larger shed. Other grantees under the NAMA programme implementing similar project have visited the site as a model example.

A municipal official interviewed suggested that greater awareness among private sector actors, and support to engage with own initiatives would be crucial to scaling up and replication. It is suggested that technical and financial support would be necessary, with a co-ordinating unit to maintain focus, and co-ordinate initiatives in response to implementation challenges. This was seen as a better and more sustainable long-term pathway to scale than a formal PPP initiative, for which frameworks are currently lacking - although officials said there was potential to explore this.

The project is widely known across other municipalities as a successful pilot project. Experience has been shared with counterparts visiting from the following municipalities, such as Dire Dawa, Adama, Shashamene, Bishoftu, Bahir Dar, Butajira and Yeka sub-city (Addis Ababa). It is however expected that the barriers to large scale impact and sustainability identified in this case would also apply to these municipalities. Municipalities which may have more developed collection and sorting systems for organic waste would have the most potential to achieve large-scale impact.

Lessons learned

Two key lessons from the project are highlighted:

- Sustainability needs to be considered in the design of project activities, and assumptions about impact (predicated in this case on the use of the compost for agriculture) needs to be interrogated and risks mitigated more thoroughly; and,
- The successful continued functioning and development of the facility is due to early awareness raising of relevant actors within the municipal administration, which took place at relatively low cost. This should be integrated into the design of similar pilot programming, especially when further development will be reliant on leveraging co-financing.

RECREATIONAL PARK DEVELOPMENT FOR ADAMA CITY

CRGE sector	Ministry of Urban Development and construction (MoUDC)		
Regions	Oromia		
Timeframe	04/2014-09/2016		
Budget (project spent)	US$ 108,572		
Rehabilitated land (Ha)	9	**Increase in urban green area per capita (m2/urban inhabitant)**	3.14

Highlights

- The microclimate of Adama city is characterised by high temperature and prevalent atmospheric dust, due in part to local environmental degradation and soil erosion. This has caused a major impact on city life, with an increase in the risk of floods and droughts and higher incidence of health problems.
- The FTI project has developed a park in Adama as part of a wider strategy to mitigate these effects and providing a catalyst and example for further urban greening. The project reactivated a pre-existing plan in the city, which had not been implemented due to a lack of funding and impetus in the greening agenda.
- The recreational park is considered a long-term work-in-progress, built on seven hectares of land with further active development of facilities such as a library, cafeteria, meeting hall and playground, and expected in time to be sustained in part through own revenue generation.
- The co-financing and long-term outlook adopted by the municipality has been very significant in ensuring the development and sustainability of the park beyond the period of FTI funding.

Context and background

In urban areas of Ethiopia climate change is having a major impact on city life through rising temperatures, an increase in the risk of floods and droughts, and associated health problems, exacerbated by an accelerating rate of urbanisation and lack of adequate planning for climate change mitigation. In Adama in particular, the expansion of the city has not balanced built-up areas and the retention of natural environment. This has made Adama a city without significant green areas and particularly parks. Deforestation on the surrounding ridges of the city has been taking place for several years, resulting in soil erosion and the formation of large gullies at the foot of the ridges and downstream; siltation occurs in the flatter parts of the city and in ditches. Inadequate vegetative cover of appropriate species on the surrounding ridges, particularly in the east, frequently causes the east-west blowing wind to create dust storms throughout the city during the dry season.

For these reasons Adama was selected among cities prioritised for FTI projects by the MoUDC, intended to contribute to the triple objectives of economic growth, greenhouse gas emission reduction and resilience to the adverse effects of climate change. These pilot projects are intended to demonstrate the feasibility of appropriate actions and provide lessons as climate change and sustainability considerations continue to be systematically integrated into Ethiopia's economic development planning, through development of Long-Term Strategic Plans (LTSPs) under with the GTP II planning process.

The implementation of the project used existing government structures, with MoUDC having overall implementation responsibility in accordance with its federal mandate. No new organisational structures were established at the federal or regional level except the assignment of focal persons. The Adama City administration played a role in advocacy, facilitation, coordination and through providing of crucial co-funding with Urban Sanitation and Greenery Development Directorate

specifically responsible for site-level planning, project implementation and monitoring and evaluation activities.

Overview of FTI project

The principal project objective was to reduce urban pollution and greenhouse gas emission through developing a recreational park and raising awareness of the potential for urban greening to contribute to urban resilience. In this regard establishing a park fit within a vision of developing and managing districts in an integrated manner, to create a favourable environment in Adama for residents and visitors, and to improve opportunities for investment, hosting of conferences, residential development and recreation in particular. Within the district, the park was expected to contribute to the prevention of land degradation, provide relief from the 'heat island effect' experienced in the Adama microclimate, as well as stimulating neighbourhood economic activity.

Key project activities included preparation seedlings of plant species (trees, shrubs, flowers and turf), design preparation for the intended site, seedling plantation and post care for plants to be planted, construction landscaping elements, and fencing of the periphery roasted Eucalyptus stakes connected with mesh wire.[21] The project also concurrently conducted awareness-raising activities among stakeholders within the municipality (both administrative and local residents), to increase buy-in and sustainability of the greening agenda.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. The project activated the development of a site that had been allocated for development as a park 15 years ago. Interviewees among the municipal administration noted that there had previously been widespread scepticism within local government that this development would happen, and that most assumed that the site would be reallocated to housing development. This catalytic activation of a pre-existing municipal agenda for greening, which was sustained after the project, was cited by the Cleaner City and Greening Bureau as the principal contribution of the project.

The project proposal clearly set out the context of environmental degradation and resulting 'dust bowl' effect and heating of the microclimate in Adama. The project clearly fits well within plans set out within the GTP, which had a target of greening and beautifying 3,275 hectares of urban areas throughout the country. The planned 16 Ha for the fully developed park constituting a contribution of 0.5 percent of the total.

Extent of ownership and leadership in development of investment plan and project. There was strong pre-existing will for the greening agenda among sectors and personnel within the city administration prior to the project. In 2005 a compensation fee was paid for the land, which was identified as suitable recreational park and included in the masterplan. In the intervening years strong determination from the Urban Sanitation and Greenery Development Directorateretained the land against pressures to convert its allocation to housing development. This provided a strong foundation of buy-in for FTI project, and co-financing from the city administration the park was also made available, both concurrently and after the project.

Consideration of gender, safeguards and inclusion in the design. Officials from the Urban Sanitation and Greenery Development Directorate stated that gender was integrated in the planning process of the project. There is however little evidence of gender consideration in the proposal, beyond a statement that most employees maintaining the park were likely to be women (in fact, at the time of the site observation, this did not seem to be the case). It is also not evident that safeguarding was a major consideration in the project design.

Efficiency

Extent to which activities and outputs were delivered according to plan and budget. The envisioned project activities were largely carried out and outputs partially achieved. In the proposal the entire 16 Ha of the allocated site was proposed for urban greenery development, while only 9 Ha were actually

[21] Project Proposal

developed in the lifetime of the project.[22] This however may represent a prudent allocation of funds as the result of an early decision in planning, and there remains a long-term plan to fully develop the remaining 9 Ha., through municipal funding. Project outputs such as the water line that was extended to the park lay the foundations for this expansion the implementing partner suggested. The overestimation of hectares that could be developed within budget does however highlight a need for more realistic costings at proposal design stage, as well as reflecting possible tendency to inflate projected outcomes and impacts and proposal stage.

From observation, the park also needs further development to reach the envisioned outputs, in particular through the installation of lighting. This is acknowledged by the park operator as a pressing need, in order to conduct maintenance as well as to attract more visitors. Other elements of the park which are currently under development, such as the meeting hall and the library, go beyond the original scope of the FTI grant.

Park cafeteria. Photograph by Abel Abera (evaluation team)

Other planned outputs around awareness raising were achieved during the project lifetime. There were 207 attendees (158 males and 49 females) at the initial awareness-raising workshop (against a target of 200), and 218 implementing actors (148 males & 70 females) were trained, against a target of 200.[23]

Availability of M&E reporting, including measurable indicators, processes for collecting data, and feedback processes to facilitate decision making and learning. There is a lack of available detailed financial or M&E reporting from the project. The Spot M&E report into management of MoUDC projects at the time, although not focused on the Adama project, reported a sector-wide issue of:

[22] MUDC Final Report

[23] MUDC final report

> *Long delays at the federal ministry level in coordinating and facilitating reports from the line cities and towns and sending budget requests to MoFED for subsequent quarters. There was a key blockage in the system in the MoUDHC finance office'.[24]). It seems however that these problems did not affect the Adama project, with the head of the department stating that 'the money was released at once, and we integrated it with our GTP plan which made the project a long term [programme].*

With buy-in from the administration and co-financing available, the project could continue without being constrained by the FTI budget or issues of timing. There is also no evidence that an issue of ownership common to other MUDC projects, of implementing agencies disputing whether they had a mandate to implement the project[25], occurred with this project.

The VfM Report compiled in August 2016 by BTM Consultants / LTS reported no financial anomalies or causes for concern with regards to this project. The analysis of expenditure reveals that of ETB 2,163,034 spent, 70 percent was on 'Construction, Services, Fees and Charges', 20 percent on Training, printing, advertisement, and 7 percent on 'Purchase of forestry inputs. This appears to be in line of what would be expected from the activity plan.

Evidence for detailed M&E reporting is poor. This appears to be common across the MoUDC projects, with the MUDC final report listing as challenges lack of appropriate on time trainings on how to use the CRGE Operational Manual, overall financial management for financial experts at federal and regional implementing entities.

Some improvement in capacity was however reported by the implementing partner:

> *We took training on the CRGE project document, and I trained the City Administration higher officials and the community about CRGE project documents and the Adama recreational park.*

The increased management capacity of the Cleaner City and Greening Department within Adama, mostly appears to have taken place as a result of managing the FTI project, rather than having a significant effect on efficiency during the project lifetime.

It should be noted that the lack of robust M&E and learning or feedback mechanisms is not thought to have significantly affected the efficient achievement of outcomes during the lifetime of the project, due to (a) the short timescale of the project and (b) the relatively simple, output-based focus of the project.

Effectiveness

Extent to which FTI activities achieved the intended objectives. In the proposal and reporting, outcome level results are not clearly distinguished from output-level results (training, greening activities and awareness-raising) on the one hand, and impacts (environmental, social) on the other. However, it can be considered that the appropriate outcome-level achievement would be the continued functioning, maintenance and use of the park.

In this respect the project can be considered to have largely achieved this outcome. The park is operational and SMEs have been contracted to undertake maintenance and some limited revenue-generating activities within the park, which can be considered a principal achievement at outcome level. There are also some facilities beyond the initial proposal (e.g., basketball courts) and the municipality supports ambitious plans to further develop the park, with a large meeting hall partially complete, as well as plots allocated for library facilities. The potential revenue generating activities and community benefits of such facilities are understood to be crucial for the sustainability of the site.

Challenges for effectiveness: However, there clearly remain a number of unresolved issues with the maintenance of the park, which may indicate a lack of effective response to challenges that have emerged, or anticipation in planning. According to the SMEs working in the park, a lack of water is a critical problem. As water is not available in the daytime, some SME members have to stay until 10-

[24] M&E spot report

[25] M&E spot report

11pm to complete their work. The Urban Sanitation and Greenery Development Directorate acknowledged this in interviews as a significant obstacle to development of the park, and stated that they will need support to explore other water sources, such as well water or rain water. The SMEs maintaining the park and its facilities also reported electric lighting as a basic facility the park is lacking, which (a) reduces the potential social and economic benefits of the park, and (b) also inhibits the ability of SMEs to carry out their work. Equipment and pesticides for invasive worms were are reported by the SMEs as lacking. A key measure to improve effectiveness in achievement of outcomes is prioritising these basic issues in subsequent planning for the further development of the site. Ongoing engagement with SMEs to understand these issues is critical for the maintenance of the park.

Another area where an opportunity for outcomes has been missed is in the undercapitalisation of the SMEs undertaking revenue generating activities. The cafeteria, despite having a spacious building, is a very small operation, without tables or chairs, or many refreshments on offer. The SME working in the cafeteria reports that:

> *Capital is our main constraint - while starting this project we all pitched in ETB 5,000 since we couldn't get a loan from microfinance, as we were asked to provide collateral against the loan we wanted to take.*

After one year of operation, the SME currently operating the cafeteria has not recouped its initial investment. This situation currently represents a missed opportunity for revenue generation and attracting visitors to the park.

According to a representative of the SMEs maintaining the park, the SMEs also lack formalised engagement with the city administration and suggested that with regular meetings with city officials many of the constraints they are facing could be resolved. This is indicates a broad need to institute feedback mechanisms with relevant partners to increase effectiveness of operations.

Photograph: Abel Abera (evaluation team)

Degree of coordination/synergies with other relevant initiatives and programs. The Interviewees from the municipality confirmed that a stakeholder workshop undertaken as part of the FTI project brought significant buy-in across the municipal administration, and was crucial to leveraging follow-up funding for the development of the park.

The workshop was led by an expert from regional urban office and personnel from the Urban Sanitation and Greenery Development Directorate. In the first session training was delivered for Adama City Cabinet members, the Adama City Administration, Adama University, Adama General Hospital and Oromia Broadcasting Network, with the workshop placing the project in the context of relevant frameworks and strategies (the CRGE Strategy and the National Urban Greenery Strategy). A consequence of this awareness-raising was the halting of any momentum to use the site for activities other than greening, and the workshop generally received positive feedback from across the municipal administration.

The project's primary engagement with other MoUDC projects was through example and as convenor of learning. In 2015 Adama hosted an MoUDC-wide workshop on the performance of the 16 urban sector FTI projects.[26] The project also itself took on board learning from other cities, with a team from the Cleaner City and Greening office visiting Hawassa and Bahir Dar to take experience from these cities. Both cities are widely considered exemplary in Ethiopia for their integration of greenery into city planning.

The low capacity of M&E at the time of the grant is not considered to have impacted effectiveness during the FTI project lifetime to a great extent (see Efficiency section). However according to the head of the Urban Sanitation and Greenery Development Directorate, the improvement in M&E and project management stimulated by the requirements of the FTI grant have generally increased the effectiveness of the department in managing longer-term projects. Experience of management the FTI project was cited as a key factor in enabling department to lead a local project (on composting) under the UNDP NAMA programme.

Due to a lack of access to appropriate the intermediaries between the CRGE facility and the local implementing agencies in Adama, it was difficult to find direct evidence of support and capacity building for data collection and measurement.

Impacts

Most identifiable impact. The project has achieved small-scale environmental and economic impacts. Environmental impacts achieved are difficult quantify and attribute, but the project can be assumed to have made limited contributions to:

- **GHG reduction,** through carbon sequestration.
- **Reduction of dust/erosion and flood risk.** This is cited in reporting and by interviewees, and is a major local problem. No systematic site-specific study of impacts from the project appears to have taken place, however it is evident from site observation of the presently undeveloped parts of the designated park area that land degradation had been present. There are also health benefits associated with this, a government stakeholder noting that as a result of the wider greening agenda in the city, Adama General Hospital has reported a reduction in eye inflammation related number patients over the past years.
- **Mitigation of heat island effect.** The project is assumed by interviewees to contribute to mitigating the heating of the microclimate of the city, and there is substantial academic literature confirming urban greening as an effective mitigation measure. It is however not possible to verify or quantify the impact in this case.
- **Avoidance of environmental harm**. As noted above, it had been widely presumed that the land-use allocation of the undeveloped site would be converted to housing, given the lack of previous funding for the planned park. The prevention of this was itself considered the main direct environmental impact by city greenery office.

The project also contributes to the CRGE M&E Plan indicator of increasing urban green area per capita (m2/urban inhabitant). The contribution of 7Ha (70,000 m2), represents an increase of 3.14m2/person for the total population of Adama. According to a government stakeholder interview the city does not appear itself to have a specific target for urban greening, although urban greening is reported to be integrated into policy.

There are also some limited economic impacts:

- **Job Creation**. Reporting does not record job creation at the end of the FTI-funded period. However, by the time of the project visit, 3 SMEs were operational in the park, in maintenance and running the facilities. From data gathered interviews, these employ 40 people (27 men, 13 women), although as some SMEs worked across sites, the number attributable to this project must be lower. This does however indicate the gender balance of the job creation.

[26] MUDCo Final Report

- **Local development.** Due to the recreational park further development the surrounding area was reported by government stakeholder interviewees): construction was resumed on a school that had been paused for 15 years, partially-built housing in the area has been completed and the land value around the park area is increased.

Sustainability

Extent to which results and impacts have been sustained. The site visit showed project outcomes reported in the final project report to have been largely sustained and built upon at the physical level. The park is operational over 7 Ha of land, and further facilities are under construction phase to make the park fully operational and revenue generating, most notably a meeting hall which the municipality intends to support by using it as a venue for public events. . It is also anticipated that the meeting hall will host private events (such as weddings).

Success stories

Catalytic effect of funding. Interviewees note that that there had been a widespread assumption that the park, earmarked for development since 2005, was unlikely happen, but the funding revived dormant plans and catalysed the wider greening agenda.

> *The impact of the park project is very broad, the impact is not limited to environmental [considerations. It is] creating a good environment for the community. The FTI project created jobs for many of us, and on top of that I manged to learn in college on my free time. – SME operator*

Overall, the evaluation team makes the following observations from the site visit:

- The park has been successfully developed in part of the designated area and is open to the public. Some facilities (a cafeteria, basketball courts) are completed, and the municipality has approved plans for the further development of the site.
- Development of further facilities is currently in progress, some of which go beyond the original plan.
- The major factors inhibiting maintenance and development of the park are the current lack of electricity and water supply due to city-wide shortages (although a water line has been laid). The municipality is aware of these issues and is considering plans to address this in a next stage of development.

Economic sustainability. Economic revenue generation is currently limited. There is a small cafeteria which serves soft drinks and coffee. The manager of the SME working in the cafeteria stated that they working under a very low capital and they could not get micro-finance loan because they are required to present collateral. Although each member contributed 5,000 Birr, at the beginning they have not recouped their investment. The lack of capitalisation for these revenue-generating activities is a missed opportunity for sustainability.

The city administration has a plan for revenue generation from the park, and the city revenue office is undertaking a study of pricing regarding the fee to enter the park and use different facilities. The meeting hall currently on its final construction phase is expected to generate significant revenue for park and municipality, which could contribute to further development of the site.

Community buy-in. Though difficult to measure, an increase in community cohesion has been reported by SME interviewees. The community has voluntarily contributed to the maintenance of the site, and have participated in protecting the park from both everyday criminal activities, as well as threatened damage during the periods of communal unrest.

Administrative and political buy-in and capacity. There is evidence of excellent buy-in from city administration and elected officials. The former Mayor of Adama (Adanech Abiebie) is noted by officials to have taken a particular interest in championing the development of the park. As the current mayor of Addis Ababa, this influence has extended further, and the park has been used as an exemplar at high levels of government. This connection may have proved influential in spurring the development of sites such as Shalla Park in Addis Ababa. Representatives of many other municipalities have also visited the park in Adama for learning, including seven sub-cities of Addis Ababa, Dessie city administration and Harar city administration. The park has been an example of a

wider trend in Ethiopia for municipal officials to champion development of green spaces. This trend looks to continue, although there may be a risk of relying on political will, and it remains important for greening targets to be institutionalised in policy.

There is evidence from interviews of the urban greening agenda being widely recognised in city administration, and (particularly with the increased capacity of the Cleaner City and Greening office) this now being integrated more extensively in broader and specific planning. Adama. The Mayor's intervention and buy-in was also crucial for freeing further funds for park, with an additional ETB 10 million of funding made available from the city administration.

For the Urban Sanitation and Greenery Development Directorate specifically, interviewees report that previously there had been a perception that its remit was limited (e.g., to campaigning on littering), and influence was marginal. However, successfully implementing a large-scale project has developed the capability to lead further major projects, including development of parks at other sites. and a composting project under the UNDP NAMA programme. There are also plans to develop new parks in two parts of the city for which land has been allocated.

This capacity development can be considered a contribution to the CRGE M&E plan enabler on strengthened government capacities to plan, resource and deliver green, climate resilient development results.

Lessons learned

Three key lessons from the project are highlighted:

- It has been important to the success of this and similar projects with limited timescales and funding that the municipality has seen development as long-term and incremental, and that project design integrated this consideration. This vision was backed up by appropriate further financing of the park's development.
- Revenue generating activities should be prioritised, integrated into the project design and fully capitalised. The lack of capitalisation for these activities is a missed opportunity for sustainability: revenue generating activities would provide revenue for both maintenance and scaling, and also increase buy-in for replication at other sites and a model for other municipalities.
- The design of greening projects needs to fully consider maintenance infrastructure, in this case water supply and power in particular.

RESTORATION OF DEGRADED AREAS THROUGH AFFORESTATION AND REFORESTATION

CRGE sector	Environment, Forest and Climate Change Commission (EFCCC)		
Regions	Tigray, Amhara, Afar, Oromia, SNNP, Benishangul, Harari, Somali, and the Addis Ababa and Dire Dawa City Administrations		
Timeframe	04/2014-09/2016		
Budget (project spent)	US$ 159,982 (Mount Jemo Wechecha component)		
Beneficiaries	31,620	**Rehabilitated land (Ha)**	7,606
Species planted	9,311,660		

Highlights

- Urbanisation is having substantial impact on the ecology, economy and society at local, regional, and global scales. There is a need to coherently manage terrestrial, ecological, physical and socio-economic components of urban ecological systems.
- This FTI project promoted rehabilitation of open urban/peri-urban space and degraded land, leading to enhanced green environmental condition and thereby ensuring additional carbon sequestration.
- The projects interventions have restored and reforested degraded forest areas through area enclosure and tree planting.
- Moreover, interventions have contributed to livelihood improvement, and building local economy and reducing poverty from incomes generated out of sales of cooking stoves, fruit trees and honey.

Context and background

Ethiopia has experienced massive deforestation over the past century. Reversing deforestation is crucial in order to maintain a healthy ecosystem that can provide a range of ecological services and thereby contribute to the national economic growth and development.

Protecting and re-establishing forests provides significant and precious eco-system services including protection of soil and water resources, controlling the discharge of water to streams and rivers, biodiversity preservation, carbon sequestration, and land fertility improvement. Despite their economic and environmental values, Ethiopian forests are under severe threat. These threats are also prevalent in urban and peri-urban areas as the growing population in these areas are often relying on forests to get firewood and charcoal for domestic cooking energy sources. As a result, the problems of forest and environmental degradations affect the urban ecosystems and lifestyle of the dwellers substantially.

Urbanisation will continue to have substantial impact on the ecology, economy and society at local, regional, and global scales. There is good understanding today that we need to coherently manage terrestrial, ecological, physical and socio-economic components of urban ecological systems. Urban green spaces are important for sustainable urban development. Urban green area development contributes to the beauty of the city by increasing forest cover, while also providing wide-ranging benefits including physical and psychological health, social cohesion, climate change mitigation, pollution abatement, biodiversity conservation and provision of the ecosystem goods and service to urban inhabitants. Moreover, urban and peri-urban greening would also contribute their parts in achieving the CRGE Strategy as they involve in rehabilitation of degraded lands and forests.

Overview of FTI project

The EFCCC sector FTI projects focused on restoration of degraded areas through afforestation and reforestation using indigenous tree species that naturally occur in the target sites. The projects have the goal of contributing to the country's CRGE strategy through achieving climate change mitigation objectives by contributing to the GHG removals. The key outputs of the EFCCC FTI projects included:

1. Forest cover in the projects' sites increased and hence volume of carbon sink increased;
2. Soil erosion and surface run off reduced;
3. Biomass and Biodiversity in the projects' area increased;
4. The capacity of the community in terms of integrated natural resource management and income diversification are enhanced, and
5. Household income and living standards are also increased, and thus dependency or pressure on natural resources are more or less reduced.

A total of 12 FTI projects were implemented under the EFCCC:

1. Climate Resilient Green Economy (CRGE) Project Proposal on Natural Resource Rehabilitation and Conservation in Selected Woredas of Southern Nations Nationalities and Peoples' Region (SNNPR);
2. Reducing land degradation and improving livelihoods in the highlands of the Amhara National Regional State;
3. Improving income status of women to create carbon sinks through reducing deforestation rate in Erer and Sofi woreda, Harari Regional State;
4. Promotion of highland bamboo plantation for ecosystem restoration and livelihood improvement in the eastern escarpments of the upper rift valley areas Oromia Regional State;
5. Afforestation/Reforestation in Karamara Hill/ Hadaw Kebele Somali Regional State;
6. Creating Climate Change Resilient Communities via innovative way of bamboo forest management in Selga 22 and MenageSelga Kebeles, Benishangul Gumuz Regional State;
7. Participatory Forest Management in Awale, Adada and Belewa Rural kebeles of the Dire Dawa Administration (DDA).
8. Application of Prosopis Juliflora Cement Bonded Particleboard for Low-cost House Construction in Afar Regional State;
9. Enhancing Highland Bamboo Management and Improving Livelihood of the Community in Oromia Region
10. Combating Forest and Land Degradation Induced by Charcoal Production and firewood, Somali region;
11. Integrated Forest Development and Management Project in Selected Weredas of Tigray Regional State; and
12. Mount Jemo Wechecha Ecosystem Rehabilitation in Addis Ababa.

The projects also included sustainable utilization of utilization of resources, especially bamboo and economic use of alien invasive species like Prosopis juliflora.

The evaluation team undertook a field visit to mount Jemo Wechecha, a degraded and abandoned and unoccupied vulnerable ecological area with an average slope of 20 percent. Mount Jemo Wechecha is located on the western periphery of the city in KolfeKeranio sub city Woreda 03 and covers an area of more than 30 ha.

The overall objective of the project was to support the development of a green economy through rehabilitating mount JemoWechecha in such a way that the city's environmental problems can be solved. Specifically, the objectives were:

- To increase the vegetation cover by planting 50,000 indigenous plant species;

- To scale up the environment and natural resources rehabilitation on 30 ha of lands through enhanced physical and biological soil and water conservation measures;
- To develop management plan for 30 ha of land; and
- To provide attractive space for public art displays and attract ecologically sound businesses.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. All projects have contributed to the country's CRGE strategy through achieving climate change mitigation objectives through GHG removals. Furthermore, the projects have complimented to the natural resource management goals of Conservation Strategy and Environmental Policy of Ethiopia, Integrated Watershed Management undertaken at national level, and social development goals of the Ethiopian government. The projects have also contributed to the tree planting goals set in the GTPII plan of the forest sector of EFCCC.

The JemoWechecha project was designed to contribute to the achievement of the CRGE strategic objectives through small scale urban open space green development in Addis Ababa. The project focused on protecting and re-establishing degraded and unoccupied/abandoned areas for their economic and ecosystem services including as carbon stock and creating healthy environment in an open green space area making the change to bring neutral or even positive impact on overall economic development.

Photo: Partial view of restored area at the edge of illegal settlement on lower part of Mount Jemo

Besides severe deforestation and land degradation, the JemoWechecha area is the frontier of illegal settlement. The project has implemented different restoration activities. These include construction of terraces, planting seedlings of indigenous trees and closing the areas from extractive uses and settlement. The project was highly relevant has contributed to solving critical problems at the site. It is also relevant nationally and contributes toward the target of restoring over 15 million ha, the national emission reduction targets, national commitments to the UNCCD and UNCCC targets like land degradation neutrality and intended nationally determined contributions.

Extent of ownership and leadership in development of investment plans and projects. The project was jointly developed by the federal ministry and Addis Ababa Environmental Protection Authority. Series

of facilitated consultation were held to design the project. The project was initiated in response to invitation of the CRGE facility to all relevant sectors to submit proposal.

Effectiveness

Extent to which FTI activities achieved the intended objectives. Overall, the 12 projects have restored and reforested at least 17,100 ha of degraded forest areas through area enclosure and tree planting. Over 8.3 million seedlings of trees, and 217,000 seedlings of fruit trees were planted. Forest-product based livelihoods were created through job opportunities on the project and forest-based enterprises, like bamboo handcrafts. Around 23 nurseries were also strengthened or established.

The various projects' interventions have contributed to livelihood improvement, and building local economy and reducing poverty from incomes generated out of sales of cooking stoves, fruit trees and honey. Around 32,495 people have benefited directly from the project's intervention, of which 12,175 were women. The livelihood options were diversified and enhanced, resulting in an increase in household income. The projects focused on poor women and jobless youth.

In order to observe implementation on ground and the current status, the evaluation team visited the Mount Jemo Wechecha Ecosystem Rehabilitation project site in Addis Ababa, as mentioned above. A total of 32 ha was rehabilitated as compared to the planned 30 ha, and were planted with indigenous tree species. The planted indigenous tree species mainly *Juniperus procera*.

The planted trees are thriving well, though they are quite stunted due to shallow soil. Since the site has be closed from extractive uses, livestock grazing, and other human uses, many species of indigenous trees and shrubs have regenerated. The common naturally regenerated indigenous species include *Carisa edulis* (agamsa), *Rosa abyssinica* (goraa), *Maytenus arbutifolia* (qarxammee), *Rubus apetalus* and *Osyris quadripartita* (waatoo). The project has also supported construction of physical structures like terraces.

Photo: The photo shows *Carisa edulis* and *Juniperus procera* in the restored landscape.

Impacts

Perceptions on impacts and the plausibility of sustained results by different stakeholders. The local communities are also satisfied with the success of restoring the landscape and additional societal

benefits. The local community in the area are benefiting from the beautification of the landscape and are using it as recreation site during weekends and social events. For sustainability, there is a need to increase participation of the surround community members, especially in services provision for potential visitors. We have also observed that terraces and other physical conservation structures are degraded and require maintenance. Beside guarding, the commission has to consider maintenance of conservation structures and enrichment planting of indigenous trees.

Sustainability

Extent to which results and impacts of the project have been sustained. As presented above the project were successfully implemented and has achieved their intended objectives. The achievements during implementation and the evaluation's team observation of the sustained project results four years after completion are strong indicators of the lasting impacts of the projects. The evaluation team have witnessed that it has stopped illegal settlement, has increased vegetation cover significantly, as compared to other open areas in the surrounding.

The project was implemented between 2014 and 2017. Since then, it is under the Addis Ababa City government Environmental protection and Green Development Commission. The commission has continued planting trees after the project implementation period, and is protecting the restored area with guards. There are 14 guards employed by the Kolfe-Keranio branch office of the commission.

Extent of active participation and support of projects by stakeholders. There is strong support and commitment of the government as demonstrated by continued technical support, follow up and employment of guards for surveillance.

The sector focal points have facilitated and accompanied the evaluation team during the field visit. Though the project has ended in 2017, the sector focal point at sub-city level is still following up conservation activities on the ground and providing technical supports as needed. They are also communicating with the CRGE Facility and other stakeholders at the federal level as needed.

On the other hand, however, the management of the restored area is not yet decentralised and put under participatory management of the local community. There are no organised natural resources management groups. Organizing community members into management groups, develop bylaws and clear management plan is vital for the success of the program in the long term. The area has a good potential for ecotourism, and can create job opportunities for the youth in the area.

Lessons learned

The FTI project on forest ecosystem restoration focused on achieving their targets of degraded areas restoration, and was successful. However, it lacked community level governance structure for participatory management, communal tenure security and legitimate and equitable sharing of the benefits; and a livelihood component for the surrounding community. Similar future projects should incorporate these considerations in their design.

DEVELOPMENT OF BASELINE AND MRV SYSTEM FOR GHG EMISSIONS FROM THE INDUSTRY SECTOR AND IMPLEMENTATION OF PILOT GHG REDUCTION THROUGH ENERGY EFFICIENCY

CRGE sector	Ministry of Trade and Industry (MoTI)
Regions	National
Timeframe	04/2014-09/2016
Budget (project spent)	992,000

Highlights

- Implementation of green growth components in the industry sector will be key in facilitating Ethiopia achieve carbon neutrality goal by 2025. Having a reliable baseline information and robust MRV system showing GHG investments and reduction towards meeting CRGE targets is critical.
- This FTI project aimed at addressing energy efficiency issues in the industrial sector and developing an accurate baseline and sector specific MRV system.
- The project investigated the opportunities for energy efficient production in five manufacturing sub-sectors (Cement, Textile, and Leather, steel &metal and food and pharmaceutical).
- The assessment helped in identifying inefficient systems within the manufacturing industries and proposed systems and technologies that reduce the GHG emissions from the industries.

Context and background

Over the past ten years, the share of industry to gross domestic product (GDP), as well as the proportion of manufacturing exports to the national export earning, remained relatively stable, at around 13 percent and 36 percent respectively. Next to agriculture and services, the GoE expects the industry to be the driving force for economic growth.

Implementation of green growth components in the industry sector will be key in facilitating Ethiopia achieve carbon neutrality goal by 2025. As the MoI was moving towards implementation of the CRGE Strategy, having a reliable baseline information and robust MRV system showing GHG investments and reduction towards meeting CRGE targets is critical.

Overview of FTI project

This FTI project aimed at addressing energy efficiency issues in the industrial sector and developing an accurate baseline and sector specific MRV system. The project planned to develop an accurate baseline data on GHG emissions from the sector and have the necessary system in place to monitor GHG emissions reductions and report aligned with the CRGE and GTP targets. It has also targeted developing one energy efficiency system for one industry, and install the system for each of the six sub sectors.

The following outputs were planned for the project:

1. Baseline development tool and baseline of emissions from industry sector
2. Industry sector specific MRV system
3. Capacity built within MoTI and relevant institutions on GHG emissions reduction and MRV
4. Developing energy management system and use of computers in energy management
5. Installing energy efficiency (EE) system in an industry

6 Building capacities MoTI and sector agencies on energy efficiency

7 Improvingd diffusion of energy management systems and best practices.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. Ethiopia's industry sector shows the highest emission growth rates of all sectors in the CRGE Strategy, as its output is rapidly growing and its processes are very emission intensive. Overall, industrial emissions are projected to grow by 16 percent per year from 4 Mt CO2e today to 71 Mt in 2030.

Although the cement sub-sector has been highlighted in this report because it represents the most GHG emitting industry and its GHG abatement initiatives have high chances of implementation, the GoE wants to take action to put other industrial sub-sectors also on a sustainable economic development path. The textile, leather, and fertiliser industries, in particular, are important parts of the envisaged economic development model. The government aims to promote, among other initiatives, energy efficiency and the usage of alternative fuels in these subsectors.

It is evident that the industry sector will play a significant role in moving Ethiopia to the middle-income country 2025. However, more need to be done in the sector to make it carbon neutral. However, there are three critical gaps:

1 Firstly, the GHG emissions are estimations

2 Secondly, even though there are abatement levers identified, there is no measuring and reporting mechanism in place; and

3 Thirdly, the capacity of MoTI to implement CRGE is low.

This project sough to address assessment and calculation of GHG emission following internationally acceptable standards, verification of data and reported GHG emission and understanding and promotion of GHG emission reduction activities.

Effectiveness

Extent to which FTI activities achieved the intended objectives. In order to measure progresses made in emissions reduction, it is crucial to have a reliable baseline information that is based on internationally recognized MRV standards and protocols. This will assist the overall sectoral emission reduction by identifying emission reduction targets of specific manufacturing industries. To this end, the project conducted a GHG inventory of 52 industries from different manufacturing sectors, which has helped in establishing the baseline. In addition to having accurate baseline, having an acceptable and accurate system for measuring and reporting GHG emissions is necessary. The sector did not have a system to measure, report and verify GHG emissions from the industries in Ethiopia. The FTI project has supported the design and implementation of an MRV system.

The CRGE industry sector strategy aims to promote green growth through a number of initiatives ranging from changes in technologies in key manufacturing sectors. The green manufacturing path includes the adoption of energy efficient systems and technologies, alternative fuels sources and alternative production processes. Energy efficient production systems provides the capability to reduce GHG emissions very significantly by allowing higher levels of production for the same amounts of energy use.

The MoTI has implemented energy efficiency for GHG reduction in five selected industries from five manufacturing sectors. The project interventions involved three components:

- Conducting energy audits of the selected manufacturing industries. This includes the audit of the manufacturing industries to identify their energy systems, use and efficiency.
- Proposing energy efficiency measures, i.e., identifying processes and systems and
- Implementing the proposed energy efficiency measures, which includes changing of production processes, repair of systems or implement efficient technologies.

The energy efficiency project investigated the opportunities for energy efficient production in five manufacturing sub-sectors (Cement, Textile, and Leather, steel &metal and food and pharmaceutical). The assessment helped in identifying inefficient systems within the manufacturing industries and proposed systems and technologies that reduce the GHG emissions from the industries. The proposed energy efficiency projects, however, were not implemented due to lack of regulatory frameworks (regulations), finance and technical capacity.

To summarise, the FTI project was successfully implemented and has partially achieved its intended objectives. By the end of the project's implementation period, the project had achieved the following:

- Conducted a study which established baseline and a system for measuring, reporting and verification of emissions from the industry sector; and,
- Have identified gaps in energy efficiency for five manufacturing industry sub-sectors.

Lessons learned

For the industry sector, the FTI project was new and served as an opportunity for learning-by-doing. A key lesson from the project has been the need to engage pertinent technical experts in project design due to the limited knowledge on industrial GHG survey and verification process.

SOLAR POWER FOR WATER SUPPLY AND IRRIGATION

CRGE sector	Ministry of Water, Irrigation and Energy (MoWIE)		
Regions	Oromia, Amhara, SNNP, Tigray		
Timeframe	2014-17		
Budget (project spent)	US$ 2,599,844		
Beneficiaries	147,000	**GHG emission reduction (tCO_2)**	1,233t per annum

Highlights

- Lack of grid power in the deep rural areas of Ethiopia have made the case to use solar powered decentralised systems to meet with the overarching national targets of irrigating land.
- The project replaced 42 diesel powered water pumping systems with solar powered systems in four regional states (Oromia, Amhara, SNNP and Tigray) and provided sustainable water to the community in environmentally friendly manner with lower lifecycle costs.
- Beneficiary communities are using drip irrigation systems to efficiently manage available water, scale the farm size and increase their economic income. This has allowed them to decrease the time invested in watering the seedlings and have more time allocated for other income generating activities.
- The success of the project has led to mobilization of additional funds from the Governments of Denmark, Norway, Italy and the UK.

Context and background

Ethiopia has made impressive gains in increasing the densification of its grid network across the country. However, despite the impressive grid expansion, the percentage of electrified households remains low at only about 45 percent, 11 percent of which are electrified through off-grid solutions.[27] The GoE launched the National Electrification Program (NEP) in late 2017 with the vision to increase grid connectivity to 65 percent of the population and off-grid connectivity by 35 percent by 2025.

Prior to the NEP, the GoE had drafted the Energy Policy in 2013, which was the anchor upon which the FTI projects were developed and identified energy as a main driving force for the economy. Since then, the GoE has made significant investments in developing its hydro and wind resources to meet with the increasing energy demand with the growing economy. However, 80 percent of the population still live outside the grid area and have settled in a sporadic manner making access to energy difficult and expensive. Solar, wind and micro-hydro power are identified in the 2013 Energy Policy as an efficient mechanism to reach the population residing outside the grid in the most economic and efficient manner. At the same time, despite good progress made in terms of urban water supply, significant part of rural population of the country remains without access to potable water supply. The national water coverage was 70 percent at the end of 2013 with all rural supply systems relying on either a hand pump or diesel/petrol powered systems. These provisions are either expensive to run and or maintain, with frequent breakdowns affecting the sustainable supply of potable water system. Moreover, the diesel/petrol generators emit greenhouse gases estimated to be about 3 Mt of CO_2e.

Currently, there are numerous initiatives financed by the government, private sector through power purchase agreements (PPAS) and development financiers to diversify the Ethiopian energy generation mix. The government of Ethiopia foresees a stable regulatory framework to be the driver to continue its green commitment in meeting with the accelerating energy demands of the country.

[27] Analysis from Africa Energy Outlook 2019, Ethiopia.

To address the sustainability of water provision and also to limit greenhouse gases emissions, as set out in the CRGE Strategy, the MoWIE developed an initiative to install 20,000 solar and wind powered water pumping systems. Moreover, the MoWIE also plans to replace 10,000 existing diesel pumps with solar and wind powered systems. This plan was designed in line with Ethiopia's Program of Adaptation to Climate Change (EPACC). The FTI project thus follows on the EPACC principle of using renewable energy systems.

Overview of FTI project

In line with the CRGE Strategy, the objective of this project was to replace 42 diesel powered water pumping systems with solar powered systems in four regional states (Oromia, Amhara, SNNP and Tigray) and provide sustainable water to the community in environmentally friendly manner with lower lifecycle costs. This project was part of the MoWIE's initiative to develop 20,000 new water supply schemes through solar and wind powered water pumping system and also to replace 10,000 diesel powered pumps with solar and wind systems by the year of 2020.

Lack of grid power in the deep rural areas of Ethiopia have made the case to use solar powered decentralised systems to meet with the overarching national targets of irrigating land. This project therefore also serves to provide an alternative solution to meet with the national ambition of setting up irrigation schemes through using systems and infrastructure that are climates resilient, economical and sustainable.

This project was designed to mainly roll out solar water pumps for water supply and as conditional allow, also for irrigation purposes. The MoWIE co-ordinated the delivery and implementation of this project in collaboration with regional administrations and bureaus, woreda Water and Energy Desks and local communities.

Key outputs of the project included:

1. Strengthening the capacity of Renewable Energy Water Pumping Study and Development Team at MoWIE
2. Establishing and capacitating project implementations units at the Regional States.
3. Conducting Launching workshop for implementing and primary stakeholders.
4. Implementing the Project in two phases
5. Recruiting two Consulting Firms for Project Administration and installation Supervision in emerging regional States (one for Gembella and B/Gumuz and one for Afar and Somali Regional states)
6. Material Procurement, Supplying and Installation of 42 solar water supply pumping units
7. Training for Woreda Water Office and Community Technicians:
8. Material procurement and development of solar-powered irrigation: and
9. Conduct mid-term review.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. The project was designed to meet with the overarching national plan of Ethiopia during that period (GTP II), which also embeds the CRGE Strategy priorities. The project was cross-cutting in its nature and spanned across the energy, water and irrigation sub-sectors. The project anchored on the MoWIE's Universal Water Access Policy of 2003, a policy that decentralised the institutional framework with the nine political administrative regions for speedy implementation. This project was developed to build on the existing knowledge of designing and implementing solar and wind pumping systems by experts in the MoWIE and to replicate the lessons learned and success achieved in 42 woredas of the four main regions of Ethiopia. The project was also aligned to the GoE's Sanitation Strategy, the World Bank-supported Integrated Water Resources Management Policy, the Rural Water Supply and Sanitation

Initiative and the overarching national development strategy to design water supply systems powered by solar and wind technologies.

Extent of ownership and leadership in development of investment plans and projects. According to a senior official within the MoWIE, the FTI project was in essence designed to address food security, energy and water issues at the ground level, where the project design process followed a bottom-up process. Projects were identified at the local level and later on prioritised and screened in line with the policy priorities at the regional level. Regions prioritise projects at the woreda/district level to identify needs and gaps and discuss these with the local communities. Once projects are prioritised and approved at the regional level, the federal level actors such as the MoWIE worked closely with the CRGE Facility, line sector ministries and federal entities to mobilise funds, stream line communication channels, create awareness and build capacity at the various levels.

A weakness in the design of projects was that siloed approach was followed, as opposed to integrating the projects to feed into each other to increase impact. For example, projects designed to replace diesel generators with solar PV to pump potable water need to have a programmatic approach by way of also including provision of water for irrigation purposes, health and or school facilities amongst others. This could have been achieved should there have been a robust communications channel between the MoWIE and the MoA including the design of a robust implementation structure for better coordination. This approach was reflected during the design stages of the FTI projects where teams from the MoWIE focused on the provision of potable water supply projects in a certain woreda whilst team sitting within the MoA focused on designing small scale irrigation projects in other woredas and regions. On reflection, it would have been beneficial to have both MoWIE and MoA involved in the design of water supply projects for potable use as well as irrigation from the same solar PV system thereby scaling the impact of the project. While some of the FTI projects revisited their design and followed the programmatic approach by way of integrating water supply for potable use and irrigation systems at the later stages of implementation, these approaches were not considered during the initial design stages.

Extent to which gender, safeguards and inclusion were considered in the design and implementation of activities. Interview with key officials within the MoWIE indicated that the project was designed to be implemented in select woredas that had a significant number of girls dropping out from school as a result of the need to collect potable water to their family. Moreover, when the configuration and geographic proximity to health centres and schools from the solar PV site allowed, the project added components in certain woredas to provide potable water and also power local health centres and schools. This allowed for women to give birth within the health centres as a result of access to clean water and energy making the health centre functional with running water, working refrigerators, extending the life time of medicine and availability of light.

Efficiency

Feedback processes to facilitate decision making and learning. Notwithstanding the regions of Gambella and Benishangul Gumuz, where only 7 out of 20 planned outputs were implemented, the FTI project's project management and implementation approach from the woreda to the federal level was efficient. However, during the evaluation team's field visit, finding the required documentation was difficult at the woreda level. While the team is cognizant of the fact that there is a high degree of expert turnover at the woreda level and lack of computers to support record keeping and reporting, these could be improved through following the CRGE M&E system manual's protocols.

Extent that arrangements permitted and facilitated effective participation and voice of different categories of stakeholders. There is a strong sense of ownership of the project results by the local communities, which is a result of the bottom-up approach adopted in the consultation and planning phases including identification of the appropriate technologies. This was validated during the team's field visit as Kersa Woreda of Oromia Region. The community has assigned security guards at both the solar PV and the water points who were receiving a salary of ETB 950 per month from the fees collected. Furthermore, the community was able to self-finance minor repairs and part replacement from the savings made from the water payment deposits made by the community.

One of the main challenges for the lack of structured project documents was attributed to the assignment of an ad-hoc CRGE focal person by the CRGE Focal Ministry during the initial period of rolling out the FTI projects. The focal person was assigned to manage CRGE initiatives in addition to

other assignments that the experts were already undertaking in their existing portfolio. This led to over burn and limiting the attention paid to the delivery and reporting of the FTI projects. Added with the high rate of employee turnaround, it resulted in the lack of proper documentation. Cognizant of this fact and as a lesson's learned, which was evident during the period of the evaluation, the CRGE Sector Ministries have added the Environment and Climate Change Directorate into their operational structure with its own budget, director and team of experts to design, deliver and monitor the implementation of climate focused initiatives across the regions.

Streamlining the Environment and Climate Change Directorate to also work with the Women's, Children's, and Youth Affairs Directorate within the same ministry has also increased the rigor projects are screened through the inclusion of gender and youth objectives in the planning and design stages. In general, MoWIE initiatives work directly to benefit women and children in terms of accessing affordable energy, potable water and addressing health issues. These include but not limited to respiratory issues on women which is a result of the carbon heavy smoke emerging from the use of fuel wood for cooking purposes. Inhaling heavy amounts of carbon brings about child birth issues, miscarriage, eye irritation, lung diseases and increased death rate mainly due to respiratory issues.

Availability of M&E reporting, including measurable indicators, processes for collecting data. Financial management and reporting against the funds disbursed for the FTI projects across all target woredas followed the CRGE Facility Operational Manual. Accordingly, during the initial phases of the FTI project implementation, the CRGE Facility disbursed project funds through the MoWIE and vertically to the regions and later to the woreda water and energy desk. This followed the project fund disbursement schedule against the milestone as approved in the project proposal by the Facility. However, the lack of evidence and supporting documents at the woreda level against the funds that were disbursed by the CRGE Facility called for revisiting its fund disbursement channel in its manual. Facing these challenges, the CRGEE Facility revised its manual and revisited its fund disbursement channel from what used to be through the CRGE Sector Ministries to Channel 1. This change improved the CRGE's Facilities ability to efficiently manage funds, increase the quality of the financial reports it was receiving and increased the pace of project implementation on the ground as it was able to receive more reliable data from each FTI woreda and regions which enabled it to quickly release the required resources.

Effectiveness

Broad outcome areas where projects achieved significant results. The replacement of the diesel generator by the solar PV system at the Mazoria Gulba Kebele in Kersa Woreda of the Oromia region that the evaluation team visited reflected a strong sense of project impact that went beyond the intended results on the ground level. The 42 project sites where the generators were replaced by solar PVs through the FTI projects informed the design and implementation of over 300 projects beyond the FTI's within the MoWIE's portfolio that were otherwise to be powered by diesel generators. The MoWIE experts that were trained to design solar projects rendered their expertise beyond their counter parts at the ministry to the private sector. Private sector firms were able to learn tangible lessons that enabled them to carry out the design and supply of solar PV systems across the various parts of the country including supply of spare parts to the FTI projects amongst others.

Degree of coordination/synergies with other relevant initiatives and programs at the region/woreda level. The experience and lessons from the FTI project were critical in informing the Climate Resilient-WaSH (CR-WASH) project that was designed by DFID (now FCDO) during that time and currently being implemented in various regions of Ethiopia.

Data gathered from the Water Development Commission (WDC) and looking carefully at the budget allocated for solar PV before and after the implementation of the FTI project revealed that there is a significant increase in budget allocation towards solar PVs. While it could be difficult to attribute the increase of the budget as a result of success of the FTI project, interviews with key informants indicated that to a great extend the increased budget towards solar PVs is attributed to the FTI experience.

The success of the FTI project have been able to mobilise additional funds from the Governments of Denmark, Norway and the UK. The Italian government through a special financing vehicle agreement has provided Euros 1.3 million in grants to the MoWIE to replace 22 diesel generators by solar PVs.

Impact

Most identifiable impact of FTI projects. During the team's evaluation visit to Kersa Woreda, the team was able to validate the programmatic approach of this particular project where ground water pumped for potable use was also being used to water onion, carrot and garlic seedlings. Whilst the number of beneficiaries from these initiatives were limited to 10 members of the community, tangible outcomes have been noted as a result of the project.

Interview with one of the project beneficiaries indicated that the members were able to reap 10 quintals of onions, 5 quintals of garlic and 2 quintals of carrot twice a year, thereby significantly increasing her income. In today's market, the members are able to make ETB 50,000 per harvest or ETB 100,000 per year, which is equivalent to about US$ 2,500, well above the average incomes in Ethiopia's rural areas.

Success story

Ten residents in the Mazoria Gulba Kebele have established the Abdi Boru Seedling Community as a result of replacing the diesel Generators by a Solar PV and reliable supply of water. The community is currently growing onions, garlic and carrot using drip irrigation systems to efficiently manage available water, scale the farm size and increase their income. This has allowed for the members to decrease the time invested in watering the seedlings and have more time allocated for other income generating activities.

> *"Water is life, without water no one can survive" – Ms Atsedu Tufa, Abdi Boru Seedling Community Member, Kersa Woreda*

Learning from the market fluctuations from last year's onion harvest and understanding demand and supply side of the market, she stated that harvesting the right produce at the right time will yield increased income. For example, when this evaluation was being undertaken, the members were preparing to sell their produce for the upcoming Easter where prices for onions and garlic would dramatically increase. She further noted that growing seedlings is currently being replicated by other members of the community through the use of drip irrigation technologies to efficiently manage the available water resources. However, when more and more communities delve into irrigation, supplying enough amount of water to all their needs will become a challenge thus underscoring the need to consider a programmatic approach in project design right from the inception stages.

Photos from site visit to Kersa Woreda

Perceptions on impacts and the plausibility of sustained results by different stakeholders. According to a member of the beneficiary group, the main driver for the community to commence practicing small scale irrigation was mainly attributed to the replacement of the diesel generators by the solar PVs. According to him, the diesel generators were prone to frequent shutdowns or breakdowns due to lack of fuel, parts and or other technical challenges which made reliable supply of water not possible. The replacement of the diesel generators by the new system has made it possible for the community to receive potable water all year round, which was later expanded to also include seedling watered through expanded network systems and currently being replicated by other communities in the same and adjoining kebeles. He further stated that the drip irrigation system saves water, efficient in terms

of regulating water supply, less energy consuming as there is no need for man power to water the seedlings and possible to efficiently scale productivity.

Extend to which external factors challenging execution and influencing impacts. During the period the FTI project was developed, the MoWIE had planned to replace 500 diesel driven water supply systems to solar water pumping systems in line with the Green Economy Strategy. The MoWIE has since finalised development of 300 out of the planned 500 systems and couldn't finalise developing the remaining 200 solar sites due to acute shortage of FOREX.

Specific gender impacts. There is a strong evidence that the project has brought about meaningful impact in the lives of women, children and the community in general. The impact that was observed has spilled over to the neighbouring woredas including informing the regions and the federal level that solar powered water pumping systems are sustainable solutions. While there are caveats in terms of available capacity in scaling the technology across the country, including lack of clarity on taxation regulations in importing solar PV systems, there is evidence that the technology is effective and sustainable.

Solar PV systems are socially acceptable, economically feasible both in the mid and longer term, equitable, scalable and environmentally friendly. Health centers and schools in the kebele have also benefited from the supply of potable water. The same water point has been scaled by the community to grow seedlings which not only increased the nutritional content of the produce supplied in the local market but also the economic gains made by the members of the association.

Sustainability

Extent to which results and impacts of FTI projects have been sustained. At the ground level, there is a heightened sense of awareness by the community on the benefits of solar PV. At the Kersa Woreda that the evaluation team visited replaced diesel generators by solar PV's in three kebeles: Mazoria Gulba (Team visited this kebele), Habru Wenber and Goro-Gabriel. The number of active water point users currently include 1,650 out of 2,475 residents; 5,000 out of 3,241 and 2000 out of 4,156 HH or a total of 43,250 people respectively use the water points in the three kebele's. Interestingly, the number of water point users in Habru Wenber Kebele was more than the residents whilst there were lower number of water point users in the other kebeles. Key informants at the local level explained that there are numerous water points that have been built by the government in the Kersa Woreda and hence residents prefer to fetch water to the nearest waterpoint. The kebele representatives further underscored that the community is asking for the government to replace the existing diesel generators by solar PV's as the diesel ones are expensive to run and frequently break. The kebeles of Kore Sabi, Awash Silte, Adadi and Goro are currently seeking replacement by solar PV as they are more aware of the technology and its sustainability.

Discussions with the beneficiaries, kebele and woreda representatives, indicated that replacement of the diesel generators by the solar PV's has seen an interrupted supply of water to the community in the respective three kebeles and beyond for the past three years. The representatives mentioned that due to lack of provision of preventive maintenance awareness to one of the Kebeles, the solar PV had failed and required replacement of parts. Proper awareness has since been built by the kebele in the community and the system has been running flawlessly since the parts were replaced two years ago.

According to the Woreda official, the three main points the FTI projects influenced the decision of other kebeles to be powered by solar are:

1. Proven sustainability.
2. Community savings from the water fees are not touched; and,
3. Daily transportation of fuel is not required.

Interviewees at the federal level indicated that the existing bottom-up approach that is followed by way of participating the community to identify projects, and inform investment prioritisation is an efficient way of designing sustainable projects. For this particular project, the following four points have been raised as critical to ensure sustainability of the project:

1. Projects are designed to benefit the local community;
2. O&M including parts for the infrastructures are accessible and affordable;

3 Private sector engagement for services and parts; and,

4 Identify a technology that requires minimal repair and supervision.

The solar powered water projects however also come with their own challenges. Two points have been identified as the main barriers/challenges:

1 Solar PV is new and an advanced technology. Identifying capable experts with the required experience in designing and developing the solar PV systems has been a challenge. For this technology to be scaled at the national level, Training of Trainers (ToT) at all levels is essential which would require substantial amounts of resources and time.

2 For the solar technology to be scaled, private sector involvement is highly critical. The MoWIE has been working in activating the market whilst the private sector is essential to accelerate the solar PV market. While there are still challenges and lack of clarity in existing importation regulations particularly with regards to the PV cells, the government has outlined a clear road map on how to engage with the private sector in the NEP.

Extent of active participation and support of projects by stakeholders at all levels. The kebele officials further iterated that replacement of the diesel generators has significantly decreased the burden that was imposed in terms of cost and technical challenges that the diesel generators required to be tended to by the Kebele. They further underlined that the limited financial resources available at their disposal and limited number of experts available are now deployed to other sites that would require frequent attention. One of the representatives stated that:

> *We are very much happy with the project as there are in essence no issues, we are facing with the solar system for the past three years. The system doesn't fail, fuel costs are not there, parts don't regularly fail and has reduced so much pressure on this particular kebele as a result of installing the Solar PV. [He further stated that] The Kersa Werko Kebele that is nearby has a drilled bore hole that runs on a diesel generator. The generator fails frequently, fuel runs out and saved money by the water committee is lost mainly due to maintenance. The community there are frequently putting in their request to be switched to the Solar system.*

Lessons learned

Two key lessons from the project are highlighted:

- **Need for a programmatic approach.** More often than note, project implementation is siloed – water, irrigation, solar, biogas initiatives for example. It will be beneficial if similar future programming of activities involves both MoWIE and MoA.
- **Coordination arrangements.** The FTI project had planned in Amhara, Oromia, SNNP and Tigray region to replace 20 diesel powered water pumping systems with solar powered systems but 7 are developed.

STRENGTHENING THE MONITORING CAPACITY OF PETROLEUM DOWNSTREAM OPERATIONS

CRGE sector	Ministry of Water, Irrigation and Energy (MoWIE)
Regions	National
Timeframe	2014-17
Budget (project spent)	US$ 635,000
Beneficiaries	4

Highlights

- The petroleum downstream sector is faced with a certain type of malpractices including adulteration and product theft in the supply chain. The consequences of adulteration include health problems, deforestation and indoor air pollution, fire hazards, corruption, organized crimes, a hindrance to the biofuel utilization for transport as well as deprivation of quality products to the end-user.
- The project aimed at enhancing the monitoring capacity of the Petroleum Downstream Operations Regulatory Directorate (PDORD) and relevant institutions of regions with mobile and stationery petroleum products testing laboratories, and training of trainers abroad.
- The Stationary and Mobile Fuel Laboratory Equipment was non-functional after the completion of the project. No entity was using the laboratory equipment for the last 4 years due to a combination of staff turnover and inadequate training on how to use the stationary and mobile fuel laboratory.

Context and background

Economic growth is directly related to the supply of energy including petroleum products. The Ethiopian economy which is a non-oil driven economy has been growing more than 10 percent in the last nine years and is expected to do so in the future. This strong economic growth in the meantime is influencing the petroleum products' demand. In 2014 the petroleum products' demand was growing by about 10 percent. This is costing the country more than 70 percent of its hard currency earnings annually.[28]

The petroleum downstream sector is faced with a certain type of malpractices including adulteration and product theft in the supply chain. The existence of price differences between fuels is providing the incentive to the ongoing adulteration along the supply chain. The adulteration of petroleum products including gasoline and diesel with kerosene ranges from 10 percent to 40 percent.[29] The consequences of adulteration include health problems, deforestation, indoor air pollution, fire hazards, corruption, organized crimes, a hindrance to the biofuel utilisation for transport as well as deprivation of quality products to the end-user.

Thus, ensuring the reliable distribution of quality petroleum products in the supply chain is of prime importance. For this to happen there is a need to enhance the monitoring capacity of the Petroleum Downstream Operations Regulatory Directorate (PDORD) and relevant institutions of regions which includes strengthening PDORD with mobile and stationery petroleum products testing laboratories, and training of trainers abroad.

[28] Ethiopian Petroleum Supply Enterprise 2014.

[29] Adulteration of fuel products in Ethiopia' and recent studies.

It was very important to mitigate climate change caused by petroleum products' quality deterioration due to adulteration and other reasons, improving the air quality and lower the social, economic, and environmental costs through minimization of petroleum products' adulteration. To alleviate the problem, this FTI project aimed to procure a stationary and mobile laboratory equipment and build capacity through a training of trainers (ToT).

Overview of FTI project

The project was implemented from 2014 to 2017 with three main objectives:

1. Mitigation of climate change caused by petroleum fuel products, quality deterioration due to adulteration and other reasons;
2. Improving the air quality; and,
3. Lower the social, economic, and environmental costs through minimization of petroleum products' adulteration.

The project sought to achieve its objective mainly by capacitating PDORD and relevant regional bodies with laboratory equipment and skilled manpower to effectively monitor and regulate the operations in the petroleum supply chain. This in turn, is expected to have an impact on the reduction of emission and air pollution as well as on costs to end-users and the environment.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. The project has been strategically aligned to the Ethiopian's Climate Resilient Green Economy (CRGE) initiative by reducing petroleum product adulteration the project emerged to redressing the systemic bottlenecks in petroleum product supply chain in Ethiopia. As a result, pollution due to adulteration is expected to decrease, quality of products will be maintained and that will help the petroleum downstream sector to continue its contribution to the overall social and economic development of the country.

The regulatory office at the federal and regional level has a mandate to regulate and monitor petroleum downstream operations, Unfortunately the regulatory offices were not equipped with proper laboratory equipment to perform regular inspection and monitoring, with the support from FTI the project stationary and mobile fuel laboratory equipment procured and PDOR staffs were trained to effectively monitor and regulate the operations in the petroleum supply chain.

Extent of ownership and leadership in development of investment plans and projects. The project received adequate support from relevant stakeholders, including CRGE Facility and Ethiopian Petroleum Supply Enterprise (EPSE), in terms of capacity and developing Terms of Reference for international procured equipment. The design of the project has concisely constructed activities and outputs that are well linked to the planned objective. In addition, the project document has a clear outcome, outputs activities that the project aspires to achieve with associated risks, monitoring and evaluation framework with the expected results, indicators and means of verification.

Extent to which gender, safeguards and inclusion were considered in the design and implementation of activities. The project has addressed gender, safeguards, and inclusion in its design. As stated in the project document women will have a better chance of getting quality kerosene for their household needs, the project by design acknowledges the benefits towards gender equality and equity. In addition, the project design assesses safeguarding measures stated under Proclamation 299/2002 and Regulation No. 1/2007 for the national environmental and safeguards requirements.

Efficiency

Extend to which activities and outputs were delivered according to plan and budget. In assessing efficiency, the case study examined how efficient PDOR was in using available resources like finance, materials and skills gained from the training given internationally and locally.

The project has three outputs:

1. Procurement of Stationary and Mobile Fuel Laboratory Equipment;

2 Human capacity building for four staffs in India

3 Human capacity building for eleven regions experts, locally,

As seen in Figure 4 the overall performance of the project in terms of activities shows 79 percent accomplishment rate. For output one and two the project shows significant performance in delivering the stationary and mobile fuel laboratory equipment and training four staffs internationally as per the original plan, whereas for output three the original plan was to train eleven regional experts, but training was given only for four staffs from four regions, due to bureaucratic process in selecting training centre and trainees.

The project's financial performance was moderately efficient, with 74 percent of the total budget utilised, as seen in the Figure 5 below. 79 percent of the budget was used for procurement of stationary and mobile fuel laboratory which is equivalent to US$ 401,059.26 and from a total of US$ 125,550 which was allocated for capacity development component only US$ 67,000 was only utilised.

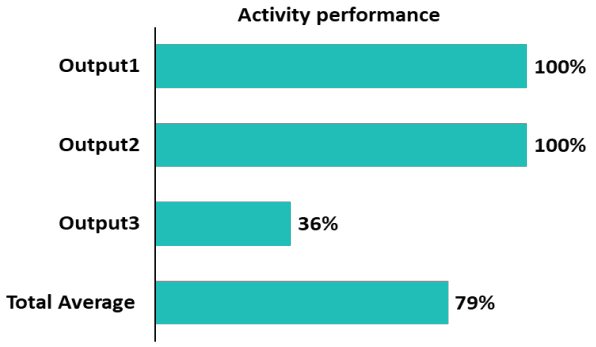


Figure 4. Activity performance

Source: FTI Final Report

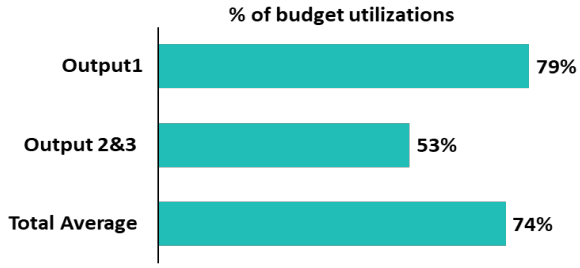


Figure 5. Budget Utilization

Source: FTI Final Report

Even though the project shows moderate efficiency in terms of delivering activities and budget utilisation, the project was delayed by two years: initial plan was to be implemented from May 2014 to October 2015, but the project run until 2017. The main reason for the delay was the delay in finalising the procurement process. Specifically identifying specification for the stationary and mobile laboratory and lack of expertise in international procurement and contract administration.

Availability of M&E reporting, including measurable indicators, processes for collecting data, and feedback processes to facilitate decision making and learning. All the project indicators do not have baseline values which are crucial to see the changes of the interventions, applying the CRGE overall Results Framework. From the KIIs all participants agreed that the project had some visible gaps and clear areas for learning. Gaps identified for improvement include:

- Needs assessment should be in place before procuring new and advanced equipment;
- Experts should advice before acquiring new and advanced equipment;
- Selection of participant for training both locally and internationally should be clear and transparent; training should be given for those who are directly involved with the equipment; and,
- Emphasis should be given for knowledge transfer.

Extent that arrangements permitted and facilitated effective participation and voice of different categories of stakeholders. The Project has been implemented with well-organized coordination and management framework, appropriate institutional arrangements in Federal and regional levels were set-up and found to be functional in all the implementation area.

Effectiveness

Extent to which FTI activities achieved outcome level results. The project outcome was capacitating the PDORD and pertinent regional bodies with laboratory equipment and skilled manpower to effectively monitor and regulate the operations in the petroleum supply chain to effectively monitor and control the system. According to the qualitative assessment through KIIs, the project model was appreciated by the government officials but higher-level results were constrained by internal and external challenges. Even though the laboratory equipment's and training were given to PDORD staff, there was major factors influencing the achievement of outcomes.

Photos depict the mobile fuel laboratory (left photo) and stationary fuel laboratory tester (right photo).

Impacts

Most identifiable impact. The project design is strategically aligned to Ethiopian's priority development agenda by decreasing emission of CO2 and HC through effective monitoring and controlling of petroleum adulteration. According to a qualitative assessment through KIIs, the project was not impactful, the stationary and mobile fuel laboratory equipment and the human capital lacks coordination and the implementation was not vibrant enough to achieve the intended impact.

Extend to which external factors challenging execution and influencing impacts. Most of the staff who took part in the training are either transferred to another department or left the institution, which has created a vast knowledge gap in operating the stationary and mobile fuel laboratory. In addition, emphasis should have been given on accessing continuous supply for the reagents /calibration chemicals before acquiring the laboratory equipment. Currently the laboratory equipment is outdated and non-functional due to overdue of calibrations and chemicals.

Sustainability

Extent to which results and impacts of FTI projects have been sustained. The stationary and mobile fuel laboratory equipment is non-functional after the completion of the project. No entity has been using the laboratory equipment for the last four years. Major factors influencing the achievement of the project outcome:

- **Long and bureaucratic procurement process for internationally procured goods/services.** The estimated lead time for international competitive bid for any goods is more than 52 weeks as per the Federal Public Procurement Manual issued by MoF. Emphasis should be given on design of the project that major procurement activities such as developing and finalising bid document, floating bid document, establishing technical and financial committee, awarding, and signing of the contracts, delivery as per the contract, inspection and acceptance will take more than one year.

- **Limited knowledge of international procurement.** The project lacked staff with adequate knowledge on international procurement, such as list of international suppliers, demand-based specifications, where to float bid document to attract efficient vendors, inspection, acceptance and so on to expedite the procurement process and to avoid any complaints after the delivery of the equipment.
- **Adequate/practical training on how to use the stationary and mobile fuel laboratory**. Staffs who took the training were not satisfied with the theory-based training as the equipment's demand practical trainings for better application. Currently staff at the PDORD are not able of using and interpreting results for oil and petroleum tests.
- **Training participants were not directly involved in operating the laboratory equipment.** Most of the participants were high level officials who have limited technical knowledge of laboratories.
- **Staff turnover.** Before granting any international training for staff, a letter of commitment and plan to implement the newly acquired knowledge with detail activities and period of implementation must be signed between the training participant and the authority to avoid staff turnover before transferring their knowledge to their successors.
- **Stationary and mobile fuel laboratory equipment was very new and advanced technology**. This meant that it required follow-ups and continued capacity building from the vendor.
- **Access to reagents should be in place before acquiring the laboratory equipment**. As per the KII one of the reasons for not using the laboratory equipment were lack of reagents but this could be avoided if demand specification was done properly.
- **Limited access to calibration materials /chemicals**. Lack of knowledge on where to acquire the chemicals for laboratory test as a result both the stationary and mobile fuel laboratory equipment generate fictitious test.

Extent to which projects have properly identified and managed risks. The project design lacked adequate risk identification and mitigation mechanisms. The project failed to achieve its objective due to failure to take risks into account (e.g., procurement process took longer than expected, staffs transferred to another departments, etc..).

Lessons learned

Four key lessons from the project are highlighted:

- A key lesson from the project is the importance of trained procurement specialists for projects that involve procurement of goods.
- Identifying relevant staff for training to effectively utilise the laboratory equipment, selection criteria must be in place to be eligible for trainings. Trainees must be committed to staying with the institution that provides the training.
- The unutilized budget could have been used to train additional staff (laboratory staff) so that the mobile stationary and the equipment were used properly.
- Access to essential chemicals /materials needs to be identified for sustainable supply of the chemicals for laboratory consumption.

STRATEGIC SUPPORT FOR WATER MONITORING SYSTEMS

CRGE sector	Ministry of Water, Irrigation and Energy (MoWIE)
Regions	National
Timeframe	2014-17
Budget (project spent)	US$ 700,000

Highlights

- Hydrological data and information are vital for any planning and decision making in the water sector. In Ethiopia, there have been several small pilots for upgrading water monitoring systems, but there is no strategic framework for doing this in a more structured manner.
- The main objective of the project was to improve data generation, monitoring, processing, and analysis in the areas of water quantity and quality for both surface and groundwater resources to support the development and management of water resources and reduction of extreme events.
- The project developed a strategic plan for upgrading the monitoring system and installed 54 improved stations with automated instruments and telemetry system leading to improved surface and ground water database.

Context and background

In Ethiopia, a major challenge in responding to climate change is the lack of data and limited water data collection systems. MoWIE's Hydrology Directorate and the National Meteorological Agency are responsible for collecting water data and information, but the systems require strengthening to ensure that they can provide timely, reliable, and usable data to decision makers at all levels.

Hydrological data and information are vital for any planning and decision making in the water sector. However, in Ethiopia essential data and information crucial for rational planning is inadequate, inaccurate, and often not available. There are several small pilots for upgrading systems, but there is no strategic framework for doing this in a more structured manner. Thus, the importance of upgrading climate and hydrological information systems to generate a reliable, accurate and sustainable quality data will improve data generation, monitoring, processing, and analysis in the areas of water quantity, for both surface and groundwater resources that will support the development and management of water resources and reduction of extreme events.

Overview of FTI project

The project was implemented from 2014 to 2017 with main objective to improve data generation, monitoring, processing, and analysis in the areas of water quantity, quality for both surface and groundwater resources that will support the development and management of water resources and reduction of extreme events.

The project undertook several activities to achieve its objective mainly in developing strategic plan for upgrading the monitoring system based on the strategic plan and need assessment automated instruments and telemetry system were procured, in addition factory level trainings was delivered on telemetry equipment installation and data base system.

The four main outputs of the projects were:

1. Output 1: A clear, user-focussed strategic plan for upgrading the monitoring system;
2. Output 2: 50 improved stations with automated instruments and telemetry system;
3. Output 3: Improved Surface and Ground Water Database; and,
4. Output 4: Skilled staff able to operate and manage the monitoring system.

Key observations

Relevance

Extent to which activities were in line with the local needs, priorities, and demands. The project was strategically aligned to the Ethiopian's CRGE initiative, specifically strategic priority 5.1 on data systems for decision support – strengthening data systems to provide timely, reliable, and usable data to decision makers at all levels.

In 2014 there was 489 hydrological gauging stations across Ethiopia, which were mainly equipped with manual instruments. The MoWIE's Hydrology and Water Quality Directorate collects river flow data and groundwater variability through nine branch offices and 11 staff. The collected data is processed, analysed, stored, and disseminated to developers, academics, researchers, and other data users. This is a time-consuming process that can be prone to errors. Furthermore, the database was outdated and did not use modern technology (e.g., GIS). Strategic support for water monitoring enhanced the directorate's capacity by providing automated instruments and telemetry system to generate and disseminate real-time, reliable, and sound data for decision makers to give scientific decisions on water resource and development.

Extent of ownership and leadership in development of investment plans and projects. The project received adequate support from relevant stakeholders, including the CRGE Facility and the River Basins Authorities, in terms of developing strategic plan and preparing terms of reference for international procured equipment.

The design of the project has concisely constructed activities and outputs that are well linked to the planned objective, in addition the project document has clear outcome, outputs activities that the project aspires to achieve with associated risks, monitoring and evaluation framework with the expected results, indicators and means of verification. In addition, gender and safeguarding were considered in the design process.

Extent to which gender, safeguards and inclusion were considered in the design of activities. The project considered gender, safeguards, and inclusion in its design. The project investment plan identifies women and children as the most vulnerable group to disasters, and hence establishing this automatic data collection system enables to predict the extremes and provide information in advance. In addition, the project design assesses safeguarding measures stated under Proclamation 299/2002 and Regulation No. 1/2007 for the national environmental and safeguards requirements.

Efficiency

Extend to which activities and outputs were delivered according to plan and budget. The project completed the below major activities:

1. Strategic plan for upgrading data systems based on an assessment of the existing system and end user needs was developed;
2. 25 improved stations with automated instruments and telemetry system were delivered to hydrology and water quality directorate;
3. Factory level training was given for five staffs in Vienna, Austria;
4. 540 observers and community members were trained on the importance of telemetry system and the relevance of monitoring water pressure and quality;
5. One telemetry system was installed in Akaki Aba Samuel area; and,
6. Suitable and secured site selected for installation (Abay, Awash and Rift Valley.

KIIs with project stakeholders indicated that the project had a key visible gap, related to the need to consider knowledge transfer in training and capacity building activities, in the context of frequent restructuring and reshuffling of MoWIE staff.

Availability of M&E reporting, including measurable indicators, processes for collecting data, and feedback processes to facilitate decision making and learning. The validity of project design, in general, is found to be good, but it has some limitations. All the project indicators do not have baseline values which is necessarily crucial to see the changes of the interventions, and characterising these changes that the project aspires to achieve in the hierarchy of results.

Extent that arrangements permitted and facilitated effective participation and voice of different categories of stakeholders. The project has been implemented with well-organised coordination and management framework, appropriate institutional arrangements in federal and regional levels were set-up and found to be functional.

Effectiveness

Extent to which FTI activities achieved outcome level results. According to a qualitative assessment through KII the project did not achieve higher outcome-level results, despite the purchasing of 25 improved stations with automated instruments and telemetry system and related factory level training. Specifically, the project did not generate any data that informed decision making. The MoWIE's Hydrology and Water Quality Directorate is still using the manual method to populate climate and hydrological information.

Photo: Trained experts installing automated water level & water quality recorder Telemetry device in Koka

Sustainability

KIIs indicate that FTI project's model was appreciated by the government officials but higher-level results were constrained by internal and external challenges. Major factors influencing the achievement of the project outcomes include:

- **Staff reshuffling**. Three of the staff who took the factory level training on how to operate the telemetry system transferred to another department without capacitating their successor.
- **Theft/misuse of the telemetry system**. Awareness creation for local communities must be in place before installing the system. The evaluation found that one of the telemetry systems was demolished by locals due to misconception of the system. Moreover, it proved difficult to install the remaining 24 telemetry system due to security/theft; assessment of secured location for installations should be in place before procuring and installing the system.
- **Extent to which projects have properly identified and managed risks.** The project design lacked adequate risk identification and mitigation mechanisms. The project failed to achieve its objective due to failure to take risks into account, notably staff turnover and local community awareness in relation to the installation of the systems.

Lessons learned

A key lesson from the project is the need to have robust selection criteria for selecting staff for training and capacity building activities. Trainees must be committed to staying with the institution that provides the training.

OFF-STREET PARKING AS INSTRUMENT TO IMPROVE TRAFFIC FLOW AND EMISSION REDUCTION IN ADDIS ABABA CITY

CRGE sector	Ministry of Transport (MoT)
Regions	Addis Ababa
Timeframe	01/04/2014 – 02/06/2015
Budget (project spent)	US$ 780,000.00

Highlights

- Addis Ababa wants to reduce CO2 emissions through increased vehicle efficiency. Reducing traffic congestion is considered a win-win goal, achieving both environmental impacts and contributing to economic growth.
- The project resulted in the successful construction of an innovative smart parking tower, a new technology to Ethiopia, which is available for demonstration to public officials, the private sector and other stakeholders.
- The construction of the facility has attracted attention for development of a number of further sites for public parking, as well as from a number of private sector actors who are considering constructing similar facilities in a different context (e.g., for hotels and offices). Such replication has the potential to stimulate development of a mature market for construction, spare parts and maintenance, which would be key to scaling up and sustainability .

Context and background

Addis Ababa is the hub and gateway of Ethiopian economy. However, it faces a multitude of problems associated with traffic volume increase, congestion, air pollution and growing traffic accidents. The municipality is in the process of implementing a strategy to reduce congestion, by which it is expected CO_2 emissions will decrease through increased vehicle efficiency. Reducing traffic congestion was considered a win-win goal, achieving both environmental impacts and contributing to economic growth.

The project took place in a context of an evolving transport policy and strategy in Addis Ababa, and aimed to have the additional function of bringing different stakeholders together on a specific area of planning to encourage them to operate in an integrated and holistic manner. In this case the specific need was a lack of off-street side parking, and lack of a framework for identification of appropriate sites for off-street parking. Key project activities included in the project design were identification of locations, engagement of stakeholders, construction of off-street parking solution, and developing PPP guidelines and terms to engage private investors.

The main implementing organisations were the Addis Ababa Transport Bureau, the MoT and the City Administration, although after the project started the structure and governance of the transport sector bodies underwent changes, and after the project kicked off management of the project was passed to the Traffic Management Bureau.

Overview of FTI project

The central activity of the project was the construction of a smart parking tower, using new imported technology. The FTI project funded the construction of a tower in the Megenagna area of Addis Ababa, a heavily congested area of the city, as part of a wider programme of constructing such facilities. The

Megenagna tower was successfully completed shortly after the end of the FTI funding period,[30] and the site was subsequently operational for two years. However, in the period since, difficulties in procuring a maintenance provider have led to the facility being closed, although a procurement process is currently ongoing as of April 2021, and a provider expected shortly to be in place.

The construction of the site took place in the context of a wider programme of work, co-financed from public funds to:[31]

1. Identify city-wide congested roads and prepare a preliminary area/market feasibility study;
2. Prepare city-wide maps showing available parking space and their relevance in addressing the congestion problem;
3. Demonstrate and create awareness of the relevance of off-street parking through this and other pilot constructions, and to engage other development partners for replication; and
4. Prepare PPP guidelines that will scale up the project elsewhere in Addis Ababa.

Key observations

Relevance

Extent to which activities were in line with policy priorities. The project aimed to contribute to the GTP by developing and improving road transport infrastructure. As a pilot project, construction of the smart parking facility was intended to demonstrate proof of concept to the private sector in particular, as well as provide a focus for the development of policy on engaging with the private sector. The project was also stated in CRGE's Decision Note to have relevance to the Green Economy and Climate Resilience strategies. In particular, it addresses the potential to reduce GHG emissions caused by traffic congestion.[32]

Extent of ownership and leadership in development of investment plans and project. The proposal did not contain a specific capacity building component for the implementing agencies or partners, and so cannot be seen as specifically aligned with the broader enabling agenda subsequently elaborated in the CRGE M&E Manual. In general, interviewees were less familiar with the context of CRGE's wider agenda, perhaps owing principally to the restructuring that had occurred in the sector since initial design. Key personnel involved in the project design and implementation of the FTI project were also not available for interview.

Extent to which activities were in line with the local needs, priorities, and demands.

Interviewees stated that the FTI project and experience of the wider programme of work was instrumental in developing the Non-Motorised Transport (NMT) Strategy, as well as the evolution of a wider holistic approach, including public transport, a road safety strategy, limiting importation of used vehicles and promoting the use of electric vehicles.

Due to a lack of interviews with key personnel, it was however difficult to ascertain how the proposal was developed, and what prioritisation activities may have taken place to select this intervention as most appropriate and effective in terms of environmental impacts, or how it related to long term strategic planning. In the LTS International VfM report compiled at the time the project was under implementation, questions were raised related to the rationale of the design and whether the scope of the project was realistic:

> *[It is not clear] why bespoke smart parking towers were decided on, rather than other types of parking, or better utilisation of existing spaces that might be available for parking? In addition, in the case of the latter project,*

[30] FTI Final Report

[31] FTI Project Proposal.

[32] Decision Note

> *FTI funds were insufficient to pay for even one of the seven units that were proposed, indicating inadequate planning"*[33].

Extent to which gender, safeguards and inclusion were considered in the design and implementation of activities. Gender was considered to a limited extent in the initial design, the project proposal stating that the FTI project would address gender equality through providing safety for women through off-road parking, and through employing women in the parking facility. It was reported through interviews that that 50 percent of the employees of the SME currently operating the site are female (9 out of 18).

Efficiency

Extent to which activities and outputs were delivered according to plan and budget. The project proposal listed four expected outputs, which appear to have been partly achieved by the end of the FTI funding period. However, due to a lack of available detailed output-level reporting and the apparent incorporation of the FTI project within a wider programme of work, it has been difficult to ascertain the timing of their completion, or their attribution to the FTI funding specifically.

The four intended outputs were:

- **Output 1:** Engage 15 major stakeholders and 60-70 participants who can have significant role in off-street parking/traffic flow improvement activities; According to the VfM report the stakeholders engagement was conducted according to the project plan, although reporting does not contain further detail. Engagement can also be implicitly assumed to have taken place, although to what degree this was formalised or guided by strategy is unclear.
- **Output 2:** Map city-wide parking plan that spots 100 possible parking area in all 10 sub-cities for about 20,000 cars; identify traffic flow problems in major artery roads, commercial areas and LRT/BRT terminal spots; conduct preliminary market analysis / area assessment; Some identification activities appear to have taken place, as evidenced by the change of site selection; mapping activities were however not formally reported in the final report.
- **Output 3:** Prepare PPP Guideline and agreement document; the final report states that this remained under preparation at the time of formal project closure. From our interviews it was related that a PPP strategy was subsequently finalised by Addis Ababa University and presented to the mayor's office, and adopted through a directive. However, this PPP strategy remains to be aligned with the national PPP framework, which the MoF (Ministry of Finance) is currently working on. It is unclear the degree to which this activity can be attributed to FTI project funding.
- **Output 4:** Provide a total parking capacity of 150 around Mexico Square for an estimated 1200 car owners, assuming each car will stay for an hour. The location was changed, due to the lack of availability of the site, to Megenagna, and the capacity reduced to 90. The site construction was reported as 94 percent complete in the final report. Although subsequently completed, the facility is however not currently operational, due to the lack of a contract for technical maintenance.

Output-level achievements need to be understood in the context that, the FTI project was part of an ambitious plan to construct seven smart parking facilities in Addis Ababa. The VfM report notes that at the time the FTI funding was considered a contribution to a wider pool of funding used to develop smart parking, with only USD 780,000 (7 percent) of funding from FTI. The total cost was USD 12.7 million. Interviewees noted, however, that due to the high cost of the structure, the FTI funding was insufficient to cover for the single parking facility it was expected in the proposal to wholly finance (alongside other activities). The remainder of costs was financed by the government. Due to a lack of available financial reporting or availability of key personnel for interview, it is difficult to know to what extent the FTI project was managed and monitored as a distinctly from the project or one element of a wider program or work.

The initial budget allocation also did not include funding for maintenance and spare parts. Financing for this may however have been implicitly expected to be assumed by the wider programme Procurement for both maintenance and spare parts is currently being pursued by the by the Traffic Management Bureau under a 5-year contract. This is, however, a lengthy process following the

[33] LTS VfM report

government procurement strategy guidelines, and previous attempts at procurement have resulted in unacceptably high prices being quoted. Some interviewees suggest that the procurement of a maintenance service and of spare parts should be separated.

Another inefficiency reported by interviewees was a lack of foreign exchange currency. Construction of the facility required importation of machinery and a foreign contractor for the installation. Due to the insufficiency of funds, obtaining co-financing in forex from the city administration was reported to be particularly challenging, resulting in some delays in the project implementation.

Availability of M&E reporting, including measurable indicators, processes for collecting data, and feedback processes to facilitate decision making and learning. Due to lack of available detailed reporting, there is little evidence available that systematic M&E took place during lifetime of project. As construction project was the principal activity, this may not have been a critical blockage to the efficiency in achieving the principal output. However, the lack of an apparatus for measuring progress against other outputs, such as stakeholder engagement, may have resulted in a lack of focus on ensuring that outputs are translated to the wider outcome and impacts stated in the proposal .

Photos from site visit in Addis Ababa.

Effectiveness

Extent to which activities achieved the intended objectives. The project has potential to partially achieve outcome-level targets. The target set out in the project proposal was to reduce the congestion by providing a total parking capacity, and thereby to decrease CO_2 emissions at peak hours by 20 percent (although the baseline and geographical scope of this emission reduction is not clear). The site was successfully operational for two years immediately following the construction, and is expected to be operational again in 2021, after a hiatus where a maintenance contractor has not been in place.

Interviewees have suggested that some of the maintenance tasks, such as electro-mechanical work, would be potentially within the capability of the current site operators who operate multiple parking facilities and have performed similar work previously. It is possible therefore that a component of skill transfer from technical operators and constructors would be useful, and this could considered in the design of other programmes to ensure effective (and sustained) achievement of outcomes.

There was also a scaling down of potential outcome-level results, through reduction of the capacity of the facility from 150 to 90 cars. Interviews with the operators suggest that the average period of parking at the site is likely to be two hours, which given a 12-hour operating period of the facility suggests a maximum daily service to 540 car owners, less than 50% of the number expected in the proposal. Given the apparent insufficiency of funds, scaling down can however be considered an appropriate and effective response to inadequate budgeting at design stage.

Outcome-level results can also be considered in the context of their wider contribution to municipal strategies. The project proposal notes that a reduction in street parking is expected to contribute to improving the city traffic flow and creating enabling conditions for the ongoing Bus Rapid Transit (BRT) programme. It is evident from the site visit that the location of the facility was well-selected in terms of need and demand. Traffic in the area is noticeably congested and the ground level car-park adjoining the smart parking facility is full to capacity at peak hours. However, even when fully functional it is clear that the facility itself would not absorb demand for parking sufficiently to have a significant effect in reducing on-street parking and traffic congestion. Such reduction relies on a whole entire traffic lane being cleared. The proposal acknowledges this and notes the necessity of enforcement of rules against on-street parking by police. Engagement to advocate for implementation of such rules does not however appear to have taken place, which would be critical to successful achievement the outcome of reducing congestion.

In general, there has been little evidence available of wider engagement with other institutional and operational stakeholders, which could have helped to translate outputs to environmental outcomes and impact more effectively. As well as the lack of detailed reporting of such activities, this may reflect the restructuring of relevant transport agencies and difficulty of access to personnel involved in the implementation of the project.

Impact

Most identifiable impact of the FTI project. No major direct environmental impacts can currently be reported, but some observations can however be made regarding the scale of expected impact and the likelihood of achievement:

- **Reduction of GHG emissions (CRGE programme-level impact indicator)[34]**: The final FTI report notes that an assessment undertaken in 2012 estimates that the average car in the city emits an additional 0.07 metric tonnes of CO_2 due to traffic congestion. It further states that MRV activities were planned to take place after the site was operational.[35] However, if such monitoring activities took place in the two-year period that the site was operational, the results (and methodology) have not available for assessment. In order to ass a reduction of GHG emissions through increased traffic flow it would also be necessary to verify intermediary steps in the results chain leading to impact, i.e. a reduction in on-street parking in the vicinity, resulting in an extra lane of traffic being fully freed for traffic. As noted in the Effectiveness section, the clearing of a whole traffic lane of parked cars in its entirety would also almost certainly also require legal enforcement. Interviewees acknowledge that without such supplementary activities the, the contribution of the smart parking facilities to GHG reduction is limited. The Traffic Management Bureau suggests that the project's main potential contribution to this impact should be considered in the context of the wider Non-Motorised Transport strategy and other interventions undertaken by the municipal agencies. It is also stated in the project proposal that reduction of traffic congestion (and potential for creating dedicated lanes) through this and other initiatives would create a more conducive environment for the further roll-out of public transport and encouragement of cycling, through enabling dedicated lanes to be designated for this purpose. In this view, the success of projects targeting GHG emission reduction should be considered holistically within this wider programme, and individual projects should be designed, selected and assessed on the basis of their contribution to this strategy (see Relevance and Sustainability sections for more detail).

[34] 'Total national GHG emission savings (MT) – disaggregated by sector' (CRGE M&E Plan)

[35] Final FTI Consolidated report

- **Job Creation:** The facilities are expected to make a contribution to job creation. The operating SME currently employs 18 members, of which 9 are women, and provides services across several sites, including the parking lot in which the smart parking facility is located.

The Addis Ababa Traffic Management Bureau stated that the main identifiable impact of the project was not in its environmental impacts, but in awareness-raising and lessons learned regarding possibilities and challenges relating to smart parking, as well as its catalysing effect for the wider municipal strategy. Subsequently to the project, the Non-Motorised Transport strategy was elaborated, with other interventions being planned such as promotion of public transport, car-free days, encouragement of electric cars and disincentivising older cars through higher taxes. Traffic congestion reduction is seen as crucial in enabling many of these approaches, and the smart parking pilot has been said to have provided lessons in this regard, as well as being a flagship project drawing attention to leverage further funding from the federal government.[36]

Sustainability

Extent to which results and impacts have been sustained. The immediate need to ensure sustainability of site-level outcomes is for the procurement of long term and economical maintenance services. The Traffic Management Bureau has stated that the principal barrier is the need to comply with a lengthy procurement process. The limited number of potential suppliers can also itself be considered a risk to sustainability; in the longer term, a mature market of domestic suppliers would both reduce the cost of maintenance through competitive pressure (cited in interviews as a problem in previous attempted procurements) and improve resilience of the system through diversity of suppliers.

A significant problem with the current long-term maintenance contracts from the suppliers' perspective is the difficulty of pre-financing the requirement to lay in stock spare materials for a long duration, which represents a significant outlay for smaller companies. This suggests that a wider consultation of the market may also be helpful before going to tender, as well as any appropriate restructuring of the contracting terms to attract the widest possible pool of bidders.

Factors driving site-level sustainability are the demand for parking at the site (evident from the site visit), continued commitment to the project from the Traffic Management Bureau, as well as the high quality of the structure itself, for which a 20-year guarantee was obtained from the construction company.[37]

Extent of active participation and support of projects by stakeholders. The smart parking facility has already been duplicated in the Mercato area, and is part of a much larger programme of work to construct more parking in Addis Ababa. Interviewees also stated that the project is expected to leverage further public funds for smart parking solutions, and there has been evidence of political and administrative buy-in, through visits from the former mayor of Addis Ababa and the allocation of funding for plans for further facilities.[38]

In the long-term however, it is understood by the Traffic Management Bureau that private sector take-up will be crucial to scaling. The principal barriers to this are currently profitability and risk. One interviewee estimated that with the current revenue model, Return on Investment (ROI) would take at least eight years, compared to a period of around three years for general property development. To some extent well-structured public-private partnerships, currently being explored by the Traffic Management Bureau, may help to mitigate thus barriers to investment, as well as to reduce risk for private sector partners.

There is also already evidence of interest from the private sector. Several companies, including three hotels as well commercial office developers, have visited the site and approached operators with queries regarding construction and operation. It is possible that these bespoke uses of smart parking (as a prestige offering to customers in locations where space is limited) may be more financially viable than its use in public parking sites (with limited revenues). If successful, such private initiatives would

[36] Also noted in VfM Report, although the amount is not specified.

[37] Source: interviews.

[38] VfM Report

also help to develop the domestic market for maintenance and spare parts, lowering costs through competition and thereby increasing the likelihood of sustainability.

Lessons learned

Four key lessons from the project are highlighted:

- The project was reported in the VfM Study to have been insufficiently budgeted to achieve the FTI-specific outputs and outcomes. As the FTI project was part of a larger programme of work, the municipality could absorb these costs for the construction of the site. However, this appears to had a significant effect on curtailing some key project activities, especially the engagement activities designed to support the achievement of higher-level outcome and impact level results. It is important for CRGE projects that such activities remain prioritised, and a focus is retained on translating outputs and outcomes to environmental impact.
- For projects where the major component is capital expenditure, ongoing costs (i.e., O&M) should be factored into the project budget and design.
- In terms of impact level results, it is not evident that this project and approach represents effective prioritisation or value for money. In the case of this project the pathway to significant impact on GHG emission reduction is best understood through the ways in which alleviating traffic congestion could enable other initiatives, notably those in the Non-Motorised Transport Plan (NMT), to be more effective. A thorough cost-effectiveness analysis and modelling of the various enabling factors for the NMT plan may be useful in prioritising future interventions and allocating funding.
- Dependency on imported equipment needs to be considered a major factor in assessing the sustainability of projects.

6 Strategic evaluation findings

The CRGE Facility mobilised US$ 18.63 million for 27 FTI projects, making FTI one of Ethiopia's largest climate initiatives. FTI projects have contributed towards mitigating GHG emissions, boosting renewable energy generation capacity and energy efficiency, improving forest management, strengthening land and water resources management, and increasing rural incomes and creating green jobs.

The FTI projects have done so with **genuine CRGE Facility leadership and integration with national policies and priorities** while also spurring greater cooperation between federal implementing entities (IEs) and region/woreda level departments and bureaus.

This FTI process has also provided **significant learning opportunities to inform climate programming** and **leveraging additional climate funding** through more efficient use of GoE resources and the attraction of additional resources into the CRGE Facility from the GCF, AF and other funds.

FTI projects employed a wide range of approaches, amongst others, technical assistance, institutional strengthening and capacity building at national, regional and woreda levels, pilots and physical interventions, and climate/hydrological data and information systems for use in decision-making.

This section presents strategic evaluation findings of the FTI projects, draws out the lessons which can be learned, and suggests how these lessons might improve the results of other interventions of a similar nature and with similar objectives.

The key questions which the evaluation has sought to answer are:

DAC standard	Main evaluation questions
Relevance	To what extent were the objectives and design of FTI projects aligned with national green growth and resilience priorities and concerns, including the Government of Ethiopia's ability to deliver its CRGE vision and strategy?
Efficiency	Have the FTI projects been delivered according to plan and on budget?
Effectiveness	What tangible outcomes (intended and unintended) have the FTI projects achieved?
Impact	What is the most identifiable impact of FTI projects and how are they perceived by other executing agencies and partners?
Sustainability	To what extent have the results and impacts of FTI projects been sustained?

Based on the portfolio analysis, case studies and the cross-cutting analysis, the evaluation makes the following conclusions on the main evaluation questions. This chapter is not a comprehensive summary of the evaluation, but gathers major actionable findings with recommendations for the CRGE Facility.

6.1 Relevance

Extent to which activities were in line with the local needs, priorities, and demands. More than three years since the completion of the FTI projects, FTI objectives continue to be highly relevant to Ethiopia's needs, priorities, and demands. FTI objectives and projects have been highly relevant to national climate challenges, including those identified by the GTP II, HGER 2021-2030, CRGE Strategy, Climate Resilience strategies and the NDC. More broadly, FTI projects have also been relevant to international development and climate agendas, including the achievement of the Sustainable Development Goals (SDGs) for 2030 and the Paris Agreement.

At the region and woreda level, KIIs and site visits suggest that FTI activities have been highly relevant to the local needs and priorities. In all 9 FTI projects covered in case studies, government counterparts, executing entities and beneficiaries indicated that they consider the projects relevant and were involved in the design process.

Extent to which gender, safeguards and inclusion were considered in the design of activities. The CRGE Facility has responded to recommendations from the CHIP evaluation, and there had been a visible increase in environmental and social safeguards (ESS) systems and procedures in FTI activities as they progressed. There is evidence of increasing collaboration and demand for gender expertise, as the understanding and value of ESS has increased within the CRGE Facility and amongst implementing and executing agencies. Administratively, the M&E Systems Manual and a new screening process for safeguarding has ensured better consideration of these topics during the project planning and implementation. The safeguards screening was applied retrospectively and ensured better consideration of these topics during the project implementation, and alignment of FTI reporting with the CRGE Facility's new systems. However, the process would benefit further from more comprehensive incorporation of ESS components, notably on gender, in project design and M&E to ensure consistency and enhance visibility during activity implementation.

6.2 Efficiency

The governance and management structure of the CRGE Facility has evolved since the period of execution of the FTI projects. Overall, the evaluation finds that FTI projects were well-managed. The CRGE Facility was an effective governing and managing body that is fulfilling its key functions, including (i) providing strategic direction for CRGE sector action plans and investment proposals; (ii) attracting and securing funding for CRGE initiatives; (iii) monitoring, evaluating, verifying and reporting for CRGE Facility-funded initiatives; and (iv) providing fiduciary assurance to the providers of finance.

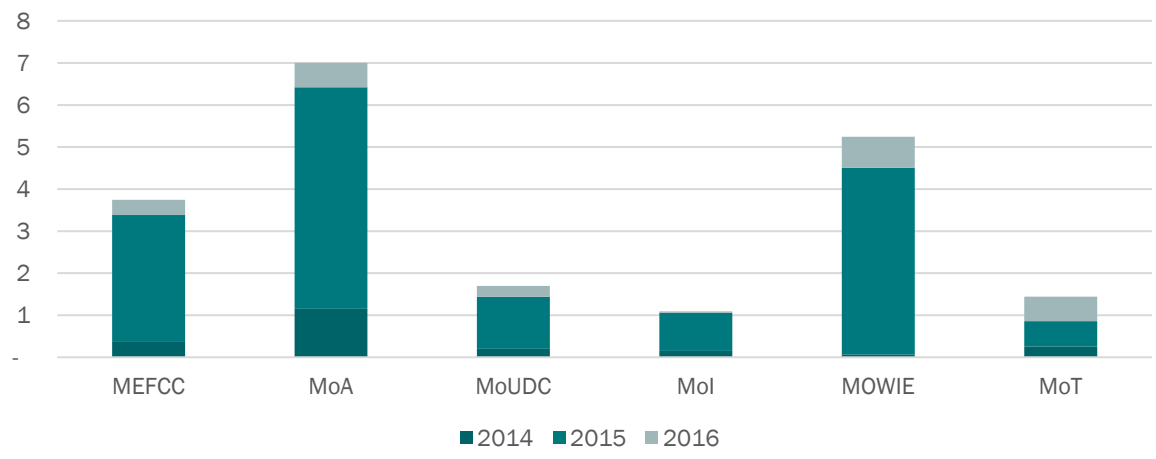
This conclusion is based upon the data and evidence which the evaluation team has been able to obtain from the FTI project management database, documentary review and interviews with stakeholders and beneficiaries.

Extent to which FTI activities and outputs were delivered according to plan and budget. Many FTI proposals do not describe planned outputs and the level of detail of reporting was often inconsistent, and thus the evaluation was limited in its ability to assess FTI delivery against plan. Limited instances of non-completion of expected outputs were observed in the MoWIE solar power for water supply and irrigation project in the Gambella and Benishangul regions. However, on the whole, the evaluation found that outputs were successfully delivered and were reasonable in scope and scale given the size of the projects.

In general terms, feedback through both: (i) interviews of beneficiaries and stakeholders carried out during the field visits; and (ii) the wider client consultation, was positive in terms of the timeliness of inputs and outputs. The vast majority of those interviewed indicated that FTI projects had been efficient and effective in delivering outputs, and that activities and outputs met expectations.

Administrative efficiency. Figure 6 presents actual disbursement to funded FTI projects. By 2016, total disbursement was close to anticipated levels of US$ 18 million. The years 2014 and 2016 saw smaller disbursements compared to 2015, which is to be expected given the FTI project planning and delivery cycle.

Figure 6: Disbursement by year (totals and per CRGE sector in US$)

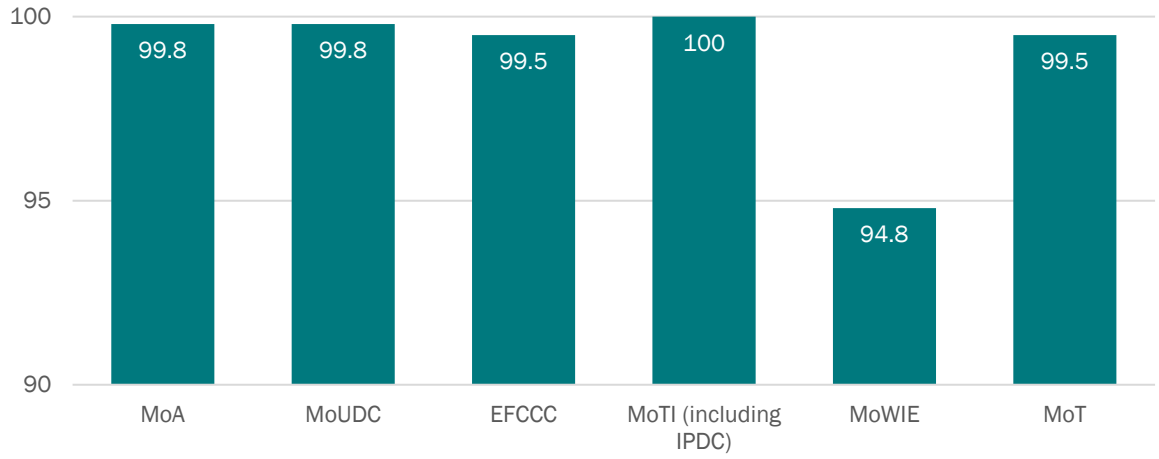


Financial management and reporting against the funds disbursed for the FTI projects followed the CRGE Facility Operational Manual. During the initial phases of the FTI project implementation, the CRGE Facility disbursed project funds through the implementing entities (CRGE sectors) and vertically to the regions and later to the woreda level executing agencies. However, the lack of evidence and supporting documents at the woreda level against the funds that were disbursed by the CRGE Facility called for revisiting its fund disbursement channel in its manual. Facing these challenges, the CRGE Facility revised its manual and revisited its fund disbursement channel from what used to be through the CRGE sectors to Channel 1. This change improved the CRGE's Facilities ability to efficiently manage funds, increasing the quality of the financial reports it was receiving and the pace of project implementation on the ground as the process enabled quicker release the required resources.

FTI's efficiency or cost-effectiveness in implementing individual projects cannot be fully assessed due to lack of sufficient data and comparable benchmarks. These challenges are compounded at the output and outcome level, where it is not straightforward to assess the financial resources spent to achieve each output or outcome. As a result, cost-effectiveness of FTI projects by CRGE sector or region area cannot be properly assessed.

Still, this evaluation attempts to make some quantitative assessment of cost-effectiveness. Across all FTI projects, actual disbursements have averaged about 98 percent of allocated amounts, suggesting some efficiencies. Average disbursements per project were slightly less for MoWIE (94.5 percent). However, limited information is available to inform an interpretation of these statistics.

Figure 7: Disbursement and settlement by CRGE sector (% settlement)



Source: CRGE Facility. Final FTIs consolidated report.

Availability of M&E reporting, including measurable indicators, processes for collecting data, and feedback processes to facilitate decision making and learning. FTI reporting is of mixed quality. Some FTI proposals do not describe expected outputs or outcomes in terms that are conducive for reporting against results framework targets. There is also generally a lack of available detailed financial reporting at the project levels and not all CRGE sectors disaggregated beneficiary data by gender. Generally, MoA, MoUDH, and EFCCC provided the most comprehensive reports.

6.3 Effectiveness

Broad outcome areas where FTI projects achieved significant results. The effectiveness of the FTI projects relates to how well the inputs and outputs are contributing towards the achievement of outcomes. FTI projects reflected a broad portfolio of activities, which have been largely effective in achieving their objectives. For most projects, effectiveness has benefited from effective participation and voice of different categories of stakeholders in development of investment plans and projects, which has helped create ownership; replicable/scalable approaches; and the capture and application of lessons learned. FTI projects have been most successful in the MoA, MoUDC, EFCCC CRGE sectors, also noting the success of the MoWIE solar power for water supply and irrigation FTI project.

It is acknowledged that some avenues of work did not achieve the expected results. Projects that piloted new ideas and concepts, such as MoT's off-street parking project, MoTI's MRV system for selected industries and MoWIE's support for petroleum downstream operations and for water monitoring systems have suffered from a lack of familiarity and potentially too high expectations. For these FTI projects, greater consideration and resources should have been given, and the assignment of appropriate targets for outcome achievement.

The evidence base for this assessment is reasonably strong since it is derived from a variety of sources including KIIs and an examination of the robustness of the overall CRGE results framework (strategic outcomes map), FTI quarterly reports, the CHIP independent evaluation, and the FTI closure reports.

The table below provides the indicative broad outcome areas where FTI projects included in the case study analysis in the evaluation achieved significant results per CRGE sector.

Table 7 Broad outcome areas where FTI projects achieved significant results

CRGE sector	Outcomes
Ministry of Agriculture (MoA)	Improved crop and livestock production practices through adoption of climate smart agriculture, crop diversification and mixed farming for higher food security and farmer income while reducing emissions
Ministry of Urban Development and Construction (MoUDC)	Constructed a functioning compost site for Hawassa and its outputs have successfully been used to improve the city's greenery. Moreover, developed a recreational park in Adama and raised awareness of the potential for urban greening to contribute to mitigating urban pollution and GHG emissions
Environment, Forests and Climate Change Commission (EFCCC)	Rehabilitated open urban/peri-urban spaces and degraded lands, leading to enhanced green environmental condition and thereby ensuring additional carbon sequestration
Ministry of Water, Irrigation and Energy (MoWIE)	Replaced 42 diesel powered water pumping systems with solar powered systems in four regional states (Oromia, Amhara, SNNP and Tigray) and provided sustainable water to the community in environmentally friendly manner with lower lifecycle costs
Ministry of Trade and Industry (MoTI)	Helped in identifying energy inefficiencies in five manufacturing sub-sectors (cement, textile, and leather, steel and metal, food and pharmaceutical) and proposed systems and technologies to reduce GHG emissions
Ministry of Transport (MoT)	Demonstrated off-street parking solutions as instrument to improve traffic flow and emission reduction in Addis Ababa city

6.4 Impact

Most identifiable impact of FTI projects. Overall, FTI projects played an important role in incrementally contributing towards Ethiopia's CRGE vision of becoming a middle-income country by 2025, through economic growth that is resilient to climate change and results in no increase in carbon emissions, whether directly through tangible outcomes, or indirectly by opening the door for other interventions to support longer term impacts.

Mitigation and adaptation benefits of FTI projects were not being measured systematically. There is insufficient data available to estimate emissions avoided or reduced for each FTI project. Several projects were small-scale pilots unlikely to yield large GHG reductions, and in some cases the baseline emissions were already low. MoA and EFCCC sectors are the most likely source of measurable GHG reductions.

The table below reflects the achievements of the 27 FTI projects summarised by the evaluation team from FTI reports.

Table 10: Summary table of reported results

Indicator	MoA	MoUDC	EFCCC	MoTI/IPDC	MoWIE	MoT
Direct beneficiaries	T: 15,375 R: 33,083 W: 37%	T: 1,621 R: 1,994 W: 53%	T: 16,122 R: 31,620 W: 38%	T: 100 R: 740 W: 61%	T: 147,000 R: 206,600 W: 50%	T: 91 R: 377 -
Rehabilitated land (Ha)	T: 48,031 R: 4,419	T: 34 R: 14.16	T: 12,580 R: 7,606	T: 34 R: 9	T: 180 R: 35	-
Species planted	-	T: 51,667 R: 70,547	T: 7.3 million R: 9.3 million	-	-	-
GHG emission reduction (tCO_2)	-	-	-	-	T: 1,233 R: 2,289	-

Key: T = Target; R = Result; W = Women

For more impact, similar projects in future could give more critical attention to the robustness of the causal chain toward impact, and especially the enabling environment and replication mechanisms. The CRGE Facility could adopt an operational definition of transformational change that would focus on further incentivising multi-sector programmatic approaches. It is also worth noting the role that wider policy and regulatory reforms can play in supporting investment impacts. These approaches and considerations are likely to also have relevance for the GCF.

6.5 Sustainability

Extent to which results and impacts of FTI projects have been sustained. Sustainability of FTI interventions and longer-term impacts, particularly a contribution to GHG emissions and resilience building, are particular challenges. The FTI projects were short-lived projects that were quickly implemented to kick start the functioning of the CRGE Facility. There is evidence from KIIs with CRGE Facility personnel and wider stakeholders that sustainability has been considered in all of the FTI projects. However, some FTI projects have dealt with it more effectively than others.

Most MoA, MoUDC, EFCCC, MoWIE FTI projects have sustained results. Within a broader context, the majority of FTI projects led to sustainable results; either, directly through tangible outcomes, or indirectly, by laying the groundwork or opening the door for other interventions to achieve the impact. However, achievement of higher-level results and sustainability of MoT and MoTI projects were constrained by internal and external challenges (notably staff turnover and limited consideration of the sector political economy).

Overall, the case study analysis shows that the FTI projects are more likely to sustain results when they ensure strong sector ownership, by integrating the projects into the regular programming of the executing entities, using appropriate technologies and approaches and considering full life-cycle costs, and when community participation is institutionalised as a result of broad-based participation of stakeholders, including CSOs/CBOs, at the local levels (region/woreda) from project conceptualisation and design all the way to implementation.

7 Recommendations

The evaluation makes the following recommendations:

Recommendation #1: Strengthen resource mobilisation approaches to promote access to climate finance at scale

Significantly more investments will be required if CRGE Strategy goals are to be met. Accordingly, the role and resource requirements for the CRGE Facility to support these developments will increase. Resource mobilisation needs to be scaled up and best practices from the FTI process needs to be replicated and implemented on the ground. The accreditation upgrading application to the GCF is particularly relevant in this regard.

Both public and private flows are indispensable elements of climate finance. The CRGE Facility can build on its grant management capabilities to increase the portfolio of windows through which it can be accredited for additional funding spectrum. This will enable the CRGE Facility to also work with the private sector through the Executing Entities and diversify its stakeholder engagement channels and reach. In parallel, the CRGE Facility can further increase the concessionally of its pipeline through domestic financing, by scaling up public funding at federal, region, woreda and kebele levels, and attracting private sector climate investments by creating market-based mechanisms to incentivise private sector investments as well as involvement of civil society and local communities in mitigation and adaptation actions.

Recommendation #2: Continue to support multi-sector programmatic approaches to support a more strategic and results-oriented way for delivering climate finance

Drawing on lessons from the FTI process, over the years the CRGE Facility has supported and incentivised the adoption of a more programmatic approach to climate change interventions in order minimise transaction costs and duplication associated with the original sectoral approach of the CRGE Strategy. All case studies suggested that activities that are linked to or consider the work of other CRGE sectors and donor initiatives and programmes are more likely to have strong stakeholder support, show better potential for contributing to results at-scale, and achieve leverage or influence. Recent projects initiated by the CRGE Facility have a programmatic foundation in their setup and address climate change in a more holistic and integrated manner. This marks a considerable shift from the sectoral approach the CRGE Facility had adopted in the FTI projects. The CRGE Facility is well positioned to further promote multi-sector programmatic approaches because of its mandate, and increase its impact.

Recommendation #3: Continue to support operationalisation of the CRGE Facility's M&E framework and Results Based Management (RBM) processes to improve project and programme delivery and strengthen results management and accountability

The results framework is a major driver of performance and reporting – it is important to get this right. A challenge for this evaluation was incomplete documentation of FTI activities and results. Project proposals often lacked clear definition of expected higher-level results (outcomes), financial records at FTI project level were missing, and in some cases, it was difficult to track down progress and annual reports.

There needs to be better definition and detail in defining the project and programme results chain – delineating outputs which are directly within the CRGE Facility's and implementing entities' control. To keep the GHG emissions reduction and resilience aspirations of the CRGE sectors, then the project design and investment plans need to be clearer about the mechanisms for measuring outcomes and impacts and the way in which the projects intend to ensure that it remains on track towards these highest-level objectives. Moreover, to facilitate improved results management the CRGE Facility should double down on improving documentation of activities and results. The FTI process significantly influenced bringing M&E and Results Based Management System into CRGE Facility's

management and planning processes. The evaluation also supports CRGE Facility's adoption of the new Results Based Management System processes.

Recommendation #4: Continue to support the refinement and operationalisation of detailed Measurement, Reporting, and Verification (MRV) of projects and programmes to allow for measurement of GHG mitigation impacts and co-benefits

Mitigation benefits or co-benefits of FTI projects were not being measured systematically. There was insufficient data available to estimate emissions avoided or reduced for each FTI project. At present, only the MoA and EFCCC sectors have developed MRV systems, and the GoE does not have a readily available consolidated database to track and record detailed MRV data across CRGE sectors. This is an important gap to fill for the country to track and report on its GHG emission reduction/abetment obligations under the Paris Agreement and report progress on its NDC. As part of its mandate and role, the CRGE Facility will need to deploy a comprehensive information and knowledge management system to track GHG emissions across sectors.

Recommendation #5: Continue to support the refinement and operationalisation of environmental and social safeguards (ESS) systems and procedures

The FTI projects began with limited ESS focus, but attention to ESS and gender issues increased over time. KIIs and fieldwork for the evaluation showed some risk to follow-through in implementation. The ESS process would benefit further from more comprehensive incorporation of ESS components, notably on gender, in project design and M&E to ensure consistency and enhance visibility during activity implementation. There are opportunities for CRGE sectors to integrate transformative work on gender equality into their CRGE activities. Stronger links to specialist gender expertise during project design and project M&E would be valuable. Awareness and systems for safeguarding have improved since the completion of the FTI projects. However, there is still a need to strengthen their operationalisation and generate lessons learned in their application.

Recommendation #6: Consider stronger private sector involvement role in climate change mitigation and adaptation projects and programmes

The private sector could be an important source of both technical expertise and finance for climate change interventions. There is a need for clearer guidance that addresses enabling conditions for the private sector to engage and contribute to the objectives of the CRGE Strategy.

A private sector engagement strategy for the CRGE Facility has been developed since the completion of the FTI projects. The CRGE Facility is currently working towards operationalising its strategy and streamlining private sector mobilisation and engagement approaches with the GCF requirements. The case study analysis showed that several FTI projects sought private sector participation. The CHIP evaluation had identified potential opportunities to improve understanding of how the CRGE Facility and implementing entities could best catalyse private sector engagement.

Table 10: Opportunities for greater private sector involvement

CRGE sector	FTI model	Opportunities for greater private sector involvement
MoA	GoE delivery of all inputs; management of loans through farmer cooperatives.	Consider involvement of microfinance in loan management and private sector in input supply (vouchers, input fairs). Establishment of local service providers, such as fodder supply, traction services. Support to co-ops on marketing.
MoUDC	Mixed public vs private approaches to solid waste management	Learn from these examples and study level of GoE subsidy required,

		sustainability and quality of services under different models. Consider PPP and market-based approaches to urban service delivery.
EFCCC	GoE management of nurseries and reforestation through direct hire of casual labour.	Consider performance-based payments to private suppliers of nurseries and tree planting. Bonus payments for post 1-year survival rate can incentivise survival.
MoWIE	GoE delivers solar technologies for free or via a revolving loan system.	Development of smart subsidy package or results-based payment approach to incentivise companies to sell / distribute household solar technologies in remote areas. GoE plays quality assurance / measurement role.

Source: adapted from LTS International and B&M Consultants. 2016. Review of Support from DFID's Climate High Level Investment Programme to the CRGE Facility.

Recommendation #7: Incorporate explicit exit strategies into each new project or programme in order to improve sustainability

While the value of continued support is clear, project funding is inevitably time and resource limited. This should be taken into account in future programming so that potential exit is considered from the outset of any project. The FTI process indicates that effective exit strategies may include: (1) scaling up support, (2) handing activities to local counterparts (government but also CSOs/CBOs), or (3) community/private sector/government co-funding arrangements with a gradual transition as part of these arrangements as the programme moves towards closure. This ensures that technical assistance and support does not build dependency, with particular emphasis given to the role of CSOs/CBOs and other local stakeholders in sustainability and institutionalisation of local structures.

Annexes

Annex 1. Terms of Reference

Terms of Reference_Ref.10000

Annex 2. Evaluation framework

The evaluation was guided by an **evaluation framework**, as provided in Table A1 in the next page.

This framework served as a conceptual foundation for the evaluation, describing the general approach envisioned for answering each evaluation question, the evidence that may be collected, and the expected sources of that information.

The evaluation questions were refined to enhance the utility of the evaluation as follows:

- **Main evaluation questions:** these are the key questions that capture learning from our review of the FTI portfolio and project performance.
- **Sub-evaluation questions:** supporting sub-questions that need to be answered in order to successfully answer the main evaluation questions.
- **Forward-looking questions:** these questions enable us to learn from the experiences of the CRGE Facility and FTI projects so that we can best inform future decision making.

Table A1: Evaluation framework

Main questions	Sub-questions	Forward-looking questions	Proposed indicators	Proposed data collection methods
RELEVANCE				
To what extent were the objectives and design of FTI projects aligned with national green growth and resilience priorities and concerns, including the Government of Ethiopia's ability to deliver its CRGE vision and strategy?	What role was envisioned for FTI projects in their conceptualization? What role did FTI projects actually play? Are the stated objectives of FTI projects, consistent with these priorities and concerns, clearly defined in proposal documents? How do different groups of stakeholders perceive the role of FTI projects? On which aspects is there agreement versus disagreement? Have the FTI projects' role varied by location or sector? To what extent have FTI projects incorporated and promoted gender and safeguarding issues?	How can the role of FTI projects be made more effective in the future, and what are the related options and possibilities going forward?	Clarity and consistency of objectives vis-à-vis identified needs Extent of alignment with federal and state priorities Extent of consensus among stakeholders on FTI's role Extent of ownership and leadership in development of investment plans and projects Extent of FTI's influence on donors and development partners Degree of synergy between FTI projects and other GoE or donor initiatives Extent to which a gender responsive approach was taken into consideration in the design and implementation of each FTI project	Document review of GoE strategy documents and plans Document review of CRGE programmatic plans Sector FTI project proposals or investment plans Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Interviews with non-GRCE facility sector programmes and donors Case study analysis
EFFICIENCY				
Have the FTI projects been delivered according to plan and on budget?	To what extent have planned activities been carried out?	To what extent does the M&E systems of FTI projects contribute to future learning and decision-making?	Extent to which results are monitored and reported at each level of the results chain	Sector FTI project proposals or investment plans

	What were the key cost drivers for the FTI projects? To what extent were the intended and unintended results arising from activities commensurate with the level of effort and resources expended? What were the main reasons for deviations from the time schedule and budget? Is the monitoring of FTI project activities linked to financial monitoring and how is efficiency being measured? Were any obvious instances of duplication of effort or inefficiencies observed? How was the engagement of key stakeholders planned and implemented?	To what extend does the M&E framework of FTI projects aligned with the GCF M&E framework?	Progress against log frame indicators Availability of M&E reporting Activities delivered on schedule Extent of delays Expenditure against plan Comparison of procurement and design approaches across sectors and components Stakeholder perceptions of existing cost savings and opportunities for greater efficiency Extent to which recommendations are acted on, and in a timely manner Extent that FTI arrangements permitted and facilitated effective participation and voice of different categories of stakeholders	Review of financial data, project budgets, expenditure reports Review of Performance Indicator Reference Sheets, quarterly reports, annual reports, mission reports, and project/programme closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Case study analysis
EFFECTIVENESS				
To what extent did FTI project outputs and activities achieve the intended objectives?	To what extent have the expected outcomes been achieved? Which FTI project activities were the most effective in contributing to stated objectives? What are the	How can CRGE better tailor expectations and align investments and resources to meet realistic objectives in future? Practically and operationally, how can the CRGE Facility and its executing agencies better	Alignment between achievements and theory of change Perception of how critical the contribution of FTI projects was to changes	Sector FTI project proposals or investment plans Review of Performance Indicator Reference Sheets, quarterly reports, annual reports, mission reports, and

	characteristics of these activities? Did the FTI projects designed and implemented to synergise with other policies and programmes? To what extent have FTI projects been complementary and coordinated with activities of other GoE and donor programmes? To what extent did FTI projects have an effective M&E and reporting framework including measurable indicators, systematic and regular processes for collecting data, and feedback processes to facilitate decision making and learning?	structure and coordinate data collection and measurement efforts going forward? What systems and processes will best support such efforts?	Client and beneficiary satisfaction with the results of FTI projects Degree of coordination with GoE initiatives and programmes Extent to which FTI monitoring and reporting frameworks were used	project/programme closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Case study analysis
IMPACTS				
What is the most identifiable impact of FTI projects and how are they perceived by other executing agencies and partners?	What evidence is there of outcome and impact-level results? How does that evidence differ for women/ different groups of stakeholders? To what extent did the FTI projects achieve their intended outcomes? What alternative explanations, besides theories of change,	How should CRGE define and measure results and impact of FTI projects?	Progress against performance and results framework indicators Results by population group Extent to which both men and women were able to participate in FTIs or to benefit from project outcomes Women as % of beneficiary target population Clarity, coherence and reasonableness of theory of	Document review of CRGE Programmatic Plans Sector FTI project proposals or investment plans Review of Performance Indicator Reference Sheets, quarterly reports, annual reports, mission reports, and project/programme closure reports Interviews with CRGE Facility, Federal Implementing Entities,

	could explain differences in results achieved? Have external factors, such as fiscal policies, among others, favouring or challenging execution and influencing impacts? How have different operational models influenced the achievement of objectives and results?		change hypotheses and assumptions	Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Case study analysis
SUSTAINABILITY				
To what extent have the results and impacts of FTI projects been sustained?	Are the results achieved by the end of the funding period in 2017 still evident in 2021? How did the FTI projects expect the benefits arising from the projects to be sustained, scaled-up, and /or replicated in the future? To what extent were these expectations based on well-founded assumptions, logic, and observations? Has there been broad-based stakeholder support and participation in the FTI projects?	What strategies or factors contribute to or inhibit sustainability?	Development of exit strategies and follow-on programming Follow-on funding is identified Projects not dependent on government policies that are at risk of reversal or change Extent to which stakeholders at all levels (including government, civil society, communities, academia, private sector, women, and marginalized groups) have been actively and effectively involved and supported the projects	Sector FTI project proposals or investment plans Review logic models for assumptions and elements related to sustainability Assessment of plausibility of sustainability in case studies Review of project/programme closure reports Interviews with CRGE Facility, Federal Implementing Entities, Sector CRGE Units, Regional Implementing Entities, Executing Entities (including Woreda offices and Zone Departments) Case study analysis

Annex 3. FTI projects list

A/A	Project code	Implementing entity	Executing entity	Project title	Project start date	Project end date	Region	Budget in USD
1	EFCC-1	Ministry of Environment, Forest and Climate Change	Addis Ababa City Administration Environmental Protection Authority	Mount Jemo Wechecha Ecosystem Rehabilitation Project	01/02/2015	31/07/2016	Addis Ababa	159,982
2	EFCC-2	Ministry of Environment, Forest and Climate Change	SNNPRS Natural Resource and Environmental Protection Authority (NREPA)	Natural Resources Rehabilitation and Conservation in Selected Woredas of SNNPS	01/12/2014	30/05/2016	Southern Nations, Nationalities, and Peoples' Region (SNNPR)	684,990
3	N/A	Ministry of Environment, Forest and Climate Change		Reducing Land degradation and improving livelihoods in the highlands of Amhara			Amhara	814,477
4	N/A	Ministry of Environment, Forest and Climate Change		Creating climate change resilient communities via innovative way of bamboo forest management			2 Kebeles in Benshangul Gumuz Regions	69,399
5	N/A	Ministry of Environment,		Participatory Forest Management			Awale, Adada and Belewa Kebeles	56,100

		Forest and Climate Change			
6	N/A	Ministry of Environment, Forest and Climate Change	Application of Prosopis Juliflora Cement bonded participle boards for low-cost house construction	Afar	185,200
7	N/A	Ministry of Environment, Forest and Climate Change	Improving income status of women to create carbon sinks through reducing deforestation rate	Erer and Sofi Woreda	41,541
8	N/A	Ministry of Environment, Forest and Climate Change	Enhancing highland bamboo management and processing and improving the livelihood of the community	Oromia Region	430,886
9	N/A	Ministry of Environment, Forest and Climate Change	Combating forest and land degradation induced by charcoal production and firewood collection	K/Bayah Woreda in Somali Regional State	91,269.50
10	N/A	Ministry of Environment, Forest and Climate Change	Promotion of highland bamboo plantation for ecosystem	Oromia	470,500

				restoration and livelihood improvement in the eastern escarpment of the upper rift valley areas				
11	N/A	Ministry of Environment, Forest and Climate Change		Afforestation/ reforestation in Karamara Hill – Hadawa Kebele				78,360
12	N/A	Ministry of Environment, Forest and Climate Change		Integrated Forest Development and Management Project in Selected Woredas				390,385
13	MoA-CRGE-FTPP_01	Ministry of Agriculture	Ministry of Agriculture	Piloting CRGE strategy measures through agriculture sector climate proof and low carbon agricultural investments in Ethiopia	01/04/2014	30/09/2015	22 woredas in Oromia, SNNPR, Amhara, Tigray, Gambella, Benshangul Gumuz, Harari and Dire Dawa	5,227,063
14	MoA-CRGE-FTPP_02	Ministry of Agriculture	Ministry of Agriculture	Piloting CRGE strategy measures through agriculture sector climate proof and low carbon agricultural			2 regions, Afar and Somali	857,376

				investments in Ethiopia				
15	MoA-CRGE-FTPP_03	Ministry of Agriculture	Echnoserve	Implementation of MRV, M&E system and long-term investment planning			Oromia, SNNP, Amhara, Tigray, Gambella, Banshangul Gumuz, Harari, and Dire Dawa City	539,640
16	MoA-CRGE-FTPP_04	Ministry of Agriculture	Climate Change Forum-Ethiopia (CCF-E)	Piloting Agriculture CRGE in the Rift Valley Ecosystem	01/04/2014	30/09/2016	Oromia	233,597
17	MOI-1	Ministry of Industry	Ministry of Industry	Development of Green Area for Bole Lemmi Industrial Zone in Addis Ababa City	01/04/2014	30/09/2016	Addis Ababa	507,500
18	MOI-2	Ministry of Industry	Ministry of Industry	Development of Baseline and MRV system for GHG emissions from the industry sector and implementation of pilot GHG reduction through energy efficiency	01/04/2014	30/09/2016	National	587,000
19	MOT-1	Ministry of Transport	Addis Ababa City Administration Transport Bureau	Off-street Parking as instrument to improve traffic flow and emission	01/04/2014	02/06/2015	Addis Ababa	785,000

				reduction in Addis Ababa city				
20		Ministry of Transport		Share the road – development of walking and cycling facilities for urban transportation			Addis Ababa	715,000
21	MOWIE-1	Ministry of Water, Irrigation and Electricity	Ministry of Water, Irrigation and Electricity	Strengthening the monitoring Capacity of Petroleum Downstream Operations Regulatory Directorate	01/05/2014	31/10/2016	National	635,000
22	MOWIE-2	Ministry of Water, Irrigation and Electricity	Ministry of Water, Irrigation and Electricity	Solar power for water supply and irrigation	01/05/2014	31/12/2015	42 Woredas in Oromia, Amhara, SNNPR, and Tigray	2,599,844
23	MOWIE-3	Ministry of Water, Irrigation and Electricity	Rural Electrification Fund (REF) and the four regional energy institutions	Improving the livelihoods and life styles of rural community of the emerging regional states through the dissemination of solar energy technologies	01/04/2014	30/09/2015	42 Woredas in Benshangul Gumuz, Gambella, Somali, and Afar	2,001,316
24	MOWIE-4	Ministry of Water, Irrigation and Electricity	Ministry of Water, Irrigation and Electricity	Strategic support upgrading climate and hydrological information	01/05/2014	31/12/2015	National	700,000

				systems in Ethiopia		
25	N/A	Ministry of Water, Irrigation and Electricity		Accelerating the National Biogas Programme	Benshangul Gumuz, Gambella	63,830.80
26	N/A	Ministry of Urban Development and Construction		Solid waste management	Addis Ababa, Bishoftu, Butajira, Dessie, Gambella, Harrar, Hawassa, Jijiga, and Semera	924,931.88
27	N/A	Ministry of Urban Development and Construction	Bureaus of Construction& Urban Development	Urban greenery	Adama, Assosa, Butajira, Dire Dawa, Hawassa, Shire	432,105.83

Note: FTI project data extracted primarily from the FTI Portfolio Brochure and Project MoUs.

Annex 4. Documents reviewed

Agriculture Sector CRGE Fast Track Project Proposal, addressing eight regions: Oromia, SNNP, Amhara, Tigray, Gambella, Benishangul Gumuz, Harari and Diredawa. MoA, 2014

Agriculture Sector CRGE Fast Track Project Proposal, addressing two regions: Afar and Somali regional states, MoA, 2014

Agriculture Sector CRGE Fast Track Project Proposal: Piloting Agriculture CRGE in the Rift Valley Ecosystem; Climate Change Forum-Ethiopia, 2014

Agriculture Sector CRGE Fast Track Project Proposal: Technical Assistance and Capacity building on M&E, MRV and long term Investment plan for selected Agricultural Sector CRGE Fast Track Project Woredas; Echnoserve, 2014

Alice Caravani, Sam Greene, Nella Canales Trujillo and Aklilu Amsalu. 2017. Decentralising climate finance: insights from Kenya and Ethiopia. BRACED Working Paper.

Climate Resilience Strategy: Water and Energy

CRGE Facility Consolidated Report; Reporting Period: July 2014 – March 2017; CRGE Facility, 2017

CRGE Facility. Field Visit Report on CRGE Fast Track Investments Projects in Butajira.

CRGE Fast Track Investment Projects Proposal: Off Street Parking as instrument to improve traffic flow and emission reduction, MoT, 2014

CRGE Fast Track Investment Projects Proposal: Recreational Park Development, MUDCo, 2014;

CRGE Fast Track Investment Projects Proposal: Recreational Park Development, MUDCo, 2014;

Development of Baseline and MRV system for GHG emissions from the industry sector and implementation of pilot GHG reduction through energy efficiency. Project Proposal.

Development of Baseline and MRV system for GHG emissions from the industry sector and implementation of pilot GHG reduction through energy efficiency. Procurement plan.

Development of Green Area for Bole Lemmi Industrial Zone in Addis Ababa City. Project Proposal.

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Draft National Energy Policy (March 2021)

Energy Efficiency Strategy, 2020

Energy Management Program for the Ethiopian Manufacturing Sector, 2019

Federal Democratic Republic of Ethiopia. 2011. Climate Resilient Green Economy Vision.

Federal Democratic Republic of Ethiopia. 2011. Ethiopia's Climate Resilient Green Economy: Green Economy Strategy.

Federal Democratic Republic of Ethiopia. 2015. Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC).

Federal Democratic Republic of Ethiopia. 2020. Summary of Ethiopia's Updated Nationally Determined Contribution (NDC).

Federal Democratic Republic of Ethiopia. 2016. Industry Sector MRV System: Report on International Best Practices Overview, MRV Institutional Arrangement & MRV IT Database.

Forest Sector CRGE Fast Track Project: Mount JemoWechecha Ecosystem Rehabilitation Project, MEFCC, 2015

Forest Sector CRGE Fast Track Project: Project Proposal on Natural Resource Rehabilitation and Conservation in Selected Woredas of SNNPRS, MEFCC and SNNPR State Natural Resources and Environmental Protection Authority, 2014

FTI Portfolio Brochure, 2014

Greening Manufacturing Strategy for Ethiopia, 2019

Improving the Livelihoods and Life Styles of Rural Community of the Emerging Regional States through the Dissemination of Solar Energy Technologies. Project Proposal

Improving the Livelihoods and Life Styles of Rural Community of the Emerging Regional States through the Dissemination of Solar Energy Technologies. Procurement Plan

Industry Sector CRGE Fast Track Project Proposal: Development of Green Area for Bole Lemmi Industrial Zone in Addis Ababa, MoI, 2014

Industry Sector CRGEE Fast Track Project Proposal: Development of Baseline and MRV System for GHG Emissions from the Industry Sector and Implementation of Pilot GHG Reduction through Energy Efficiency, MoI, 2014

M&E Mission Report, Ministry of Transport, Addis Ababa Road and Transport Bureau, 2015

MoT, smart parking as an instrument to improve traffic flow and emission reduction, decision note

MoWIE CRGE Action Road Map

MUDCo M&E Mission Report, 2015CRGE Facility Quarterly reports, 2016

MUDCo, M&E report, 2015

MUDCo, M&E report, 2015Review of Support from DFID's Climate High Level Investment Programme to the CRGE Facility, 2016. By LTS International Limited and B&M Consultants PLC

Natural Resource Rehabilitation and Conservation in Selected Woredas of SNNPRS. Project Proposal.

Piloting Agriculture CRGE in the Rift Valley Ecosystem. Project Proposal.

Piloting CRGE strategy measures through agriculture sector climate proof and low carbon agricultural investments in Ethiopia [8 regions]. Project Proposal

Piloting CRGE strategy measures through agriculture sector climate proof and low carbon agricultural investments in Ethiopia (2 regins). Project Proposal

Recreational Park Development for Adama City. CRGE Quarterly Reports.

Recreational Park Development for Adama City. Decision note

Retrospective Environmental and Social Safeguards Assessment of the FTI projects. MEFDCC.

Review of Support from DFID's Climate High Level Investment Programme to the CRGE Facility, 2016. By LTS International Limited and B&M Consultants PLC.

SCS Global Services. 2017. Ministry of Industry Greenhouse Gas Inventory Verification Report.

Solar power for water supply and irrigation. Project Proposal

Solid Waste Composting in Hawassa City. Decision Note

Strategic support upgrading climate and Hydrological information systems in Ethiopia for climate resilient development and adaptation to climate change. Project Proposal

Strengthening the Monitoring Capacity of Petroleum Downstream Operations. Project Proposal.

Strengthening the Monitoring Capacity of Petroleum Downstream Operations. Decision Note.

Strengthening the monitoring Capacity of Petroleum Downstream Operations Regulatory Directorate. Project Proposal

Support from DFID's Climate High Level Investment Programme to the CRGE Facility, Value for Money report, 2016. By LTS International Limited and B&M Consultants PLC

Technical Assistance and Capacity building on M&E, MRV and long-term investment plan for Agricultural Sector CRGE Fast Track Initiatives. Project Proposal

USAID. 2015. GHG Emissions Factsheet Ethiopia. Original data from World Resources Institute Climate Analysis Indicators Tool (WRI CAIT) 2.0, 2015. Emissions including Land-Use Change and Forestry.

Zewdu Eshetu, Belay Simane, Gebeyehu Tebeje, Workneh Nigatu, Aklilu Amsalu, Abeje Berhanu, Neil Bird, Bryn Welham and Nella Canales Trujillo (2014). Climate finance in Ethiopia, ODI, London and Climate Science Centre, Addis Ababa.

Annex 5. List of interviewees

Organization	Name	Position
CRGE Facility	Zerihun Getu	CRGE Facility Coordinator
	Medhin Mekonnen	Gender and Safeguards Specialist
	Adugna Nemera Gedefa	Monitoring and Evaluation Team Leader
GGGI Ethiopia Office	Militetsega H. Gebreselassie	Program Officer
	Yigremachew Seyoum Lemma	Project Management and Monitoring Consultant
United Nations Development Programme (UNDP)	Ababu Anage	National Climate Change Specialist
Ministry of Mines and Petroleum (MoMP)	Misganu Geleti	Team Leader, Petroleum Quality Testing
	Tilahun Moges	Director, Petroleum Downstream Operation Regulatory Directorate
	Biruk Tadesse	Director, Petroleum Monitoring and Controlling Directorate
	Bedru Haile	Director, Petroleum Product Supply Monitoring and Controlling Directorate
Ministry of Water, Irrigation and Electricity (MoWIE)	Semunesh Gola	Director, Hydrology and Water Quality
	Mohammed Ali	Hydrologist
	Belaynesh Birru	Director, Environment and Climate Change Directorate
	Zelalem Asfaw	Director, Women's, Children's and Youth Affairs Directorate
	Tefera Damisa	Senior Electro-Mechanical Engineer, Renewable Energy Water Supply Directorate
Ministry of Trade and Industry (MoTI)	Gebremichael Gebrekidan	Director, Industrial Environment and Climate Change
	Ismael Mohammed	CRGE Senior Expert
	Eden Seyoum	CRGE Expert
	Girma Mekonnen	CRGE Expert
Ministry of Urban Development and Construction (MoUDC)	Fikdau Sahle	Director, Urban Greenery Directorate

	Ato Birhanu	Focal Person, Solid Waste Management
Ministry of Transport (MoT)	Jobir Ayalew	Director, CRGE Directorate
Kersa Woreda Water and Energy Desk	Yonatan Tadelle	Head, Kersa Woreda Water and Energy Desk
	Tesfaye Nigusse	Environmentalist, Kersa Woreda Water and Energy Desk
Lemen Kebele Solar PV Station	Teku Tafesse	Guard, Lemen Kebele Solar PV Station
Lemen Kebele	Detcho Orsa	Water Point Controller, Lemen Kebele
	Nigussie Megersa	Chair, Abdi Boru Seedling Community
	Atsedu Tufa	Member, Abdi Boru Seedling Community
Addis Ababa Traffic Management Bureau	Berhanu	Deputy Manager
Addis Ababa Traffic Management Bureau, Parking Directorate	Ararat Geberetsadik	Director
Kolfe-Keranio Sub-city	Anteneh Getahun	Green Areas Team Leader
Woreda 03, Kolfe-Keranio Sub-city	Abebe Tefera	Watershed management Forman
Oromia Bureau of Agriculture and Natural Resources (BoANR)	Asmara Dheresa	CRGE Focal Person
Akaki Woreda Office of Agriculture	Bekele Bayisa	Soil and Water Conservation Expert
	Tesfu Lemma	NRM Process Owner
Bilbilo Kebele	Sida Degife	Site guard
Dara Woreda, Sidama	Sileshi Negash	Animal Feed Coprocessor
	Berhanu Bekele	NRM Officer
Safa Kebele, Dara Woreda, Sidama	Mekedes Tilahun	Farmer
	Hugamo Gudura	Farmer
Enebse Sar Medir, Agricultural Development Office	Tenawe Wale	Animal resources officer Kebele
	Webe Yedege	NRM Officer
	Mulualem Anteneh	Crop Protection Officer
Kebele 033, Enebse Sar Medir	Mognenet Bekele	Chairman
	Atenafe Belay	Farmer

Adama Cleaner City and Greenery Development Office	Tsehay Getahun	Team Leader, Cleaner City and Greenery Development Office
Adama Urban Greenery Development	Muluneh Dabesa	Team Leader, Urban Greenery Development
Odda Buletu SME	Hassen Husen	General Manager
Gaddise Kerroo SME	Adem Kassien	General Manager
Billtuu SME	Girma Bayessa	General Manager
	Tigist Gudisa	Financial Manager
Melda Ebba SME	Ayana Amante	Gardener
Hawassa Municipality	Ourge Alemu	CRGE Focal Person and Team Leader, Service Standard Directorate
	Teklu Dera	Urban Greenery Senior Expert
Hawassa Compost Facility	Mathios Fikru	Compost Site Manager
Hawassa Topic Greenery Association	Yonatan Gure	General Manager
Sysproen PLC	Zemenfes	General Manager
Liyu Parking Association	Zelalem	General Manager

Annex 6. Case study sampling strategy

Choosing FTI projects for case study analysis and identifying suitable regions/woredas for field visits was an important part of ensuring that the overall objectives of this evaluation are met. Our sampling process for case study selection work locations followed a pragmatic and purposive approach.

The following criteria were used to select FTI projects for case study analysis:

- **CRGE sector coverage.** The selected projects should provide coverage across all CRGE sectors.
- **Geographic representation:** The selected projects should roughly reflect the composition of Ethiopia's regions.
- **Representativeness:** The selected FTI projects should be representative of the overall FTI portfolio in terms of budget allocation.
- **Interest and learning needs of the CRGE Facility**: In making the final selection of case study projects, the evaluation team consulted the CRGE Facility to understand their learning needs and other considerations they had for the case study selection.

Additional criteria were introduced in relation to field visits.

- **Duty of Care.** An additional criterion was introduced in relation to field visits. The regions/woredas should be safe to travel and pose no risks to the evaluation team. Regions for which travel restrictions existed at the time of the evaluation were excluded, as appropriate (including Tigray, Somali, Gambella, and Dire Dawa).
- **Scale of FTI projects.** Given the concentration of resources in certain regions, the selected woredas to carry out field visits should cover some of FTI's largest projects, while balancing these against regions with smaller portfolios.