

NR-339 - Ethiopian NAMA: Creating Opportunities for Municipalities to Pro-duce and Operationalise Solid Waste Transformation (COMPOST)

Ethiopia

NAMA for Recognition

A Overview

A.1 Party

Ethiopia

A.2 Title of Mitigation Action

Ethiopian NAMA: Creating Opportunities for Municipalities to Pro-duce and Operationalise Solid Waste Transformation (COMPOST)

A.3 Description of mitigation action

The Ethiopian NAMA COMPOST project is designed to promote greater use of Integrated Solid Waste Management (ISWM) and Urban Green Infrastructure (UGI) approaches in Ethiopian cities and towns that is assisting the Government of Ethiopia in achieving the objectives of its Growth and Transformation Plan (GTP II). The project has four outcomes: i) strengthening the regulatory and legal framework and institutional coordination mechanisms to integrate ISWM and UGI within urban systems; ii) a developed market-based system with micro and small enterprises (MSEs) that are supported professionally to ensure financial sustainability of compost production and utilization; iii) implementation of a Nationally Appropriate Mitigation Action (NAMA) that transforms the capacity of integrated urban systems to generate large emission reductions; iv) operationalized urban systems that integrate ISWM and UGI, with quantified GHG emission reductions, within a NAMA framework.

At the end of its lifetime, the COMPOST project aims at delivering direct annual emission reductions from UGI initiatives and ISWM equal to approximately 306,000 and 132,321 tCO₂e, respectively. These will accrue from the annual generation of 45,489 tones of compost from 151,629 tones of household organic waste, and the reforestation of 33, 309 ha of degraded land by the end of the 5-year project lifetime. By assuming a lifetime of 20 years for compost facilities and managed landfills as well as for carbon sequestration and the generation of renewable biomass for thermal energy, the direct emission reductions generated by the project will be 8.33 MtCO₂e, giving a GEF abatement cost of 0.80 US\$/tCO₂e.

In addition to emission reduction the project has other multiple benefits. The number of direct jobs created throughout the value chain of waste management and urban greenery by the end of the 2021 will be more than 22,500 (currently achieved), of which at least 50% will be for women and youth. The project is producing co-benefits such as increased resilience of urban areas to drought and flooding hazards, protecting the environment and improved quality of life in urban areas.

The project is implemented in six cities and towns named Adama, Bahirdar, Bishoftu, Diredawa, Hawassa and Mekelle. The project is funded by Global Environmental Facility (GEF) and United Nations Developmental Program (UNDP) as well as co-finance contribution from the government of Ethiopia.

A.4 Sector

☐ Energy supply☐ Transport and its Infrastructure☐ Residential and Commercial buildings☐ Industry☐ Agriculture☒ Forestry☒ Waste management

A.5 Technology	☐ Other	
	☒ Bioenergy ☐ Energy Efficiency ☐ Hydropower ☐ Wind Energy ☐ Carbon Capture and Storage ☐ Land fill gas collection	☐ Cleaner fuels ☐ Geothermal ☐ Solar Energy ☐ Ocean Energy ☐ Low till / No till
A.6 Type of action	☒ Other	Composting organic waste
	☐ National/ Sectoral goal ☒ Strategy ☐ National/Sectoral policy or program ☐ Other	☐ Project: Investment in machinery ☐ Project: Investment in infrastructure ☐ Project : other
A.7 Greenhouse gases covered by the action	☒ CO2	☒ CH4
	☒ N2O ☐ PFCs ☐ Other	☐ HFCs ☐ SF6

B National Implementing Entity

B.1.0	Name	Ministry of Urband Development and Construction
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B.1.9	Contact Person 3	
B.1.10	Address	

B.1.11	Phone	
B.1.12	Email	
B.1.13	Comments	

[Add Additional Entity](#)

C Expected timeframe for the implementaion of the mitigation action

C.1	Number of years for completion	5
C.2	Expected start year of implementation	2017

D Currency

D.1	Used Currency	USD ▼
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Conversion to USD: 1

E Cost

E.1.1	Estimated full cost of preparation	150,000
		Conversion to USD: 150,000
E.1.2	Comments on estimated full cost of preparation	<i>This cost is incurred for project document development and validation workshops.</i>
E.2.1	Estimated full cost of implementation	7,801,323
		Conversion to USD: 7,801,323
E.2.2	Comments on estimated full cost of implementation	<i>In addition to the GEF and UNDP funding mentioned under "estimated full cost of implementation", Government of Ethiopia has contributed up to 41,000,000 in cash and in kind as co-finance for the project implementation. These include:</i> - <i>Development of infrastructure for compost production such as shed and fences</i> - <i>Allocation of commercial areas of high land value for waste treatment and working area of MSEs free of charge</i> - <i>Allocation of human resource for coordinating and managing the project</i> - <i>Allocation of vehicles for waste transportation</i> <i>Allocation of office spaces free of charge</i>
E.3.1	Estimated incremental cost of implementation	0
		Conversion to USD: 0
E.3.2	Comments on estimated incremental cost of implementation	na

F Estimated emission reductions

F.1	Amount 	8.33
F.2	Unit	MtCO2e 
F.3	Additional information (e.g. if available, information on the methodological approach followed)	At the end of its lifetime, the COMPOST project will deliver direct annual emission reductions from UGI initiatives and ISWM equal to approximately 306,000 and 132,321 tCO₂e, respectively. These will accrue from the annual generation of 45,489 tones of compost from 151,629 tones of household organic waste, and the reforestation of 33, 309 ha of degraded land by the end of the 5-year project lifetime. By assuming a lifetime of 20 years for compost facilities and managed landfills as well as for carbon sequestration and the generation of renewable biomass for thermal energy, the direct emission reductions generated by the project will be 8.33 MtCO₂e. The project has developed an MRV system that provides procedures to measure, ☐ ☐ ☐ ☐

G Other indicators

G.1 Other indicators of implementation In addition to emission reduction, the project has direct and indirect benefits for the project implementing cities. Temporary and permanent Jobs are created for more than 22,500 people so far throughout the value chain of solid waste management and urban greenery of which at least 50% is for women and youth. The project has also produced co-benefits such as increased resilience of urban areas to drought and flooding hazards, and improved quality of life in six urban areas by creating cleaner and greener environment. Towards this end rehabilitating 33,309 ha of degraded areas of which 31,000 ha is already afforested in six cities; Adama, Bahirdar, Bishoftu, Diredawa, Hawassa and Mekelle.

H Other relevant information

H.1 Other relevant information including co-benefits for local sustainable development

A study has been conducted by independent consulting firm which assessed the socio economic and environmental positive and negative impact of the project. Such impact can be intended or unintended as a result of project intervention in Integrated Solid Waste Management as well as Urban Green Infrastructure Development in the six cities. The following have been identified as positive Environmental and Socio-economic impacts in both major intervention areas.

Environmental Impact

The change seen in the six cities as a result if project intervention in waste segregation and proper disposal of waste has resulted in positive environmental impact through reducing illegal dumping of waste by households and reducing the difficulty municipalities had to separately treat the waste according to its nature. Moreover, the introduction of both composting and recycling have improved waste collection rate in the cities which has positively impacted the environment. For example PET water bottles used to be the biggest problem of the cities by blocking drainage canals and rivers causing flooding in the cities. Water pond of Adama and Lake Hawassa were full of such kind of plastics prior to project intervention. Since the start of waste recycling business however, such type of wastes are no more a problem because the MSEs and scavengers collect and sale them to earn income.

Composting and urban/peri-urban greening is contributing to GHG emission reduction and by diverting the organic fraction of waste from land fill which otherwise would emit CH₄ to pollute the air and sequestering CO₂ respectively. It also protects environmental pollution by using compost as replacement to chemical fertilizers for urban greening. The project has achieved a total of 128,089 tones of CO₂ emission reduction so far from both the greenery and composting activities.

The soil and water conservation structures built and the increase in vegetation cover as a result of area closure and tree plantation on cliffs surrounding the cities has retained the top soil from erosion that again is creating favorable condition for more vegetation to regenerate. The result is positive and considerable impact on the environment through carbon sequestration, protection of biodiversity, protecting land degradation and maintaining ecosystem services of the areas. Lake Hawassa of Hawassa city, Lake Tana of Bahir Dar, rivers such as Blue Nile and Awash to which streams from those cliffs surrounding the cities drain were being affected by siltation as a result of soil erosion and lad slides in these. The gullies and degraded areas are now rehabilitated that has reduced siltation on those water bodies caused by extreme flooding mainly during raining season. Trees planted by the community in their compounds, road sides, parks and areas surrounding the cities are contributing to prevention of extreme heat and hence enhancing urban resilience to climate change in the six cities.

The project is using different mechanisms such as creating different types of administration mechanisms like community, MSEs and organizations; securing title deed for the areas; making the local community beneficiary as well as mobilizing stakeholders to ensure the urban and peri-urban greenery areas are rehabilitated, well managed and sense of ownership is created. This has an impact on sustainable protection of the environment including the biodiversity in the six cities. Three new plant nursery sites have been established in three cities and seedling raising capacity of two nursery sites have significantly increased. Moreover, the cities have been providing seedlings to the community for free and to a recent government initiative of 10 Billion tree plantation program. It is concluded that this has increased forest coverage in the cities as well as surrounding areas that contributes to environmental protection.

Socio -economic Impact

Flooding caused by surface runoff is decreasing in the cities as a result of the water and soil conservation structures built on the cliffs surrounding the cities and the increase in vegetation resulting from areas closure and tree plantations. This is a quote from City Beautification and Greening Bureau Team Lead of Adama who said “we have never experienced heavy rain as was last summer. But there was no much flooding in the city. Prior to the start of project intervention, small rain was enough to create huge flood on roads and slum areas in our city”. This has reduced damages on city infrastructure such as roads, ditches and water lines as well as houses caused by flooding which ultimately has reduced maintenance costs of the government and negative consequences on community livelihood.

The cities are now experiencing low flooding and colder weather as compared to pre-project intervention as a result of the urban and peri-urban afforestation and trees planted on road sides, parks and individual compounds as discussed previously in this report. This is a good indicator that the project is contributing to resilience capacity of the urban community in the six cities to extreme weather condition such as flooding and high heat caused by climate change.

Following establishment of three new plant nursery sites and increase in seedling raising capacity of two nursery sites, the city administrations have been providing seedlings to the community for free. Moreover, selected model villages in the six cities have been supported to green their neighborhood and some urban greenery areas have been given to the community for administration and use. All these project efforts have contributed towards community attitudinal change and enhancing community understanding on benefits of greening the environment that has resulted in actual observable changes in these cities; green compound and surroundings.

Some of the rehabilitated areas and areas given to the MSEs for plant nursery were illegal waste dumping sites and two of them were open landfills that people used avoid passing through and living closer to these places. After rehabilitation however, these places are no more health treats rather are used by the community to conduct special occasions such as wedding and graduation ceremony and value of land and rental price of houses close to these areas has increased.

The project has introduced compost production technology from municipal solid waste and scaled it up the past four years. Through there were few people engaged in collection and sales of recyclable waste in Adama and Bishoftu, the project has expanded the activity and replicate the practices to the other four cities. Six composting sheds have been established in the six cities and all the sheds are constructed within the landfills except for Adama which is constructed at the outskirts of the city. The lands on which the sheds are constructed were not neither settled nor used by anyone prior to construction. There was no any complain formally filled during construction and operation.

Permanent and temporary job is created to 22,500 people along the value chain of both Urban Green Infrastructure Development as well Integrated Solid Waste Management. The trainings, awareness raising programs and community engagement has resulted in attitudinal change towards urban greening and waste management. The cities are becoming cleaner and greener as a result.

I Relevant National Policies strategies, plans and programmes and/or other mitigation action

I.1 Relevant
National

The project is linked with the following relevant sectoral climate and development policies, strategies and regulations:

Policies **Climate Change Resilient Urban Green Development Strategy (CCRUGDS)** developed to ensure that Ethiopian cities contribute towards national development and transformation and to capacitate cities to entertain and shoulder changes

Climate Change Resilient Green Infrastructure Strategy identifies areas that have a significant contribution to GHG emissions and which have a serious impact on climate change. It emphasizes protecting and re-developing forests

National Urban Green Infrastructure Standards (NUGIS) provides a framework for municipalities to develop effective and sustainable urban green infrastructure (UGI) for their citizens in order to protect public health and environmental quality

Urban Plan Preparation and Implementation Strategy - underlines the importance of allocating a minimum of 30% of the surface area of cities to be covered by greenery. It also focuses on including green areas and public recreation centres in land management plans

Urban Solid Waste Handling and Disposal Strategy states that solid waste that is not handled and disposed of properly will exacerbate climate change. Greenhouse gases released from landfills are noted as a major cause of global climate change

National Urban Solid Waste Management Standards (NUSWMS) creates the framework for municipalities and city administrations to provide effective, affordable and sustainable urban SWM systems in order to protect public health and environmental quality

National Solid Waste Management Proclamation, SWMP (No. 513/2007) and National Solid Waste Management Proclamation, SWMP (No. 513/2007)

I.2 Link to other NAMAs

(none)

Sustainable Housing Programme

High Integration Program of Wind Energy

Implementation of a National Forestry and Climate Change Strategy, including the development and implementation of a Platform for the Generation and Trading of Forest Carbon Credits.

J Attachments

J	Attachments	Title	Description	
		<u>ETH-RFP-2017-15-MRV-Mechanism-Final-20180530.pdf</u>	Carbon offset verification mechanism	
		<u>Final Ethiopia NAMA Project ESIA Report February 11 2021.pdf</u>		
		<u>PIMS - 5541 - CCM - Ethiopia - COMPOST - ProDoc - final - 13 July 2016 - final.pdf</u>	Project document	
		<u>UNDP Ethiopia Carbon Market - Operational Manual - Draft</u>	Carbon Offset Mechanism Operational Manual	

		<u>Title</u>	<u>Description</u>	
J.1	Attachment description	3.0 - 02.12.19.docx		
J.2	File	Choose File	No file chosen	
Upload File				