INITIATIVE FOR CLIMATE ACTION TRANSPARENCY – ICAT

Expansion of the National GHG Inventory Management System and Operationalization of NDC Tracking Framework

Project no

ICAT Initiative for Climate Action Transparency

Transport and Waste Sectors Data Inventory Templates

Deliverable E

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Abbreviations

CY	Calendar Year
EACOP	East African Crude Oil Pipeline
GHG	Greenhouse gas
ICAT	Initiative for Climate Action Transparency
IPCC	Integumental Panel on Climate Change
MEMD	Ministry of Energy and Mineral Development
MWT	Ministry of Works and Transport
NDC	Nationally Determined Contributions
SWDS	Solid Waste Disposal Sites
UNOC	Uganda National Oil Company
URA	Uganda Revenue Authority
USD	United Stares Dollars

Executive summary

The Country Work Plan of the ICAT project in Uganda focuses on sustainably enhancing the GHG emission inventory, projections and mitigation analysis modelling capability for the Transport and Waste sectors.

The Transport and Waste sectors data inventory templates were prepared to assist organisations in the collection of data for the preparation of the GHG inventory. These templates are for compiling disaggregated data encouraged in current GHG reporting requirements (e.g., Biennial Update Report).

The waste sector templates include datasheets for data entry covering the subsectors: Solid Waste Disposal Sites (SWDS), Biological Treatment (composting and Anaerobic Digestion), Incineration, Open Burning, Domestic Wastewater Treatment and Discharge, Industrial Wastewater Treatment and Discharge.

The transport sector templates have been prepared to provide separate datasheets for the different sub-sectors coving all the modes of transport. The sub-sectors included are road sector, civil aviation, marines (ship, boats, ferries) and railways. Uganda is planning to have pipeline as one of the modes for transport when the commercial oil drilling starts by the year 2025. The templates were designed with easy-to-follow primary data input.

Developing these templates is a contribution to the building of a national transparency framework that meets international standards, tailored to domestic needs. These templates will enable the achievement of consistency and accuracy of data in these sectors. The templates will be piloted to gather data and tested to ensure that they are suitable for the various data providers.

1   Introduction

The Country Work Plan of the ICAT project in Uganda focuses on sustainably enhancing the GHG emission inventory, projections and mitigation analysis modelling capability for the Transport and Waste sectors to enhance Uganda's ability to track the NDC actions in these two sectors. The ICAT Uganda project (titled: *Expansion of the National GHG Inventory Management System and Operationalization of NDC Tracking Framework*",) focusses on the Transport and Waste sectors. This project has the specific objectives to:

1)   Contribute towards ongoing efforts to build a national transparency framework that meets international standards and is tailored to domestic needs;

2)   Strengthen the national capacity to apply methodologies and tools to assess GHG and sustainable development impacts, and the effectiveness of policies, measures, actions and plans included in the NDC;

3)   Contribute towards ongoing efforts to improve the availability and quality of data required to measure GHG and sustainable development impacts;

4)   Support the formulation of NDC indicators in a manner that allow consistent monitoring and evaluation of progress; and

5)   Contribute towards ongoing efforts to develop frameworks that facilitate tracking of progress on NDC implementation and strengthen capacities to construct and apply indicators towards that end.

To implement the project, one specific area of activity is to: *Strengthen the sector working group's capacity to manage sector GHG inventories, conduct baseline and mitigation scenario projections.* To achieve this, one key activity area is to develop data collection templates to assist Uganda in improving the data collection process for Transport and Waste sectors.

1.1   Aim of this deliverable

The aim of this deliverable is to produce the data collection templates for the transport and waste sectors which include information to assist Uganda in moving towards a Tier 2 approach for these two sectors. It is planned that these templates will be piloted to gather data and test them to ensure that the templates are suitable for the various data providers. Base data collected using the templates will assist in the development of improved baseline projections and the templates can assist with the tracking of indicators for the NDC actions.

The purpose of this report is to present the data collection templates and provide information on how the templates were developed and who was consulted in the development process.

2   Background

2.1   Uganda's Transport Sector

Uganda has four modes of transport, namely road transport (which form the bulk of fuel combustion), aviation, marines (ships, boats and ferries) and railways. Diesel and petrol are largely used in the transport sector and for aviation jet kerosene is widely used along with a limited amount of aviation gasoline. However, in order to reduce the emission in the transport

sector, with effect from 1st July 2024, Uganda will also be using blended fuels in the transport sector.

There is a committee comprising of the key stakeholders such as Ministry of Energy and Mineral Development, Uganda Revenue Authority, Ministry of Works and Transport. They share the data for quality assurance. All companies which import petroleum products used supply data to Petroleum Supply Department in the Ministry of Energy and Mineral Development. The current arrangement, UNOC (Uganda National Oil Company) is a state-owned company that was established to ensure a secure and sustainable supply of petroleum products in the country. With UNOC becoming the sole importer of petroleum products into the country.

Uganda has National Transport and Logistic policy. It serves as the overall arching policy and regulatory framework for all transport and logistic infrastructure and services. The drafting will soon commence of the following policies and laws, National Railway Transport Policy and National Urban Mobility Policy.

2.1.1 Road Transport

There is ongoing rehabilitation of national road network under national infrastructure and series development. The average construction cost for upgrading roads to paved standard with bituminous surface treatment during the FY 2022/23 was UGX 3.28Bn billion per kilometre. The average cost of reconstruction/rehabilitation of the paved roads was UGX 1.96Bn billion per kilometre. The road condition of the national roads network in fair to good condition was 95.7% and 73% for paved and unpaved roads respectively, while that of the DUCAR network was at 67%. Petroleum products (which include petrol, diesel, paraffin, aviation fuel etc.) came second, with an import expenditure increasing from USD 950.8 million in the CY2020 to USD 145 1,260.1 million in the CY2021

2.1.2 Railway Subsector

Although the railway system is designed for Cargo and passengers, the bulk of the activities is based on freight. Passengers' transportation is limited with the Greater Kampala Metropolitan Area. The railway system has been undergoing rehabilitation. So far, Malaba-Mukono Railway (220.9km) has been rehabilitated. On the other hand, the Kampala-Mukono railway has been reported to at 30% of its rehabilitation progress. There is factory for manufacturing concrete sleepers for refurbishment works on Mukono-Kampala railway line (25km) was completed. About 20,000 concrete sleepers were manufactured.

The rail freight cargo slightly increased to 66.6m net tonne km in FY 2022/23 from 66.3m net tonne km in FY 2021/22. Total wagon turnaround time (Mombasa-Kampala) was 30.5 days against a target of 25 days in FY 2022/23. Freight transportation costs (per ton per km) from Mombasa, Kenya to Kampala (on Rail) (in USD): 0.09 was attained out of a target of 0.038.

2.1.3 Marine Subsector

There is a bright future for marine transportation. Construction works at Fisheries Training Institute (FTI) Entebbe to conduct maritime safety and survival training skills for all water transport users were at 68% completion compared to the target of 70%. Construction works of 2 Search and Rescue (SAR) centres at Kaazi and Kaiso landing site at Lake Victoria and Lake Albert were at an average of 20% completion. Construction works for ferry landing sites are

ongoing. During the financial year, 2 ferries were added to the network and 13 ferries were operational Uganda import costs through Dar Es Salaam port via (Mwanza) to Kampala (PortBell) on water was attained at a rate of USD: 0.0683 compared to the target of 0.048. The cost will reduce further as the freight transport increases.

2.1.4   Aviation Sub-sector

There has been an increase in in the Ugandan aviation sub-sector transport. Commercial aircraft movements increased from 25,457 commercial flights in FY 2021/22 to 29,845 commercial flights in FY 2022/23. The number of international passengers increased from 1,244,604 passengers in FY 2021/22 to 1,709,084 in FY 2022/23. However, air traffic cargo (Imports & Exports) reduced from 63,756 tonnes in 2021/22 to 55,601 tonnes in FY2022/23

Rehabilitation and expansion of Entebbe International Airport

The New Passenger Terminal Building construction is ongoing in Entebbe International Airport. There is a new airport under construction, the Kabalega International Airport is 94% completed. The Regional Aerodromes at Arua, Gulu, Pakuba, Lira, Moroto, Kidepo, Soroti, Tororo, Jinja, Kasese, Mbarara and Kisoro buildings, grounds namely runways, taxiways and aprons were well-maintained. This will boost the domestic aviation sector.

2.1.5   Pipeline Subsector

 Oil produced in Uganda's Lake Albert region will transit Tanzania through the East African Crude Oil Pipeline (EACOP) arriving at the coastal port of Tanga where it will then be sold into world markets. Oil production is expected to start in 2025. The Petroleum Authority of Uganda (PAU) will be monitoring and regulating petroleum exploration, production, refining, transportation and storage.

The Uganda National Oil Company (UNOC) is responsible for the state's commercial interests in the sector, including ownership of its shares in a planned oil refinery, crude oil export pipeline and upstream projects. Two oil development projects are being pursued by a consortium of TotalEnergies and China National Oil Corporation, along with the Uganda National Oil Company. Commercial production is scheduled to begin in 2025, and peak production from existing projects is expected to reach about 200 thousand barrels per day (kb/d) by 2028.

Uganda is still at construction phases for the EACOP and the upstream feeder pipelines, all of which will transport crude. The government of Uganda is planning to build a refinery. Uganda is negotiating with Alpha MBM based in UAE is to provide primary source of investment capital in the refinery construction. Alpha MBM is in consortium for the refinery project with two companies with extensive oil and gas experience. The refined petroleum will be transported by pipeline to load center in Central Uganda[1].

Tanzania and Uganda signed a bilateral agreement to construct a natural gas pipeline that will boost energy security and economic growth in both countries. The pipeline will transport natural gas from Tanzania's southern regions to Uganda, where it will be used to power

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[1]

https://observer.ug/index.php/news/headlines/80492-uganda-moves-a-step-closer-to-a-domestic-oil-refinery accessed on 08-02-2024

factories and generate electricity[2].

The upstream and midstream oil and gas operations of Uganda have not yet commenced pipeline transportation of petroleum resources.

2.2 Uganda's Waste Sector

The purpose the waste sector template is to help inventory compilers document and report datasets (e.g., activity data and emission factors), used to estimate GHG emissions from the waste sector in accordance with the 2006 IPCC Guidelines and good practice. This template facilitates compiling disaggregated data encouraged in current reporting requirements (e.g., Biennial Update Report). The waste sector templates include sheets for dater entry for the subsectors: Solid Waste Disposal Sites (SWDS), Biological Treatment (composting and Anaerobic Digestion), Incineration, Open Burning, Domestic Wastewater Treatment and Discharge, Industrial Wastewater Treatment and Discharge.

The sectors templates will contribute to the building of a national transparency framework that meets international standards and is tailored to domestic needs. These templates will enable the achievement of consistency and accuracy of data in the sector to assist NDC monitoring. The templates are intended to be used by the various data providers in these sectors.

Uganda has an established legal framework for waste management. The National Environment (Waste Management) Regulations, 2020 (S.1.No. 49 of 2020) classifies wastes under specific schedules of the Regulations and provides for the management of wastes at its generation, collection, transportation, storage, treatment and disposal

3 Methodology

The templates for transport sector include the four-transport modes and pipeline which will be operational in the near future. There are provisions for assumption made by compliers. In cases where different units are used a conversion table is provided, which can be used by the compiler to convert the units to the required templates before incorporating the data. The main activity data in the transport sector is aggregated, as presented in national energy balance. Since there is no compressive study of the vehicle fleet in Uganda, the fuel consumption per category is based estimate from other studies

The waste sector templates were designed based on the 2006 IPCC Guidelines methodology and data entry requirement for Greenhouse Gas (GHG). The greenhouse gases are gases in the atmosphere such as water vapour, carbon dioxide, methane and nitrous oxide that can absorb infrared radiation, trapping heat in the atmosphere. This greenhouse effect means that emissions of greenhouse gases due to human activity cause global warming. Tables are provided for greenhouse gas emission estimation.

The waste sector working Group was consulted throughout this process to comment on data availability as regards the transition from Tier 1 to Tier2. Key stakeholders in both the transport and waste sectors were consulted (see Annex) during the development of the templates. The

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[2]   https://www.theeastafrican.co.ke/tea/business/tanzania-uganda-sign-gas-pipeline-deal-4429132 accessed on 08/02/2024

draft templates for waste and transport sectors were submitted to GHGMI for initial comments and later presented to CCD for feedback in a virtual meeting on the 15th December 2023.

The Waste Data Collection Template was designed to include data entry sheets that provide for data entry for waste generation data, waste characteristics, waste disposal and treatment methods. Provisions are made for making notes on methodology, assumptions, references, data compilers.

4   The Waste and Transport Sector Inventory Data Collection Templates

4.1   Waste Sector

The data collection template has been prepared to provide separate datasheets for the different waste subsectors, solid wastes and wastewater and the available disposal and treatment methods. This was done to ensure clarity, consistency, and a logical understanding of the waste sector, the disposal methods and treatment methods that are associated with GHG emission. The data entry sheets are tailored to fit the specific needs of the various data entry organizations such as NEMA, KCCA and CCD requirements for reporting. The waste sector data collection template is attached to this report.

The data templates are for Tier 1 and Tier 2 separately. Before data entry the templates have a preliminary section consisting of a General Introduction of the objectives of the templates and Instructions on how to use of the templates. Data requirements for Tier 1 and Tier 2 is shown in sheet 1. Sheet 2 is for general information on the data compilers. After the preliminary sheets, data sheets for the waste subsectors provided. The data sheets are in the following order; Solid waste disposal sites (SWDS), Biological Treatment (composting and anaerobic digestion), Incineration, Open Burning, Domestic Wastewater, and Industrial Wastewater. Details methodology on data collection and treatment are found in the Greenhouse Gas Inventory Manual for Uganda Version 1, 2015 (Ministry of Water and Environment). Additional guidelines for GHG inventories are found in UNFCCC Resource Guide[3] and IPCC Guidelines[4]

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[3] UNFCCC. Resource Guide for Preparing the National Communications of Non-Annex 1 Parties. Module 3. National Greenhouse Gas Inventories

[4] 2006 IPCC Guidelines. IPCC Vol. 5 Waste. Waste: https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html

[5] UNFCCC. Resource Guide for Preparing the National Communications of Non-Annex 1 Parties. Module 3. National Greenhouse Gas Inventories

[6] 2006 IPCC Guidelines. IPCC Vol. 5 Waste. Waste: https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol5.html

4.2   Transport sector

The procedure for data documentation were presented in all modes of transports in the templates. The template has been prepared to provide separate datasheets for the different subsectors coving all the modes of transport. However, there is limited information about the pipeline transport. It is envisaged that more information will become available as the data collection process proceeds. The subsectors considered are road sector, civil aviation, marines (ship, boats, ferries) and railways.

Among the aims of the data collection templates are to support future inventory compilers in their compilation effort as they will be able to better understand previously collected data. This is important for institutional memory. The data template will facilitate transparency, accuracy, consistency and accountability. The details were well elaborated in the procedure for data documentation in all sectors of transport

 The template has four main sections, namely introduction, details of data collector, data template for Tier and data template for you for Tier 2. The templates were designed with easy-to-follow primary data input.

 Introduction section explains the purpose and step by step how to fill the data sheet. Colour coding was used to enhance data visualisation. It also helps to distinguish between categories, when entering data. If an estimate is made, it should be stated under the "Comments" section. The uncertainty data if available or not it should be documented in appropriate columns. If an estimate based on expert opinion, then the complier should include this estimate and provide the expert's name and contact details in the "Uncertainty source" column.   All data collected should be referenced with contact details.

5   Conclusions and way forward

The next step will be pre testing on the template to key statehooders and modify where it is necessary and populating the template. The waste and transport sector's data collection templates will:

- help current inventory compilers in drafting a National Inventory Report;

- support future inventory compilers in their compilation effort as they will be able to better understand previously collected data,

- improve data collection approaches and methodologies for improved compilation efficiency and consistency; and

 allow users to reproduce past estimates, increasing the transparency of reporting, which can be particularly valuable for peer review processes.

References

The Republic of Uganda, Ministry of Works and Transport, Integrated Transport Infrastructure and Services Programme, The 3rd Annual Programme Review Workshop, Programme Performance Report for FY 2022/23.

The Republic of Uganda, Ministry of Works and Transport, The National Trasport and Logistic Policy 2021.