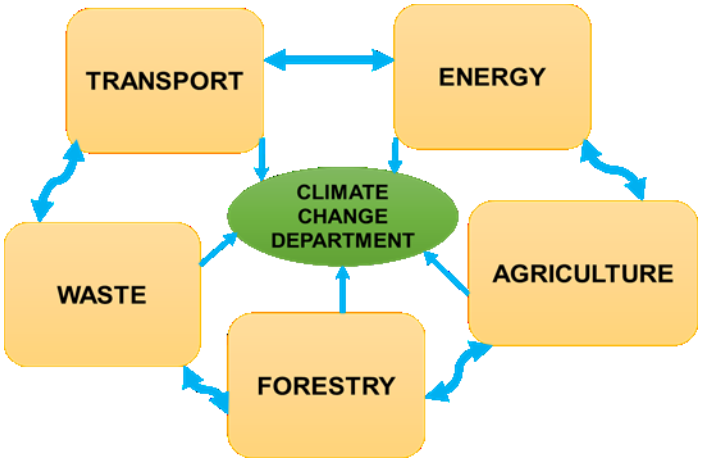
MINISTRY OF WATER AND ENVIRONMENT

Climate Change Department

TECHNICAL GUIDE FOR GREENHOUSE GAS DATA SHARING BETWEEN THE MINISTRY OF WATER AND ENVIRONMENT AND SELECTED KEY EMITTING SECTORS IN UGANDA



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Foreword

Uganda ratified the 2015 Paris Agreement of the UNFCCC in 2016 to join the global efforts to track, compare and understand its national commitments to fight climate change in the global context. Enabling reforms and developments have since been registered, to support national emissions data management. These include: the Climate Change Policy 2015, the Green Growth Development Strategy (2017/18 – 2030/31), the Climate Change Bill draft (2017), and a National Inventory for Greenhouse gases.

We are delighted to unveil the Ministry of Water and Environment Technical Guide for GHG data sharing between the MWE and the selected key emitting sectors in Uganda, including Agriculture, Energy, Forestry, Transport and Waste. The preparation of the GHG technical guide is in line with the MWE reforms and efforts to construct a robust GHG Inventory and MRV system for Uganda. The guide particularly fulfils the aspirations for improved transparency reporting, being addressed through implementation of the Uganda Capacity-building Initiative for Transparency (CBIT) Project funded by the Global Environment Facility.

The guide serves both as reference material, and provides assurance that the sectors shall endeavor to adhere to the main principles of the guide, by adopting and using standardized approaches and formats, and timely transmission of the data and information required by MWE for reporting to the UNFCCC.

Finally, we encourage our partners to make the best use of the Technical Guide for GHG data sharing as we strive to comply with the national reporting and the international transparency requirements of the Paris Agreement.
For God and my country

Mr. Alfred Okot-Okidi
Permanent Secretary
Ministry of Water and Environment

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Acronyms

AFOLU	Agriculture, Forestry, and other Land Uses
BURs	Biennial Update Reports
CBIT	Capacity Building Initiative for Transparency
CCD	Climate Change Department
EITI	Extractive Industries Transparency Initiative
ETF	Enhanced Transparency Framework
GHG	Greenhouse Gas
GHGI	Greenhouse Gas Inventory
IPCC	Inter-governmental Panel on Climate Change
KCCA	Kampala City Council Authority
LG	Local Government
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MOU	Memorandum of Understanding
MoWT	Ministry of Works and Transport
MRV	Monitoring, Reporting and Verification
MWE	Ministry of Water and Environment
NARO	National Agriculture Research Organization
NCs	National Communications
NDCs	Nationally Determined Contributions
NEMA	National Environment Management Authority
NFA	National Forestry Authority
QA	Quality Assurance
QC	Quality Control
UBOS	Uganda Bureau of Statistics
UNFCCC	United Nations Framework Convention on Climate Change

Acknowledgment

The Ministry of Water and Environment (MWE) extends special appreciation to the Global Environment Facility (GEF) for their generous funding of the CBIT Uganda Project through Conservation International (CI) and the Africa Innovation Institute (AfrII). We have benefited from the overall guidance and support of the partners that has enabled the successful development of the Technical Guide for GHG data sharing between the Ministry of Water and Environment and selected key emitting sectors in Uganda. We wish to thank the MWE Climate Change Department team, the sector teams from agriculture, energy, forestry, transport, waste, and Industrial Processes and Product Use for their dedicated participation and valuable inputs that informed the technical guide. We thank teams from CI and AfrII for insights and reviews during compilation of this report. Specifically we wish to thank the CBIT-Project Management team from AfrII; Dr. Felly M. Tusiime, Dr. Benard Fungo, Ms Elizabeth Ahumuza, and Prof. G. W. Otim-Nape for their technical support, coordination and reviews of this report. We recognize the support from Mr. Victor Esendi and Dr. Peter Alele from CI for their technical and administrative guidance throughout the assignment. Without all your valuable contributions, we would not have had a document so responsive to the local context and fit to purpose to facilitate the transmission of emissions data from the lead emitting sector institutions to MWE. Finally, we acknowledge the tireless efforts by the consultancy team; Ms. Susan Bingi, Ms Olive Zaale Otete and Dr. Geofrey Gabiri for the research and compilation of this report.

Glossary

Activity data: data on the magnitude of human activity resulting in emissions or removals taking place during a specific time period, according to Revised 1996 IPCC guidelines for National Greenhouse Inventories.

Data: In this context, data is information that has been translated into a form that is efficient for sharing and processing.

Data sharing: Refers to the disclosure of data from one or more organizations to a third party organization (s), or the sharing of data between different parts of an organization.

Greenhouse Gas (GHG): Any gas that absorbs infrared radiation in the atmosphere; Greenhouse gases include, carbon dioxide, methane, nitrous oxide, ozone, chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride[1].

Greenhouse gas Inventory: An estimate of all emissions and removals of greenhouse gases (GHG) from given sources or sinks from a defined region in a specific period of time.

Information/processed data: IsGHG data that has been processed in such a way as to be meaningful to the person who receives it.

[1]Thelma Krug. 2015. GHG Inventories: Their Importance to Monitor Progress in Climate Change Mitigation. IPCC Open Symposium.

1.0Things to know about the guide

1.1 Introduction

The concept of data sharing refers to the ability to share the data between institutions. Data can be freely shared as open data or with conditions or under license/contract. Data sharing may take the following forms: Reciprocal exchange of data; one or more organizations providing data to a third party or parties; several organizations pooling information and making it available to each other or to a third party or parties; exceptional, one-off disclosures of data in unexpected or emergency situations; or different parts of the same organizations making data available to each other[2].The benefits of data sharing are multifold; strengthens cross sectoral cooperation towards accomplishment of common objectives, and more interaction results into new innovations in data processing and management methodologies. Data sharing process also allows the exchange of resources through training and harmonized data formats and transmission modes[3].

Data sharing involves some core elements regardless of data type and provenance. It is the context in which data sharing takes place that will have the most impact on how that sharing process is conducted, and how it will dictate the particular nature of the barriers that present themselves to the development of data sharing norms within the sectors. Effective data sharing involves a data source, recipient and a sharing mechanism. Motivation to share data by the institutions involved is driven by among others, the individual interests in the data available among the participating sectors or institutions. The ability however, to process and prepare data suitable for sharing remains a technical challenge to data suppliers. Adherence to standard data formats and management plans could however mitigate these. Other key considerations include a clear definition of roles and responsibilities for data sharing, and preparation of a work schedule that elaborates the timing and deliverables expected from all the parties involved in the data sharing process.

1.2 Objectives of the guide

The aim of this guide is to:

I. Provide a framework for the establishment of working practices between CCDMWE and the selected key emitting sectors (Waste, Energy, Transport, Forestry and Agriculture) for the sharing of emission data.

[2]Wallis*et al*,2013. If We Share Data, Will Anyone Use Them? Data Sharing and Reuse in the Long Tail of Science and Technology

[3] Matthew Brack and Tito Castillo.2015. Data Sharing for Public Health Key Lessons from Other Sectors. Centre on Global Health Security

II. Facilitate the sharing of emissions data among the selected key emission sectors and with CCD-MWE.

III. Improve the transparency and accountability for stakeholders involved in the GHG data collection, processing, transmission and reporting.

1.3 Importance of the Guide

- The guide encourages more connection and collaboration between the selected key emitting sectors with CCD-MWE to effectively share emissions data and information to improve policy decisions on climate change mitigation and adaptation.
- The guide shall support the continuous monitoring and review of all information flows, and methodologies being used by the selected sectors to collect and process GHG data.
- The guide will also enhance the quality of the data collected and transmitted, and timeliness of GHG reporting and transparency to the UNFCCC by CCD-MWE.

1.4 How to use the guide

The guide is only a reference guide for data sharing among the sector institutions and with CCD MWE and is included as an addendum to the sectoral Memorandum of Understanding (MoU) between the sectors and CCD-MWE. The guide is by no means intended to replace the IPCC guidance and guidelines for GHG data sharing. Changes in data management methodologies among the participating sectors may also call for an update of the technical guide to ensure that a standardized approach to data management is maintained.

1.5 Users of the guide

The guide is intended for use by selected key emitting sector institutions in Uganda, particularly, for use by the GHG data processors/generators, quality controllers and data archivers /compilers in the participating sectors. The guide is also intended for use by the GHG Inventory Team at CCD-MWE as the central agency that compiles and processes GHG data for purposes of preparing the various UNFCCC reports for example the Biennial Update Reports and National Communications.

1.6 Scope of the guide

The technical guide is developed to facilitate GHG data and information sharing between selected key emission sectors (Agriculture, Energy, Forestry, Transport and Waste) and with CCD MWE of Uganda.

1.7 Methodology used to prepare the guide

The preparation of this guide was informed by two primary approaches; a review of international best practices for GHG data sharing contextualized to the Uganda scenario, and the proactive consultations and engagement with the target sectoral institutions through workshops and meetings. The guide is informed by the IPCC 2006 Guidelines and CBIT project assessments and stakeholder consultative processes such as the GHG data needs and training assessment, and the preparation of the sectoral MoUs by MWE.

The technical guide may be updated periodically to respond to the changes in UNFCCC reporting requirements. All updates and changes to the guide shall be initiated and facilitated in cooperation with CCD MWE.

2.0 Context

2.1 Introduction

The United Nations Framework Convention on Climate Change (UNFCCC) requires all Parties to periodically develop and submit national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol[4]. An exception is however made for the non-Annex I (NAI) Parties, which are mostly developing countries, with the periodicity of inventory reporting being dependent on the requirements for submission of National Communications (NCs) and Biennial Update Reports (BURs). The UNFCCC requirements for reporting by NAI Parties have evolved, with reporting provisions further enhanced from 2010 onwards. The frequency of the submission of NCs from NAI Parties was set to every four years, with an additional requirement to also provide BURs every two years, including updated GHG inventories as well. Currently, developing countries should generate a GHG inventory every two years to comply with the requirements under UNFCCC decision 1/CP.16. (GIZ, 2017). A summary presentation of the main reporting requirements and their frequency is included as Annex 1.

One of the mandates for the IPCC framework is to foster data sharing and collaboration among the selected key emitting sectors and other organizations, across multiple levels of public, private and non-profit entities. Successful inter-sectoral data sharing and collaboration is based on adopting guiding principles, identifying best practices as well as recognizing the challenges. It is worth noting that data collected for sharing within and

[4] IPCC 2010, Use of Models and Facility-Level Data in Greenhouse Gas Inventories (IPCC Expert Meeting Report).

across institutions should be accompanied by well-defined and responsible data protection practices that are understood by users and management teams.

The purpose of this technical guide is to enhance institutional arrangements in data collection and processing on emissions, data sharing and coordination of mitigation actions and support among the selected 5 key sectors of Agriculture, Forestry, Energy, transport and Waste with CCD MWE. Data and information sharing between the hubs and the center (CCD-MWE) strengthens the institutions at national level to meet Article 13 of IPCC to efficiently compile data and information in reports and inventories for international review.

2.2Policy Context

In the early 1990s, almost all countries agreed to address climate change and its impacts. The UNFCCC was established and continues to be the foundation of the international climate regime. The Kyoto Protocol and Paris Agreement are international treaties and build on the UNFCCC convention. The convention is based on and advocates for a transparency system for climate change, through regular reporting and a review process, and holding countries accountable for their actions and obligations[5].

Under the Paris Agreement, each country is expected to report its own contributions to the global effect on climate change, thus, strengthening the global response to climate change threats, demonstrate good practices, achieve nationally determined contributions (s) and reduce GHG emissions, included as; Article 13 that establishes the Enhanced Transparency Framework (ETF). To achieve enhanced transparency, monitoring climate change at national level from the different sectors as well as sharing data, reporting on those actions to the international community and verifying, assessing and reviewing the reported information at the international level are considered best practices in the global efforts to reduce climate change impacts.

Uganda is a signatory to the UNFCCC Paris Agreement, and has started ensuring transparency and reporting of the GHG data and information through the MWE Climate Change Department (CCD). The National Strategy and Action Plan (2013) places emphasis on strengthening human resources and skills to advance green low emission and climate

[5]Daniel Bodansky. 2016. The Paris Climate Change Agreement: A New Hope? The American Journal of International Law. Vol. 110, No. 2, pp. 288-319

resilient development through improving institutional arrangements, capacity and coordination in monitoring, reporting and data sharing to achieve the enhanced transparency requirements[6]. Uganda has also enacted and assented to transparency related global initiatives such as the Extractive Industries Transparency Initiative (EITI), a global standard to promote the open and accountable management of oil, gas and mineral resources, henceforth, enhancing accountability and Transparency[7].The National Climate Change Policy encourages 'integration of climate change issues' into planning, decision making and investments in all sectors and trans-sectoral themes through appropriate institution arrangements and legal framework'[8]. Establishing a framework for data sharing is in line with the policy expectations, and the policy also compels stakeholders to submit GHG data to the central repository at MWE regularly. The technical guide for data sharing coupled with sectoral MoUs with CCD MWE are considered tools to enhance and strengthen institutional arrangements and support implementation of the policies intended to steer Uganda towards a low-carbon development path, and sustained reporting to the UNFCCC.

The Data Protection and Privacy Act 2019 is envisaged ''to protect the privacy of the institutional and personal data, regulate the collection and processing of personal data and information, provides the rights of persons/institutions whose data is collected and the obligations of data collectors, data processors and data controllers and regulate the use or disclosure of data and information''[9]. This Act guides on the privacy and confidentiality of the GHG data shared among the selected sectors and with CCD-MWE. Other related instruments in the pipeline include; Open Data Policy (draft) being prepared by the Ministry of Information and Communications Technology and National Guidance encourages open access to government data to the public, and available in reusable formats, and a with few restrictions[10]. The policy is intended to improve the transparency and accountability of government information and services through a shared platform.

All these legal policy frameworks and initiatives can support, improve and strengthen GHG data and information sharing among the selected sectors and with CCD MWE for improved and timely reporting to the UNFCCC.

[6]MWE (2014), Uganda Second National Communication to the United Nations Framework Convention on Climate Change
[7] NRGI (2015). The Extractive Industries Transparency Initiative (EITI) Using EITI to Promote Policy Reform
[8]MWE (2015), Uganda National Climate Change Policy.
[9] Republic of Uganda. 2019. The data protection and Privacy Act
[10] Ministry of Information, Communications Technology and National guidance. 2017. Open data policy. First draft. http://www.ict.go.ug/wp-content/uploads/2018/06/Open-Data-Policy-First-Draft-vX.pdf

2.2 Current state of GHG data sharing mechanisms

GHG data and information sharing is evidenced with the actual transmission of data and information from the selected emission sectors to CCD MWE by consultants engaged by MWE to inform preparation of UNFCCC reports (BURs, NCs). CCD MWE has in place a GHG data web portal and database developed to facilitate GHG data depository by the sector institutions, and also enhance transparency on data processed and transmitted by CCD-MWE. Consultations with the sectors revealed that not much was registered in form of access and use of the CCD MWE web portal and database by the sector institutions, in spite of the training and issuance of passwords to the institutions involved to access the portal. Reasons cited include staff changes in the sector institutions, with the staff trained no longer available, not sufficient clarity of the GHG inventory and the transmission requirements, and the continued use of the consultants and workshops to interface with the sectors and collect the data required by MWE. It is also important to note that the absence of a definite legal instrument (MoUs or data sharing agreements) between the selected sectors and CCD MWE is also mentioned as a contributing factor to the inert attitude demonstrated by some of the emission sector institutions.

Inter-sectoral data sharing refers to data sharing within the participating sectors. For example, the data sharing arrangement between National Agricultural Research Organization (NARO) centre/Kawanda, and National Forestry Authority (NFA) to share data and information from the national soil database that is held in custody by NARO/Kawanda. NFA is a key agency for compilation of data on land-based emissions, and this data is ultimately shared with CCD-MWE.MAAIF has used data requisition letters to obtain data on fertilizer imports from Uganda Revenue Authority, and also established a long term arrangement with UBOS to jointly generate national livestock data to compute livestock emissions.

2.3 How does the GHG Technical Guide tie into the on-going reforms

The preparation of the GHG technical guide is in line with the reforms and developments at MWE aimed at building a National GHG Inventory. The technical guide is envisaged to contribute to the past projects results such as the national framework for the MRV system supported under the Low Emissions Capacity Building Project, and the studies conducted by the Global Green Growth Institute (GGGI) intended to inform a national MRV. The guide particularly fulfils the aspirations for improved transparency reporting through the implementation of the Uganda CBIT project. Capacity building is a key element of the

project, and the guide will serve both as reference material, and provide assurance that the sectors shall endeavor to adhere to the main principles of the guide, by adopting and using standardized approaches and formats, and timely transmission of the data and information required by CCD MWE for reporting to the UNFCCC. The guide will be beneficial as an addendum to the sectoral MoUs that have been developed to facilitate data sharing among the sectors and with CCD MWE.

In addition, the guide will be a useful tool in the establishment and strengthening of institutional arrangements for the development of a robust GHG emission inventory and MRV system, based on data supplied by the participating institutions. The guide builds on CCD MWE developments such as plans to collaborate with KCCA and UBOS to develop data sharing protocols. The guide is a first step to documentation and enhancing visibility for sectors on sources of information (data providers), the data available across the institutions, the data needed/gaps, the format and data quality requirements, and the submission schedules to the central repository at CCD MWE.

3.0 Review of the National GHG system for GHG Inventory

3.1. Introduction

A national greenhouse gas (GHG) inventory is an estimate of the total quantity of GHGs emitted and removed because of human activities each year (IPCC, 2006). The inventory provides critical information for the country's emission profiles, which can be used as a tool for assessing the progress toward meeting national emissions reduction goals and for prioritizing policies and actions.MWE with support from the Global Green Growth Institute developed a draft national MRV and GHGI systems framework that details the institutional arrangement and capabilities for GHG data collection and processing in Uganda[11]. The framework is envisaged to guide partners on the investment planning in the selected sectors. Uganda launched a National GHG inventory system in 2016, with CCD MWE as the lead and coordinating agency. Establishing a national GHG inventory offers the country the opportunity to benchmark and adapt to international best practices in reporting GHG emissions to the UNFCCC. It also opens up access to available GHG data across the selected sectors in the country, promotes peer learning and exchange, opens up opportunities for effective data management, harmonization of the methodologies and tools, and data quality enhancement among the contributing key emission sectors. As a result, promoting improved data management, and transparency reporting.

[11]MWE 2015, Green House Gas Inventory Manual for Uganda Version 1.

3.2. Existing GHG data sharing arrangements

For a functional GHG Inventory and MRV system, all the key emission sectors are expected to share Activity and Processed data with the lead agency (CCD-MWE)for the production of the required UNFCCC reports. This however is not being done in a structured manner, and the sectors continue to share emission data based on requests from MWE and other interested sectors. There is however an urgent need to understand the emissions data available, who the data owners are, the movements, and if the data availed is fulfilling the objects set for the establishment of the national GHG Inventory. Following a participatory process with the sectors, the following data flow illustration has been developed, and this is preceded with a matrix of the data being shared within and between sectors.

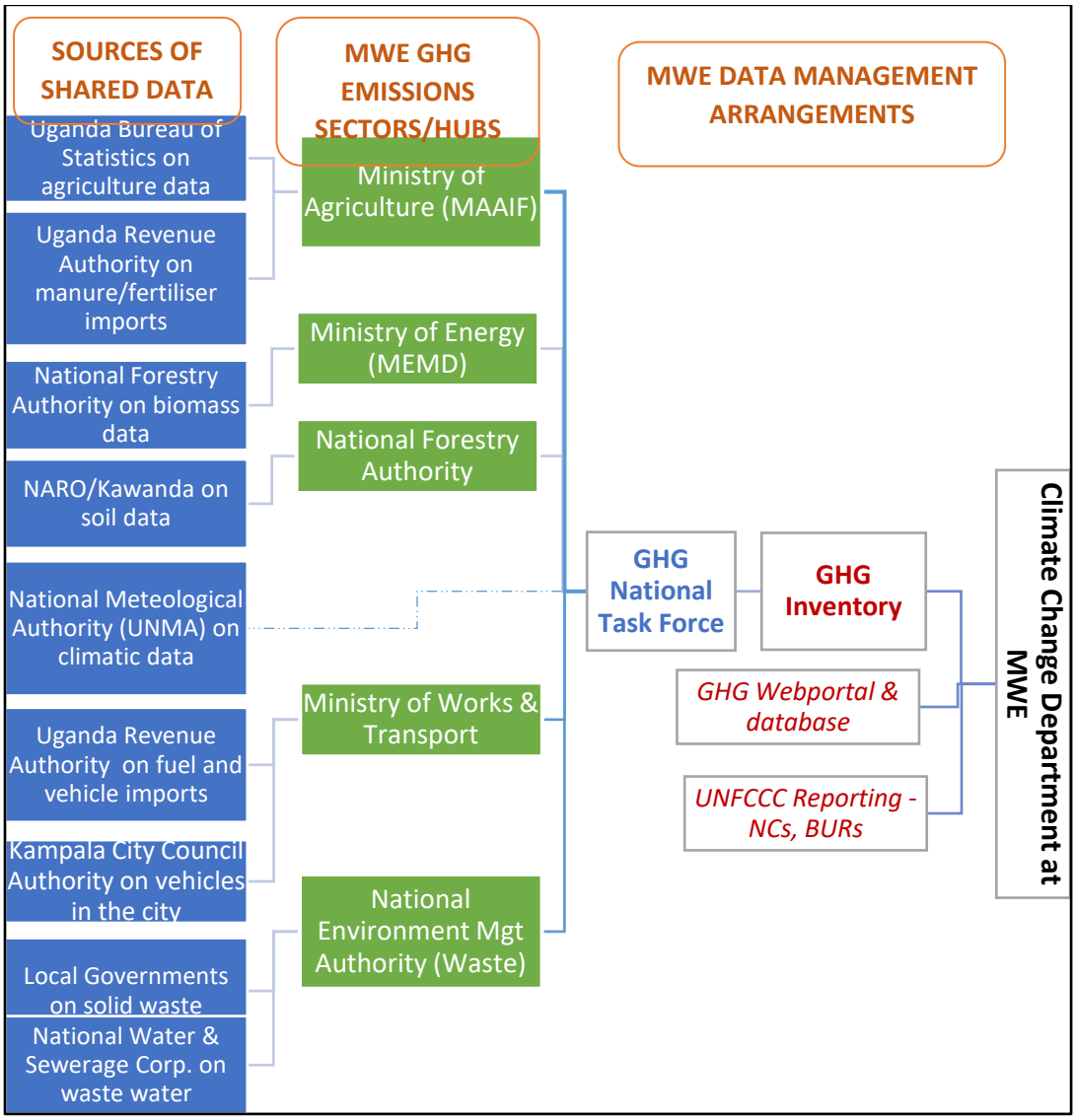


Figure 1: GHG data transmission and sharing arrangements *(informed by sector consultations)*

Table 1: GHG data being shared within sectors *(Intra)* and across sectors *(Inter)*

Sector	Data type	Intra sharing	Inter-sharing
ENERGY – Activity data	Aggregated fuel consumption	Petroleum agencies, Fuels Efficiency project	MWE-CCD, MoWT and URA
	Biomass (Charcoal, biogas, briquettes)	Private sector	MWE-CCD and Ministry of Local Government (MoLG)
	Electricity generation	Rural Electrification Agency (REA), UMEME (power distribution company), Uganda Transmission Company (UTCL)	Only with MWE-CCD
	Manufacturing industries and construction		Ministry of Trade Industry and Cooperatives (MTIC)
Energy – Processed data	Energy Balance Reports	Shared with all	Shared with all
	Annual Energy Report		
AGRICULTURE – Activity data	Livestock numbers, breeds, feeds and management systems	Shared with all	Shared with all
	Acreage under paddy rice		
	Fertilizer use		
	Water management in rice		
	Area under managed soils		
	Soil types		
	Soil amendments (organic and Inorganic)		
	Agricultural Lime		
FORESTRY – Activity data	Area of degraded and restored forest	Shared with all	Shared with all
	Volume of illegal impounded timber		
	Volume of illegal impounded charcoal		
Forestry – Processed data	Biomass data	Shared with all	Shared with CCD and the environment sub-sector institutions such as Uganda Wildlife Authority and NEMA
	Land cover/land use maps		
	Biomass reports		

Sector	Data type	Intra sharing	Inter-sharing
TRANSPORT – Activity and processed data	Air transport data	Civil Aviation Authority	MEMD, UBOS, URA
	Road transport data	Uganda National Roads Authority	MEMD, URA
	Rail transport data	Uganda Railways Corporation	None
	Water transport data – plans to collect in detail	None	None
WASTE – Activity data	Volume of Municipal solid waste (MSW) collected		
	Weight of MSW collected		
	Weight of MSW generated	Shared with all	Shared with all including CCD and the general public
	Density of MSW collected	Shared with all	
	Composition by fraction of MSW		Shared with all including CCD and academia/research
	Volume of Waste Water (W.W) generated		
	Volume of W.W collected		
	Quality of W.W received		
	Volume of W.W sludge generated	Shared with all	Shared with all except for CCD
	Quality of the effluent		
	Volume of effluent discharged		
	Number of vehicles transporting MSW	Shared with all	Shared with all and CCD
	Number of vehicles transporting MSW (transporters and operators)		
	Number of waster handlers licensed		Shared with all except for CCD
	Number of cell pool operators licensed	Shared with all	
Waste – processed data	Weight of MSW collected		
	Weight of MSW generated		
	Collection rates of MSW	Shared with all	Shared with all and CCD
	Generation rates of MSW		
	Coverage of W.W services		
	Peak volume of W.W generation		
	Off peak volume of W.W generation		
	Peak weight of MSW generated	Shared with all	Shared with all and the general public, excluding CCD
	Peak weight of MSW collected		
	Off peak weight of MSW collected		
	Off peak weight of MSW generated		
	Weight of eco from MSW emission reduction	Shared with all	Shared with CCD, all sectors and the general public

Source: CBIT Project Data Sharing workshop held on 14th March 2019 at Hotel Africana, Kampala *(participant generated)*

3.1.1 Institutional arrangements for the GHG Inventory

The UNFCCC two-year cycle for GHG inventory preparation and reporting places increased demand on developing countries to comply with the reporting demands. The inventory processes are diverse and largely technical in nature, including information (activity data) gathering from source points (e.g. ministries, national statistics office, the private sector, academia, etc.), data refining, methodological issues (e.g. choice of emission factors, calculation of emissions), and quality assurance and reporting.

CCD MWE has responded to the UNFCCC reporting demands by creating a system to facilitate timely collection and transmission of GHG data to the central repository to inform national reporting. A Hub system was developed based on selected sectors, to facilitate timely transmission of relevant data from their sectors to the national inventory at CCD MWE.

3.1.2. Operational procedures for the GHG inventory

CCD MWE in 2015 developed a 'GHG Inventory Manual for Uganda (Version 1)' to support the operationalization of the national GHGI. Training was conducted for selected emission sectors on the digital platform, that included an interactive web portal, and passwords issued to enable access to the website. The database is housed and managed by the CCD MWE.

3.1.3 Data sources

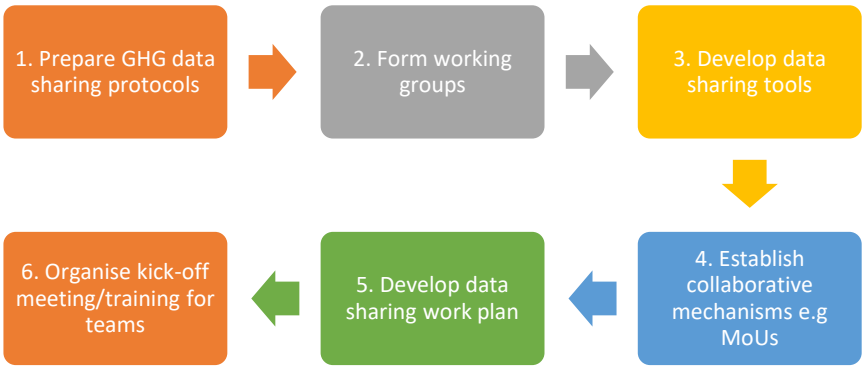
CCD MWE provides guidance on the emissions data to be shared by the sectors based on the IPCC 2006 requirements. A matrix of the data requirements and what is available for sharing across the selected sectors is presented as Annex 1 of this technical guide. A data management system is crucial for developing and regularly updating national greenhouse gas inventory, which is a foundation to the national GHG mitigation efforts[12].Data sharing is a component of the data management system for the National GHG inventory. A data management system ensures aggregation and storage of activity data, emission factors, and calculated emission totals, analysis and documentation of procedural information and published national inventory methodologies. Within the data management system, quality assurance and quality control are facilitated, and the lead agency (CCD-MWE) is responsible for the reporting to the UNFCCC.

[12] WRI 2015, Data Management Systems For National Greenhouse Gas Inventories: Insights From Ten Countries (Working Paper).

4.0 A guide to GHG data/information sharing

Uganda's GHG data landscape has evolved over the past 5 years as a result of increased investments in GHG infrastructure and management processes by MWE, with the aim to improve transparency reporting to the UNFCCC. The CBIT project has focused on strengthening institutional arrangements for GHG data sharing and this technical guide is intended to facilitate this process. GHG data/information sharing practice is guided by two main processes; (i) Planning and (ii) Implementation of GHG data sharing arrangements.

A. Planning for GHG data sharing



4.1 Planning

4.1.1: Step 1: Preparation of GHG Data sharing protocol

Key elements of the Data Sharing protocol (DSP):

i. Legal framework/context
ii. Information covered by the protocol
iii. Responsibilities for data sharing
iv. Restrictions on use
v. Generic Security
vi. Information quality
vii. Training
viii. Individual responsibilities
ix. Review arrangements

The term 'data protocol' refers to a standard set of rules that allow electronic devices to communicate with each other. These rules include what type of data may be transmitted, what commands are used to send and receive data, and how data transfers are confirmed (The Tech Terms Computer Dictionary). The data sharing protocol in the same vein is developed as a framework by the participating institutions, on what data to share, and the tools that will be used to transmit and confirm receipt by the parties. Sector institutions are encouraged to prepare data sharing protocols to guide and facilitate the data management aspects of the data sharing process. An example of a data sharing protocol is provided as Annex 2 of this guide.

Key definitions and descriptions in the DSP

- **Generic security:** Refers to measures that should be considered in maintaining physical security through servers and computer hardware in a secure location with stringent access control. Best practices such as use of firewalls, Secure Socket Layer (SSL) and Virtual Private Networks (VPN) should be ensured by all the participating institutions in data sharing as part of the overall security plans.

CCD MWE is operating a centralized database as a depository for all emissions data from the selected sectors, and generic security should therefore be observed. Multiple access through sector login arrangements must be kept secure to reduce on illegal access. Data security at sector level is equally important and each sector should provide for a data backup system that should be well secured. The sectors and CCD-MWE must also be cautious of the local factors that jeopardize the security in relation to data sharing.

These may include vulnerability of technologies (mobile phones, whatsapp, Facebook and satellites) used in GHG data collection, storage and sharing/transfer.

Secure communication: Passwords provide barriers between information and unauthorized persons that may wish to read, modify, or destroy the data without permission. Therefore, for effective and secure communication, CCD MWE and the sector institutions should ensure secure passwords and emails for sharing data and information within and across the sectors.

- **Training:** The staff involved in data sharing process are expected to be trained to a level that enables them to conduct their roles and responsibilities confidently, efficiently and lawfully. Collaboration in the development and delivery of training among the sectors, as well as their full participation should be a priority in order to minimize the costs associated with training. CCD MWE is expected to take full responsibility to organize trainings based on the UNFCCC reporting requirements and in consultation with the participating sectors.
- **Data and Information quality:** Data and information being shared is expected to meet the standards as set by CCD MWE as the lead agency. The data is expected to be complete, accurate, up to date and in compliance with the IPCC reporting requirements. A data and

information quality strategy is recommended, and the enabling policy and technical processes should be in place to enhance the required quality of the data.

4.1.2Step 2: Formation of Working Groups

The MWE draft National MRV framework for GHG defines the sectoral structure and the required commitment by the different sectors to contribute to the national GHG inventory. A technical working group is provided for the GHG Inventory and coordinates inputs from the sector institutions, think tanks and thematic working groups.

Table 2:Summary of roles and responsibilities for the GHG Inventory and data sharing

Institution	CCD MWE	Sector Institutions as GHG data suppliers
Key roles	i. Provide clear guidelines on GHG data requirements as per IPCC and national reporting requirements. ii. Prepare a clear timeline for the preparation and sharing of data and information from the selected sectors. iii. Facilitate the relationship with GHG data supply institutions through instruments such as MoUs for data sharing and exchange. iv. Support the development of methodologies, protocols and tools for data sharing. v. Responsible for database management, planning and improvement. vi. Overall planning, coordination, management and technical oversight of data and information sharing process. vii. Management of MoUs and ensure revisions if necessary. viii. Conduct QA/QC activities. ix. Reporting and Communication with UNFCCC. x. Training of data providers, archivers, ICT and statisticians in data formats, sharing platforms like databases, portals and QA/QC required by UNFCCC.	a. Data planning and management, b. Provision of high-quality GHG data in a timely manner. c. Timely delivery of data in appropriate format d. Management of internal data acquisition and processing, QA/QC requirements e. Communication with CCD-MWE
Capacity requirements	i. Technical and administrative expertise, as well as formal government authority ii. Technical knowledge of the UNFCCC data and reporting requirements and IPCC methodologies	Technical skills, legal authority to improve and enhance data collection

	iii.	Capacity to coordinate and lead the process of data sharing	
	iv.	Technical skills to review the GHG data shared	
Expectations for all	I.	Each institution is responsible for ensuring that their institutional and security measures protect the lawful use of information shared.	
	II.	Institutions will ensure a reasonable level of security for shared information, personal or non-personal, and process the information accordingly.	
	III.	Institutions are expected to promote staff awareness of the major requirements of information sharing.	

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4.1.3 Step 3: Data Sharing Tools

(a) Data sharing platforms

Data sharing is effective and efficient through implementation of data sharing platforms. Suitable data sharing should be flexible in a way that it is easy and quick to adapt to new and different situations and extensible; i.e. incorporate new innovations without substantial impact on the current system or workflow[13].

CCD MWE introduced a web-based portal to facilitate emissions data sharing with the sectors, and the sector institutions were availed passwords to access the portal. Reports from the sectors and CCD confirmed the limited use of the platform by the sectors. Reasons cited include staff turnover in the sector institutions, and not sufficient understanding of the transmission process and requirements. Therefore, it is important that the factors limiting use of the portal are addressed by CCD MWE, including improving online interaction, and refresher trainings. CCD may also consider adopting emails and physical meetings to enhance engagement with the sectors. Other data sharing tools include online transmission/exchange, publications such as fact sheets and data sharing templates could also be explored.

An example of a data sharing template for the different selected key emission sectors is shown in Table3 below. The frequency for activity processed data submission will be agreed between each sector and the CCD-MWE in the workplan as stipulated in the Memorandum of Understanding (MoU).

[13]Global Food security cluster. Field Guide to Data Sharing. UN OCHA. https://fscluster.org/sites/default/files/documents/field_guide_to_data_sharing.pdf

Table 3. GHG data sharing template

Sector	*Data type*	*Responsible person to submit*	*Person to receive*
Agriculture	Activity data	Determined by sector	CCD-MWE
	Processed data	Determined by sector	CCD-MWE
Forestry	Activity data	Determined by sector	CCD-MWE
	Processed data	Determined by sector	CCD-MWE
Waste	Activity data	Determined by sector	CCD-MWE
	Processed data	Determined by sector	CCD-MWE
Transport	Activity data	Determined by sector	CCD-MWE
	Processed data	Determined by sector	CCD-MWE
Energy	Activity data	Determined by sector	CCD-MWE
	Processed data	Determined by sector	CCD-MWE

4.1.4Step 4: Establishing Collaborative Mechanisms

It is essential for selected key emission sectors to examine what type of legal basis would be most useful to underpin the data and information sharing to CCD-MWE and across the sectors. One of the legal instruments used for data and information sharing is the Memorandum of Understanding (MoU) and or Data sharing agreements. The MoU is a binding legal framework which formally covers the regulations, roles and responsibilities for the different selected key emission sectors and other partners involved in data and information sharing process[14].

The sectors may also identify suited legal instruments to use for sharing intra sectoral data. For example, Letter of Agreement, Data Requisition letters may also be used to enhance and ensure continuous flow of data and information sharing within and amongst institutions in a particular sector. For example, NEMA can develop a letter of agreement with KCCA to share city waste data which will subsequently transmitted by NEMA as the waste sector lead to CCD-MWE data repository. However, there are some sectors that may not require letter of agreements to share the data. This kind of free data flow is also allowed as long as there is no conflict of interest.

Key elements of a data sharing MoU/agreement

[14]Prencipe, L.W. 2001. Understanding memorandums of understanding (MOUs). *https://www.itworld.com/article/2798295/business/understanding-memorandums-of-understanding--mous-.html.*

The following should be addressed in the MoU/data sharing agreement; the purpose, organizations involved, data items to be shared, basis for sharing, access and data ownership, and data governance including the data sharing tools and systems. An example of a MoU is provided as Annex 3. In the development of the data sharing MoUs between CCD-MWE and the sectors under the CBIT Project, the following elements were considered;

i. The legal basis for provision of the data is determined, the purpose is defined as well as and the timelines for submission of the data to the lead agency that are also legally determined (i.e. based on the UNFCCC reporting timelines).
ii. A description of the institution (s) responsible for the GHG data and information sharing and the role and relationship with other contributing institutions.
iii. The lead agency maintains a significant degree of control over the data and information sharing preparation and transmission process.
iv. The lead agency undertakes to keep data labelled by the institution as confidential.
v. Terms and conditions for GHG data and information sharing are clearly outlined and understood by each contributing sector and sectors reserve the copyright for data ownership and use rights. For example, right to information access, right to correction of incorrectly captured data and the methods of data access.
vi. Penalties to contributing institutions and the lead agency should be outlined and agreed upon in case of any breach of the MoU, for instance, right to claim compensation for any breaches of policy.

4.1.5Step 5: Data sharing workplan

Timely data sharing is vital for efficient GHG monitoring, reporting and review at national and international level for the country. To effectively share the GHG data and information, the GHG teams should clearly define the core activities and schedule for GHG reporting for the specified periods by developing a work plan. The work plan should be revised and updated annually, and mainstreamed in the sector plans of the participating sectors to ensure sustainability of the data collection and sharing process. A template for a work plan is provided as Annex 5, while a schedule of the CCD-MWE reports as required by the UNFCCC is included as Annex 6.

4.2 Implementation of GHG Data Sharing Arrangements

Data sharing planning is a critical phase of the data sharing process, and this primarily spells out the governance elements of the data sharing process, and provides for the necessary tools to operationalize the process of data sharing. Implementation of the data sharing arrangement is

therefore a follow-on activity after the planning phase, and this predominantly is a data management process. This phase includes 3 main activities; Determining data availability, reviewing its quality and requests for data, and finally Determining the methodology for sharing the data.

Figure 2. Implementation arrangement for GHG data sharing

4.2.1 Step 1: Determine data availability

Determining data availability in each participating sector is a first step in the data sharing process. Data availability can be notified by the data provider through sharing the metadata with the recipient. CCD MWE is the main recipient of the emissions data, and the sectors are therefore obliged to develop and share their metadata.

Data type	Data collection methods and resolution	Formats	Accuracy level	Data gaps

Figure 3: Example of metadata matrix

The metadata matrix should be updated whenever any of the data descriptive tags is changed or improved.

Table4 shows data required as per IPCC and data available in each of the contributing sectors based on stakeholder consultations in the respective sectors.

Table 4. Data availability in each selected sector

Sector	Activity Data available	Processed data (reports)	Data owners
Agriculture	Livestock numbers	Livestock Census Reports	Uganda Bureau of Statistics (UBOS) and MAAIF
	Livestock breeds		
	Livestock feeds		
	Livestock management systems		
	Feedstock management systems	Study reports	MAAIF
	Acreage under paddy rice	FAO Statistical Reports	Food and Agriculture Organisation (FAO)
	Fertilizer use	Import statistics	Uganda Revenue Authority (URA)
	Agricultural Lime		
	Soil amendments (organic and Inorganic)	Soil amendments (organic and Inorganic)	
	Water management in Rice	Study reports	National Agriculture Research Organization (NARO)
	Area under managed soils		
	Soil types	Soil maps	
Forestry	Land cover/land use data	Biomass maps and reports	NFA
	Area of degraded and restored forest		
	Volume of illegal impounded timber	Enforcement reports	NFA
	Volume of illegal impounded charcoal	District enforcement reports UBOS reports	UBOS, District LGs
	Area burnt, fuel available for burning and EF burning by land strata	District reports	District LGs
Transport	Aggregate fuel consumption domestic and international (LTO and cruise) and average emission factors	National Energy statistics and Energy Balance Reports	Civil Aviation Authority, UBOS, MEMD
	Fuel consumption by fleet category – data on fuel and vehicle imports	Import statistics, vehicles estimates in Kampala city	UBOS, URA Kampala City Council Authority
	Fuel consumed by water transport – data not available	None	MoWT
	Fuel consumed by rail transport – data not available	None	Uganda Railways Corporation
Waste	Volume of Municipal solid waste (MSW) collected	Weight of MSW collected	NEMA, Uganda Bureau of Statistics, KCCA, and key municipalities and town councils
	Weight of MSW collected	Weight of MSW generated	
	Weight of MSW generated	Collection rates of MSW	
	Density of MSW collected	Generation rates of MSW	
	Composition by fraction of MSW	Coverage of W.W services	

	Number of vehicles transporting MSW	Weight of eco from MSW emission reduction	
	Number of vehicles transporting MSW (transporters and operators)		
	Number of waster handlers licensed		
	Number of cell pool operators licensed		
	Volume of Waste Water (W.W) generated	Peak volume of W.W generation	Directorate of Water Resources Management (DWRM), National Water and Sewerage Corporation (NWSC)
	Volume of W.W collected	Off peak volume of W.W generation	
	Quality of W.W received	Peak weight of MSW generated	
	Volume of W.W sludge generated	Peak weight of MSW collected	
	Quality of the effluent	Off peak weight of MSW collected	
	Volume of effluent discharged	Off peak weight of MSW generated	
Energy	Aggregated fuel consumption	Energy Balance Reports	Ministry of Works and Transport (MoWT), Uganda Revenue Authority (URA)
	Biomass (Charcoal, biogas, briquettes)	Biomass Reports MEMD Annual reports	National Forestry Authority, MEMD
	Electricity generation	MEMD Reports on energy generation and use	Electricity Regulatory Authority (ERA), Uganda Bureau of Standards (UBOS), UMEME Ltd, Uganda Electricity Transmission Company Limited
	Manufacturing industries and construction	MEMD Reports on energy generation and use	Ministry of Trade Industry and Cooperatives (MTIC)

4.2.2 Step 2: Review quality of the data

A. Quality assurance (QA)/quality control (QC)

A management system that ensures adherence with UNFCCC quality requirements expressed as transparency, consistency (internal), comparability (external), completeness and accuracy should be established. Without this, any decision made on the data or information may be flawed[15]. It is the responsibility of CCD MWE to provide guidance to the contributing institutions in preparing quality GHG data as required by UNFCCC.

Box 1. Definition of QA and QC according to IPCC

- *Quality control (QC): a system of routine technical activities implemented by a team to measure and control quality of data. The activities include general methods like accuracy checks on data acquisition and calculations, and the use of approved standardized procedures for emission and removal calculations, measurements, estimating uncertainties, technical reviews of activity data, and emission factors, archiving information and reporting.*
- *Quality assurance (QA): a planned system of review procedures conducted by independent experts following the implementation of quality control procedures.*

The staff responsibility for QA/QC should rely on a specialist dedicated fully or partially to this task, positioned at the lead institution and supported by a permanent system with control points and procedures to assure a standard quality in the GHG team office and also for data providers.

Scope of QC:

i. QC of information from suppliers.
ii. QC of the processing of datasets, archiving of correct files, edition of the reports and assuring the references to all the information presented assuring transparency.
iii. Responsibility in the continuous improvement process.
iv. Updating of new knowledge and procedures on GHG data calculation or modalities for reporting.
v. Creating a channel for data sharing with aim to improve the next reporting cycle.

A QA/QC plan is required and comprises the following elements for effective functioning:

i. Technical personnel responsible for coordinating QA/QC activities

[15]Todorovaetal,2003. National greenhouse gas inventories: application of the principles of transparency, consistency, comparability, completeness and accuracy.

ii. General QC procedures
iii. Source-specific QC procedures
iv. QA review procedures
v. Schedule for conducting QA/QC activities
vi. Reporting, documentation and archiving procedures

The specific roles for the QA/QC coordinator in collaboration with the GHG data compiler include;

i. Review changes in methods and assumptions used in data collection and processing
ii. Review previous estimates and methodologies
iii. Cross-check the tools, methods and information used in the shared GHG data for each contributing sector
iv. Review reliability of applied methodology i.e. check estimations and statistical procedures, review the quality of the outputs using sensitivity analysis.
v. Review the workflow and methodologies of the contributing institutions/data providers
vi. Revise MoUs, if necessary

B. Monitoring and Evaluation (M&E)

Monitoring and Evaluation (M&E) of the data sharing process involves defining and implementing a continuous improvement plan that complements the QA/QC process and the MoU Agreement. The lead institution (in this case CCD MWE) should be responsible for developing an M&E plan and its implementation in consultation with the contributing institutions in the data and information sharing arrangements. M&E allows the GHG data sharing teams to take into account the reviews or the capacity building needs identified from the contributing institution staff, with a vision to improve the data sharing process, thus achieve an improved understanding of the emissions and trends of the country and across sectors.

Box 2. Monitoring and Evaluation Activities

- *Establish priorities and a time line for activities for improvement of the data and information sharing process as part of the plan*
- *Implement activities necessary for the identified priorities e.g. for analyzing certain source categories (like waste composition in a specific year)*
- *Establish and maintain a documentation and archiving systems*
- *Track and document the improvements made on data sources used, updated emission factors*

or methodologies applied.

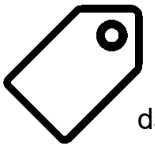
- *Revise the Memorandum of Understandings (MoUs), if necessary.*

4.3 Step 3: Determine the Methodology

4.3.1. Data formats

Data sets across sectors may or are not standardized nor are the mechanisms for sharing the data. In the best case, this results in a significant delay in sharing data into a common database or portal. In the worst case, information is simply not shared at all, leaving gaps in the understanding of the field situation.

Some of the data and information formats which could be used for data sharing include Excel, text files, reports for processed data, and geo-referenced maps and shape files for example land cover/land use data and biomass.



Before sharing the data, an appropriate meta-data needs to be forwarded inter and intra sector levels. Meta-data describes the meaning of terms, meaning of values, data formats, methods and units used for data measurements and processing, magnitude of data gaps and percentage of accuracy etc. For the spatial maps, there should be a disclaimer covering the accuracy of the data. Meta data is important to ensure that data copyrights are preserved and any specifics on data utilization are maintained.

4.3.2 Data sharing tools

Data sharing tools may include customized database, customized Excel spread sheet and uses Visual Basic for Applications (VBA) macros, customized Access databases.

4.4 Ensuring sustainability in GHG data and information sharing

After the technical team for data sharing has been set up or strengthened, further consideration should be given to how the data sharing team and process can be sustained. Sustainability for the team and the data sharing process is always confronted with a number of challenges, which include among others, political support and, correspondingly, allocation of financial resources.

Political support ensures continuous and sustainable operation of the team and the data sharing process more so in budget allocation and sharing of data and information from the respective contributing sectors. Lack of such support can decisively affect the sustainability of the data sharing process and the technical team (compilers, QA/QC coordinators, ICT etc.). Therefore, to encourage political support for this process, the lead institution should aim at continuously demonstrating the benefits of sharing GHG data and information from the different sectors at the national level to the targeted stakeholders (such as policy makers at the different government levels and sectors).Another challenge affecting sustainability of data sharing process may include the high staff turnover amidst the scarce technical staff. Institutions should retain the human resources and building their capacity and also developing alliances within institutions to maintain the support needed.

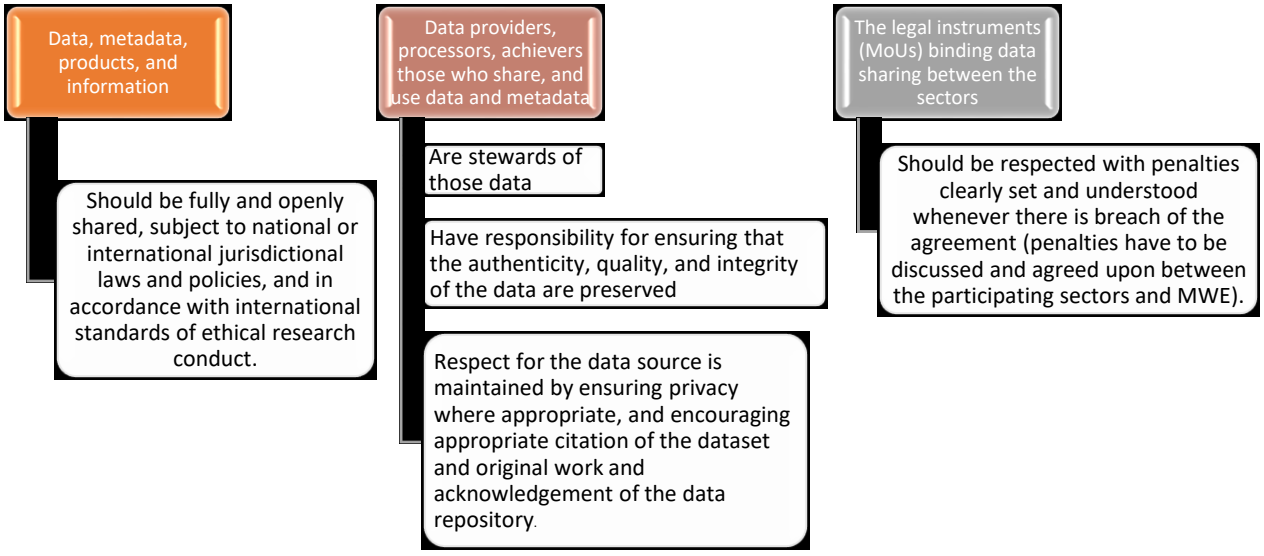


Figure 2. General principles for sustainable data sharing among institutions

Annexes

Annex 1. Data to be shared per sector according to the IPCC requirements

Annex 1.1 Energy sector

Activity data	IPCC Requirement
Manufacturing industries/construction	Consumption (Mass or Volume) and Conversion factor (TJ/UNIT output)
Manufacturing Industries \Wood and Wood Products (Biomass-charcoal, biogas and briquettes)	Consumption (Mass or Volume) and Conversion factor (TJ/UNIT output)
Manufacturing Industries \ Food Processing, Beverages, Tobacco	Consumption (Mass or Volume) and Conversion factor (TJ/UNIT output)
Manufacturing Industries \Textile and Leather	Consumption (Mass or Volume) and Conversion factor (TJ/UNIT output)
Manufacturing Industries \ Construction\Pulp, Paper, Print	Consumption (Mass or Volume) and Conversion factor (TJ/UNIT output)
Processed data	
Energy balance	Reports
Ministry of Energy annual reports	Reports (data collected quarterly)

Annex 1.2 Transport sector

Activity data	IPCC Requirement
Transport/Civil Aviation	Aggregate fuel consumption (LTO and cruise) and average emission factors
Transport/road	Fuel consumed by fleet category (distance and or tonnage)
Transport/water and railway or others	Fuel consumed by water transport category and others (distance and or tonnage)

Annex 1.3 AFOLU sector

Activity data	IPCC Requirement
Land conversions (land use/land cover data or maps)	Spatially explicit data on land conversions and biomass stocks
Land remaining the same land	Wood extraction and or change in biomass in land remaining the same
Aggregate sources burning	Area burnt, fuel available for burning and EF burning by land strategy
Livestock enteric fermentation	Livestock numbers (annual) disaggregated by key breed categories
Livestock manure management (CH_4 and N_2O direct)	Manure management systems disaggregated by key breed categories
Aggregate sources lime application	Annual amount of lime application
Aggregate sources urea application	Annual amount of urea application
N_2O from managed soils (direct)	Annual organic and chemical fertilizer application (Tones) and N fraction in fertilizer
N_2O from managed soils (indirect)	Annual organic and chemical fertilizer application (Tones) and fraction that volatizes
N_2O from manure (indirect)	Annual nitrogen excretion and fraction that N that volatizes
CH_4 rice cultivation	Annual rice area cultivated or harvested by flood management and agricultural inputs

Annex 1.4 Waste sector

Activity data	IPCC Requirement
Solid waste\ Managed disposal sites	Degradable Organic Carbon (DOC) and Methane fraction of waste by population and waste type (food, paper, textile, sludge, industrial waste), quality and volume of effluent, waste water received and collected, volume of waste water and waste water sludge generated.
Solid waste\ Unmanaged disposal sites	Degradable Organic Carbon (DOC) and Methane fraction of waste by population and waste type (food, paper, textile, sludge, industrial waste), quality and volume of effluent, waste water received and collected, volume of waste water and waste water sludge generated.
Solid waste\ Uncategorised disposal sites	Degradable Organic Carbon (DOC) and Methane fraction of waste by population and waste type (food, paper, textile, sludge, industrial waste), quality and volume of effluent, waste water received and collected, volume of waste water and waste water sludge generated.
Solid waste\Biological treatment	Waste category amount (food, paper, textile, sludge, industrial waste) treated (mainly be municipalities) Anaerobic and Composite
Waste incineration	Amount of waste incinerated by (food, paper, textile, sludge, industrial waste, nappies) fraction of dry matter content, fraction of carbon in dry matter, fraction of fossil carbon in total carbon
Open burning	Population by region, fraction of population that burn waste, Kg waste /person/day, fraction burnt (compared to treated), days in a year
Waste water\Treatment and discharge (domestic)	Low \ High income rural and urban (discharge pathway i.e. sewer type, latrine by depth, latrine type, lagoon type)
Waste water\Treatment and discharge (industrial)	Waste water generated (m^3) per (t) of industrial products (Alcohol refining, Beer & Malt, Pulp and Paper, Soap and detergents, coffee, dairy products, fish, poultry, organic chemical, Plastics and resins, starch production, Sugar refining, vegetable oils, vegetable, fruits & juices, wine and Vinegar)

Annex 2. An example of a GHG data sharing protocol

CONTENTS

1. PURPOSE OF THE PROTOCOL

Local agencies are increasingly working together. To work together effectively, agencies need to be able to share information about the services they provide and the people they provide these services to.

This agreement has been developed to ensure Information Sharing for the purpose of the [INSERT NAME OF PROJECT/ACTIVITY], has an effective governance structure. The agreement has been produced to assist……. and [INSERT PARTNERSHIP NAME] partners implement the required processes to [INSERT THE PURPOSE OF THE AGREEMENT] within the study design, across [DESCRIBE AREA / SCOPE OF PROJECT].

This agreement does not give carte blanche licence for the wholesale sharing of information. Information sharing must take place within the constraints of the law, relevant guidance, service specific requirements and is underpinned with the ethos of informed consent and client confidentiality being tantamount to any information sharing between agencies.

This protocol will be underpinned by the operational agreements as designed to meet the specific needs of the project study and to assure any information sharing is undertaken within the realms of current legislation and legal frameworks.

2. PRINCIPLES

Thus, this agreement outlines the principles and operational guidelines for how information and client data is securely managed across…….. and [AREA NAME] partners to ensure the effective implementation and evaluation of the [NAME PROJECT / ACTIVITY].

The following key principles guide the sharing of information between …… and [AREA NAME] partners for the purpose of the [NAME PROJECT / ACTIVITY]:

2.1 Partner agencies endorse, support and promote the accurate, timely, secure and confidential sharing of both person identifiable and anonymised information for the sole purpose of the [NAME PROJECT / ACTIVITY].

2.2 Agencies are fully committed to ensuring that if they share information it is in accordance with their legal, statutory and common law duties, and, that it meets the requirements of any additional guidance.

2.3 All agencies have in place policies and procedures to meet the national requirements for Data Protection, Information Security and Confidentiality. The existence of, and adherence to, such policies provides all agencies with confidence that information shared will be transferred, received, used, held and disposed of appropriately.

2.4 Agencies acknowledge their 'Duty of Confidentiality' to the people they serve. In requesting release and disclosure of information from other agencies, employees and contracted volunteers will respect this responsibility and not seek to override the procedures which each organization has in place to ensure that information is not disclosed illegally or inappropriately. This responsibility also extends to third party disclosures; any proposed subsequent re-use of information which is sourced from another agency should be approved by the source organization.

2.5 An individual's personal demographic information will only be disclosed to facilitate smooth implementation of the [PROJECT / RESEARCH]. For all other purposes, information must be anonymised.

2.6 Where information is shared, to facilitate the smooth implementation of the project only that which is needed and relevant will be shared. This will be on a "need to know" basis.

2. 7 Partner agencies will ensure that all relevant staff are aware of, and comply with, their responsibilities in regard both to the confidentiality of information about people who are in contact with their agency and to the commitment of the agencies to share information.

2.8 All staff will be made aware that disclosure of personal information, which cannot be justified on legal or statutory grounds, whether inadvertently or intentionally, could be subject to disciplinary action.

2. 9 Partner agencies are responsible for putting into place effective procedures to address complaints relating to the disclosure of information, and information about these procedures should be made available to service users.

3. CONSENT

3.1 To facilitate effective success of the…….[INSERT NAME OF PROJECT / ACTIVITY], explicit client consent to participate is mandatory. As a **minimum**, individual participants will be informed that information will be shared across partner agencies.

3.2 For the purpose of this study consent will be sought [INSERT HOW CONSENT WILL BE SOUGHT], both written and verbal, being supported with written information regarding the [NAME OF PROJECT / ACTIVITY].

3.3 To assure explicit consent, the following must be sought from the participants:

- Consent to participate in the [PROJECT/RESEARCH]
- Consent for partner agencies to share both information and documentation across partner agencies and domains, in order to implement the necessary contacts required for the project
- Consent for information to be stored by [NAME OF RELEVANT ORGANIZATION]
- Consent to be contacted by partner agencies from [NAME OF ORGANIZATION], for the purpose of the project.
- Consent to the right to withdraw from the study at any point
- Further consent from participants (and on behalf of dependent family members) must be sought prior to any client information that would allow individuals other than those involved in undertaking the research to identify the client being included within the [NAME OF RESEARCH / ACTIVITY] (APPENDIX 1).

4. PROCESS

The project study comprises of ….. [INSERT DETAILS OF THE PROJECT]. The initial contact to families / individuals will be made by [INSERT DETAILS OF THE PROJECT].

4.1.1 Data Collection

[DESCRIBE HOW DATA WILL BE COLLECTED]. This will be used to [DESCRIBE HOW THIS INFORMATION WILL BE USED / WHAT ARE THE INTENDED OUTCOMES]

[DESCRIBE IN DETAIL THE MECHANISMS FOR ACHIEVING THE ABOVE]

4.2 Data Storage

A completed [DESCRIBE DOCUMENTATION] will be entered onto a [INSERT NAME OF] database and thus shared with [WHO WILL HAVE ACCESS TO THE DATABASE].

Emergent themes will be analysed within the study evaluation stage and provide recommendations for future multi agency [WHAT WILL THE INFORMATION INFORM].

4.3 Data Sharing

As discussed, demographic information and data from [HOW WAS THE INFORMATION COLLECTED] will be shared with the [INSERT NAME OF] database. This agreement will ensure that partner agencies endorse the security and confidentiality constraints placed upon sensitive demographic information and data.

5. AUDIT AND REVIEW

All agencies accessing any client data must have appropriate governance and risk assessment measures in place, to assure the safe storage, access and utilization of client identifiable data. Policies should be available for audit purposes with evidence of clear review dates.

Where not already in place, processes will be set up in each agency to adopt a risk management approach to breaches/problems in relation to the implementation of this agreement.

6. SUPPORTING POLICIES, PROCEDURES AND GUIDANCE

Supporting policies

For members of the public and staff from the agencies participating in the [PROJECT] to have confidence that information sharing takes place legally, securely and within relevant guidance, all agencies must demonstrate evidence of relevant policy guidance which meet the requirements for:

- Data Protection
- Confidentiality
- Information Security
- Caldicott principles

These policies must cover manual, verbal and computer-based information.

7. CONCLUSION

To assure the effective implementation and evaluation of the[INSERT TITLE OF RESEARCH / PROJECT], timely sharing of information is a key contributing factor.

This agreement acknowledges and provides a means whereby members of the public, staff and the agencies can be confident that where information is shared it is done so appropriately and securely for the sole purpose of the pilot and will not be utilized outside the scope of the project.

Annex 3. An example of Memorandum of Understanding(*Source: Elena Scherer, 2017, Background Information for Transport Authorities*, *GIZ*)

draft sample data-sharing agreement

(as of October 17, 2007)

Cooperation Agreement

Between

Federal Republic of Germany

represented by the Federal Ministry of [e.g. Economy and Technology] and by the Federal Ministry for the Environment, NatureConservation

and Reactor Safety

[address]

and represented by the Federal Environmental Agency [address]

and

the <institution>

[address]

Hereafter referred to as "<institution>"

following cooperation agreement for the collaboration and exchange of data for the national report of emission is concluded

Preamble

1. The Federal Republic of Germany is bound by the United Nations Framework Convention on Climate Change, the Kyoto Protocol and the decisions adopted in this framework, as well as at European level by Decision 280/2004 / EC to establish a national greenhouse gas inventory [hereafter referred to as ‚national inventory ']. The national inventory must be updated annually and sent to both the European Commission and the secretariat set up under Article 8 of the Framework Convention on Climate Change. The national inventory is prepared by the Single National Entity of the National System for Emission Inventories at the Federal Environment Agency [hereafter: ‚Single National Entity '].

2. *[The Federal Republic of Germany is further bound by the 1979 United Nations Convention on Long-Range Transboundary Air Pollution (LRTAP Convention) and the protocols thereto, and at European level by Directive 2001/81 / EC (hereafter „NEC"-Directive) of 23.10.2001 on national emission limits establishing a national inventory of air pollutants [‚national inventory on air pollutants within the meaning of the Geneva Air Pollution Convention and the NEC Directive].*

In this case, the following rules must also be supplemented by the additions in italic and square brackets: § 1 section 1; § 3 section 1 sentence 1; § 5 section 2, § 7 section 1, § 8 section 2; Otherwise, the additions are to be deleted before the conclusion of the agreement.

3. Reporting under the Kyoto Protocol, decisions made under it and also Decision 280/2004 / EC is organized in the National Emission Inventory System. The coordination, management and archiving of the data and documents as well as the preparation of the national inventory including the inventory report is carried out by the Federal Environmental Agency as the Single National Entity.

4. Various data are required to create national inventories. These are not only numbers to be reported, such as activity data and emission factors, but also information about these numbers, such as, for example information on calculation methods, uncertainties, recalculations,

measures of quality control and assurance, times and frequencies of transmission and archiving.

5. No duty to provide information to the <institution> [or its members] on the basis of a law. Is intended by the parties entering into this Agreement

6. The <institution> is [placeholder for a more detailed description of the institution]

7. After concluding this agreement, the <institution> will be referred to third parties as the „official partner of the Single National Entity for emissions reporting of the Federal Republic of Germany, represented by the Federal Environment Agency “(in short: the official partner of the Single National Entity).

§ 1

Definitions

1. For the purposes of this agreement, data is the information listed in the annex, whether in the form of numbers or verbalized information used to explain the numbers.

2. In accordance with the definitions in § 3 section 4 of the Federal Data Protection Act, “processing” within the meaning of this agreement is the storage, modification, transmission, blocking and deletion of data. Specifically, regardless of the methods used:

a. Storage: Recording, collecting or holding data on a data carrier for the purpose of its further processing or use

b. Modification: Changing the content of stored data,

c. Transmission: Disclosure of stored or computer-generated data to a third party in such a way that

(1) the data will be passed on to the third party or

(2) the third party sees or retrieves data held available for inspection or retrieval,

d. Blocking: Tagging of stored data to limit its further processing or use

e. Deletion: Redaction of stored personal data.

3. In accordance with the definitions in § 3 (5) of the Federal Data Protection Act, utilisation within the meaning of this agreement is any use of data, as far as it is not about processing.

§ 2

Data transmission

1. The <institution> annually submits to the Single National Entity, free of charge, the data listed in the annex for the previous year until [date].

2. The <institution> submits to the Single National Entity the data to be provided in accordance with Paragraph 1 [of this section] in an appropriate manner, in accordance with the guidelines referred to in § 5 (3) sentence 4 of this Single National Entity Agreement.

3. The <institution> commits to work toward the conclusion of agreements concerning the delivery of data between the <

institution> and its members, insofar as the data to be provided pursuant to section 1 cannot be provided by the <institution>. The agreements of the <institution> with its members pursuant to sentence 1 should be concluded as far as possible with the same content as this agreement.

Cooperation

1. The parties commit to cooperation, in particular to exchange the information necessary for the preparation of national inventories [and national inventories on air pollutants as defined by the Geneva Air Pollution Convention and the NEC Directive]. [Details regarding the scope, content and organization of cooperation under this agreement are coordinated by the parties respective to their competence.]

2. The Federal Republic of Germany informs the <Institution> within the framework of an annual meeting of the official partners of the Single National Entity at the invitation of the National Coordination Office.

§ 4

Quality control and quality assurance

1. The <institution> is responsible for quality control of the data to be transmitted under this Agreement.

2. The Federal Republic of Germany is Authorised by the Single National Entity to control the data quality and to ensure quality in the preparation of the national inventories and the selection of data sources [as well as in the preparation of national inventories of air pollutants as defined by the Geneva Air Pollution Convention and the NEC Directive].

3. For quality control and assurance, the international obligations, in particular those of the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories and the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories are to be considered as a quality standard. In doing so, the <institution> and the Single National Entity shall apply the provisions of the Coordinating Committee in accordance with the State Secretary Decision of 5 June 2007 [possibly insert a more precise designation with a number or similar] on the minimum quality control and assurance requirements. These specifications are intended to ensure a comparable and consistent application of the international specifications for German inventories. The international commitments and the Coordinating Committee ‘s decisions are prepared by the Single National Entity and made available to the <institution> as a guide

4. If the data provided by the <institution> does not meet the requirements of section 2, the <institution> is obliged to rectify this. The Single National Entity may set a reasonable deadline for rectification, taking into account the timely completion of the national inventory.

5. [Placeholder for special requirements in individual cases]

§ 5

Contact Person

1. The <institution> shall name the Single National Entity [for each subject], its contact persons and representatives, including any auxiliarydata, in particular address, telephone number, fax and e-mail.

2. The <institution> undertakes to obtain written consent from the data subjects prior to the transmission of personal data to the SingleNational Entity, after having comprehensively informed them about the extent of transmission, use and further processing by the SingleNational Entity, in particular submission to third parties for further processing according to § 7.Insofar as changes in the processing and use of personal data result after the consent of the persons concerned, the <institution> is obligedto obtain the consent of the person concerned.

3. For its part, the Federal Republic of Germany appoints contacts to the <institution>, including the respective auxiliary data.

4. The parties undertake to inform the other party immediately of changes in the responsibilities of the contact persons and the auxiliary

data.

§ 6

Data processing and data usage

1. 1. In the context of emissions reporting, the Federal Republic of Germany is, in principle, Authorised by the Single National Entityto process and use the data transmitted by the <institution>, insofar as this is necessary for the preparation of the national inventory[*and for the preparation of the national inventory of air pollutants as defined by the Geneva Air Pollution Convention and the NEC Directive*].

2. In particular, the Single National Entity is Authorised to transmit the data to specialized units of the Federal Environment Agency, otherauthorities or contract reporting entities. This also applies to the data to be kept secret according to § 7.

3. Insofar as the <institution> transmits personal data from individual member companies, it is obliged to obtain written consent from theaffected natural persons prior to transmission. The natural persons concerned must be fully informed prior to granting consent of theextent to which the data transmitted is processed and used by the National Coordination Office, in particular or transmitted to thirdparties for inventory preparation and processed and used there. Insofar as changes in the processing or use of personal data by the SingleNational Entity or third parties result after the consent of the member companies has been granted, the <institution> is obliged toobtain the consent of the persons affected in the member companies.

§ 7

Confidentiality

1. The Federal Republic of Germany undertakes to keep secret data that allows conclusions to be drawn on business and trade secrets whichthe <institution> has identified. Insofar as the Single National Entity transmits data in accordance with § 7, the Federal Republic ofGermany guarantees the secrecy of the data specified in sentence 1 by the recipients. The provisions of the Environmental InformationAct remain unaffected.

2. In publishing the national inventories [*and the national inventories on air pollutants as defined by the Geneva Air Pollution Convention andthe NEC Directive*], the Federal Republic of Germany undertakes to summarise the data to be kept secret in accordance with section 1to the extent that conclusions cannot be drawn therefrom.

3. By way of derogation from section 1, the Single National Entity may require the data to be kept secret for the purpose of a central ordetailed international inventory review in accordance with its international obligations to the expert review groups provided for inArticle8 (2) of the Kyoto Protocol. It has to mark the data to be kept secret according to section 1 as such. This marking by the SingleNational Entity triggers an internationally provided secrecy protection.

§ 8

Copyright

Without prejudice to §§ 6 and 7, the parties reserve the copyrights to the data provided by them.

§ 9

Participation in international inventory reviews

Under its obligations under this agreement, the <institution> undertakes to cooperate in the international inventory review pursuant toArticle 8 of the Kyoto Protocol. This applies in particular to the preparation of

the international inventory review by the expert reviewgroups. In the event of a central or detailed international inventory review, the <institution> is not authorized to invoke the confidentialityof trade and business secrets adverse the expert review groups. However, the <institution> should mark secret data as such. The expert review groups are obliged by the secretariat appointed by Article 8 of the Framework Convention on Climate Change to keep the correspondingly labelled data confidential.

§ 10

Data storage

1. The <institution> is required to retain the data at least until the conclusion of the last international inventory review by the expert reviewgroups after the end of the current commitment period.

2. The Federal Republic of Germany is Authorised to store the data by the Single National Entity.

§ 11

Entry into force and duration

1. This agreement enters into force on [date]. It will continue in force indefinitely.

2. The agreement can be terminated on April 1 of each year with effect for the following year.

3. The <institution> agrees, even in the event of termination, to cooperate in the execution of the contract, in particular in the context ofthe subsequent cooperation with the expert review groups.

§ 12

Final provisions

1. Existing agreements between the <institution> and the Federal Environmental Agency (e.g. on the implementation of national or internationalprograms and projects) remain unaffected by this agreement

2. The annex is an integral part of this agreement.

3. Changes, additions and the repeal of this agreement must be made in writing. This also applies to the agreement that a form other thanthe written form should be introduced.

4. Should individual provisions of this agreement be ineffective or cannot be carried out for legal reasons, this shall not affect the remainingprovisions of the agreement. The same applies to a regulatory gap. In place of the ineffective, impracticable or incomplete provision, theagreement shall be supplemented or interpreted in such a way that the aims pursued by the parties are achieved as far as possible.

5. Changes to the international or community law obligations of the Federal Republic of Germany have no influence on the effectivenessof this agreement.

6. The agreement is made in duplicate. Each party receives a copy.

Annex 4. Template for Workplan for data sharingbetween sectors and CCD

Activity	Timeline/schedule	Output	Responsibility
A. Data/Information Transmission			
A.1. Activity Data			
A.2 Processed data			
B. Training/learning events			
B.1 Training on data sharing protocols			
B.2 Workshop on new UNFCCC reporting requirements			

Annex 5: CCD MWEReporting Schedule(To be updated periodically by CCD MWE)

Report	Frequency	Data required
2. Biennial Update Reports (BURs)	Every 2 years	
3. National Communications (NCs) report	Every 4 years	
4. GHG inventory reports	Every 2 years	

Annex 6: References

Thelma Krug. 2015. GHG Inventories: Their Importance to Monitor Progress in Climate Change Mitigation. IPCC Open Symposium.

Jillian C. Wallis, Elizabeth Rolando, and Christine L. Borgman. 2013. If We Share Data, Will Anyone Use Them? Data Sharing and Reuse in the Long Tail of Science and Technology. PLoS One. 2013; 8(7)

Matthew Brack and Tito Castillo.2015. Data Sharing for Public Health Key Lessons from Other Sectors. Centre on Global Health Security

IPCC 2010, Use of Models and Facility-Level Data in Greenhouse Gas Inventories (IPCC Expert Meeting Report).

Daniel Bodansky. 2016. The Paris Climate Change Agreement: A New Hope? The American Journal of International Law. Vol. 110, No. 2, pp. 288-319

MWE (2014), Uganda Second National Communication to the United Nations Framework Convention on Climate Change, Government of Uganda, Kampala, Uganda

NRGI (2015). The Extractive Industries Transparency Initiative (EITI) Using EITI to Promote Policy Reform

MWE (2015), Uganda National Climate Change Policy, Government of Uganda, Kampala Uganda.

Government of Uganda (2019). The Data Protection and Privacy Act, Kampala, Uganda

Government of Uganda (2017) Open data policy. First draft. Ministry of Information, Communications Technology and National guidance. Kampala, Uganda.

MWE 2015, Green House Gas Inventory Manual for Uganda Version 1, Government of Uganda, Kampala, Uganda

WRI 2015, Data Management Systems For National Greenhouse Gas Inventories: Insights From Ten Countries (Working Paper).

Global Food security cluster. Field Guide to Data Sharing. UN OCHA.

Prencipe, L.W. 2001. Understanding Memorandums of Understanding (MOUs).

Sevdalina Todorova, Rocio Lichte, Astrid Olsson, Clare Breidenich. 2003. National greenhouse gas inventories: application of the principles of transparency, consistency, comparability, completeness and accuracy.

Websites

http://www.ict.go.ug/wp-content/uploads/2018/06/Open-Data-Policy-First-Draft-vX.pdf

https://fscluster.org/sites/default/files/documents/field_guide_to_data_sharing.pdf

https://www.itworld.com/article/2798295/business/understanding-memorandums-of-understanding--mous-.html.

https://pdfs.semanticscholar.org/3c30/a1bd769dee5299746e0af825c7ab4ed55fba.pdf