Sector-level MRV system for the agriculture and transport sectors

ICAT Initiative for Climate Action Transparency

Initiative for Climate Action Transparency – ICAT
Sector-level MRV system for the agriculture sector

Deliverable #2

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Introduction

This document is the second deliverable under the ICAT-Belize Phase 2 project. It supports the second output of the project which is to enhance sector-level support and integration into the national climate change MRV system for Belize.

Under ICAT Phase 1, a national MRV system was developed to track climate actions for the country. The first phase primarily focused on monitoring the progress of the Nationally Determined Contributions (NDC). The second phase of the project will expand on the functions of the system by developing and incorporating other reporting aspects for climate change. These include designing two sector-level systems (for the agriculture and transport sectors), calculating greenhouse gas emissions and removals, monitoring agricultural data and other climate change actions that may fall outside of the NDC. This deliverable focuses on the two sector-level measurement, reporting and verification (MRV) systems.

During phase 1, it was evident that some sectors were more advanced than others when it came to MRV processes for climate change data and information. The agriculture sector and the transport sector were both identified as needing more capacity building. This is both in terms of personnel and capacity, and whether the data is readily available. Hence, phase 2 of the ICAT project and its corresponding output 2 focuses on these two sectors.

As such, deliverable 2 encompasses several activities that are presented by chapter or section throughout this document. These include the review and analysis of the existing mechanisms or frameworks for the collection and management of data within the two sectors. Consultations were held with stakeholders within the two sectors to either obtain or verify existing information. Climate actions were also identified within the two sectors that are ongoing and contributes to indicators that were developed under phase 1.

Institutional arrangements are also presented based on the information collected and building on what was developed under phase 1. By enhancing the sector-level support for these two sectors and integrating their processes into the national system, Belize will have a stronger MRV system for climate change and allow more transparent and efficient reporting of climate actions. It would also enhance Belize's efforts towards the Paris Agreement in complying with the Enhanced Transparency Framework.

Existing mechanisms for data collection and management

Agriculture sector

The review of existing mechanisms and frameworks for the collection and management of data within the agriculture sector began with reviewing past deliverables under the first phase of ICAT. According to deliverable 4, which included an activity to *map existing MRV mechanisms in the relevant institutions and relevant climate change data and information currently generated*, the agriculture sector has a monitoring system called the Belize Agricultural Information Management System (BAIMS). This system records data for farmers and can be useful for policymakers. Currently, the system partially tracks non-GHG impacts such as "food security" and "biodiversity of terrestrial ecosystem". The system also collects data that is needed to calculate GHG emissions and removals. These include data for enteric fermentation, manure management, and some liming and urea application.

The BAIMS is the agriculture sector's primary monitoring database which is a web-based application that serves as a central repository for all agriculture data and is managed by the Ministry of Agriculture, Food Security and Enterprise (MAFSE). The system accurately identifies farmers and farms by georeferencing their location. It is updated with continuous production surveys used by extension officers within the MAFSE and with the support of contact farmers. This allows farmer, farm, and production data to be updated and verified.

The deliverable 4 report also identified the institutions that are most appropriate to monitor the developed indicators. There were several identified for the agriculture sector, namely:

- The Ministry of Agriculture, Food Security and Enterprise (MAFSE) (sector lead)
- Sugar Industry Research and Development Institute (SIRDI) (data provider)
- Department of Environment (data provider)
- Belize Livestock Producers Association (BLPA) (data provider)
- Caribbean Agricultural Research Development Institute (CARDI) (data provider)
- Belize Agricultural Health Authority (BAHA) (data provider)

Under phase 1 via deliverable 3, it was indicated that two GHG indicators are already monitored for the agriculture sector, these are: (1) *hectares of land converted to agroforestry/climate farming practices* and (2) *proportion of agriculture under productive and sustainable agriculture*. These can also track specific impacts of NDC actions under the agriculture sector. Likewise, these can assist in tracking emission reductions, based on a range of assumptions and emission factor generation for mitigation practices.

The monitoring capacity of the developed indicators for the agriculture sector was assessed under phase 1. The appropriate institutions to monitor indicators related to GHG emissions were the Ministry of Agriculture, CARDI and SIRDI, while for non-GHG indicators it was the Ministry of Agriculture, SIRDI and BAHA. The stakeholders in this sector stated that data sharing agreements need to be established and formalized to improve monitoring of these indicators. The agriculture sector also indicated that third-party assistance for additional data to monitor GHG emissions would be required. However, Belize is in the process of developing a climate change bill that will, among other things, make data collection and sharing mandatory hence facilitating the monitoring of all indicators for climate change actions.

Deliverable 5 of phase 1 identified sector leads for each of the reporting sectors. The Ministry of Agriculture, Food Security and Enterprise (MAFSE) was identified as the sector lead for agriculture sector. The MAFSE aims to provide an environment conducive to production and productivity development, promoting and encouraging investments and private sector involvement in agribusiness enterprises in a manner that ensures competitiveness, quality production, trade, and sustainability.

Sector leads are responsible for collecting and reporting data for estimating and reporting GHG emissions and reporting on non-GHG impacts and as well as tracking NDC actions and, therefore, has the authority to request data from supporting institutions and/or data providers within the sector.
An online platform was developed under phase 1 to facilitate the overall national MRV system for climate change. The online platform allows sector leads to upload data and information relating to climate change actions in Belize

thus creating a data centralization storage system. It also assists in facilitating reporting of climate change information.

In addition, the BLPA also utilizes a web-based system called the Belize Livestock Registry (BLR). The BLR keeps track of all livestock farms in acres, head of cattle registry (day to day updates) and all livestock farmers data, thus acting as an essential tool for the traceability of the cattle industry in Belize. This information is important when producing the GHG inventory for this sector as this is the primary data source used for calculating livestock GHG emissions. OIRSA (International Regional Organization for Plant and Animal Health) hosts the system on their servers. Its mode of operations was determined through an MOU signed between OIRSA, MAFSE, BLPA and BAHA. While the system tracks the size and location of farms, it lacks a polygon mapping feature to show the shape and use of the farms; currently only points are used to show its location on a map. The registry collects information at a farmer level (info on each person) and estimated farms with their address. Through consultation, BLPA expressed that the system is not very user-friendly, and since it is controlled by OIRSA, they do not have the ability to add or remove certain components. The information within the BLR is updated with the use of livestock identification forms, movement permits, and livestock reduction forms. It can provide current and historical data through its special reports tool to autogenerate and through analysing and knowledgeable expertise to extract reliable information.

Through a stakeholder consultation with the agriculture sector, specifically the Ministry of Agriculture, several data providers were identified. The ones mentioned reiterated those that were determined under phase 1 of the project with the addition of a couple others: BLPA, the Poultry Association, SIRDI, BSI, Santander, CGA, BAHA and the Rice Association. It should be noted that these are also data providers that will assist in generating the GHG inventory report for the agriculture sector. The source of the data is through two main platforms, namely, the BAIMS and BLPA's BLR.

Transport sector

Under the transport sector, there is a Belize Motor Vehicle Registration and License System (BMVRALS) which is managed by the Department of Transport. The system implements several services that fall under the department which include those related to driver licenses, vehicle licenses, vehicle registration, learner permits, traffic tickets, and reports. BMVRALS centralises all transport related data previously managed by municipalities, where traffic data previously worked independent of each other and operated in isolated electronic and manual systems. Now an integrated and centralized transport system exists for the country, which is deemed as a great improvement in terms of transparency for the transport sector. Although, while the system collects data needed for the department's services, it does not capture information relating to any of the GHG and non-GHG indicators developed under phase 1. Though some of the data may be used in the calculation of GHG emissions or assessments such as fuel type, number of vehicles, etc., that is collected for vehicle registration.

In the GHG inventory setting, the transport sector is a sub-IPCC sector of the energy sector and therefore data and information for the GHG inventory, related to transport emissions has normally been recorded within Energy Sector reports. Thus, the appropriate institutions that were identified under phase 1 to monitor transport related indicators were both the Energy Unit and the Traffic/Transport Department. The transport sector level MRV system will be developed with the Department of Transport as the sector lead, as the primary focus will be transport-related data collection processes and management. This MRV system for the transport sector will incorporate existing mechanisms, such as the BMVRALS, and enhancing other aspects such as institutional arrangements and data collection processes.

The Department of Transport (DoT) is responsible for the registration, licensing, and control of all vehicles in Belize. It has a mission that will enable the most cohesive and efficient ground transportation system that increases safety and quality of life for all. Through consultation with the DoT, it has been recognised that the department falls short in several capacities including equipment and resource capacities, and as well as the technical understanding of data requirements which in turn results in inefficient data collection and management capacities. The DoT has indicated that they are interested in working from the bottom-up, i.e., building internal capacity to ensure they are equipped and capable to carry out external activities.

As mentioned, sector leads are responsible for collecting and reporting data for estimating and reporting GHG

emissions and reporting on non-GHG impacts and as well as tracking NDC actions and, therefore, the DoT would have the authority to request data from supporting institutions and/or data providers within the transport sector. These data providers can be seen in *Table 4* below.

The online platform mentioned above encapsulates all sectors under the overall national MRV system for climate change. Therefore, the DoT would also have access to the online platform, as sector lead, allowing them to upload data and information relating to climate change actions in Belize thus creating a data centralization storage system.

Climate action cases with corresponding indicators

The tables below present climate actions that exist within the agriculture and transport sectors. The indicators that these actions contribute to are also indicated within the table. These indicators are for Belize's Nationally Determined Contribution (NDC).

Agriculture sector

Table 1: Climate actions within the agriculture sector

Actions	Objective	Status	Focus	Indicator
Climate Resilient Sustainable Agriculture Project	To increase agriculture productivity and the adoption of climate-smart agricultural approaches among project beneficiaries, and to effectively respond to an eligible crisis or emergency	Ongoing	Adaptation	Capacity of relevant government and academic institutions in CSA strengthened by 2025 (2023 – 2025) Capacity of participating financial institutions: DFC, Commercial banks, credit unions, the Credit Union League, Farmers and Farmers' Organizations strengthened by 2025 (2023 – 2025) Concept note for financing facility developed by 2022 Financing facility formally established by 2023
Climate Risk Adaptation and Insurance in the Caribbean	To address climate change, adaptation and vulnerability by promoting weather-index based insurance as a risk management instrument in the Caribbean	Ongoing	Adaptation	Study of crop and commodity insurance schemes complete by 2023 Pilot of agriculture insurance schemes delivered by 2024
Resilient Rural Belize (BE-Resilient)	To provide financial and technical support for activities that would strengthen and promote appropriate agricultural practices and services for these farmers	Ongoing	Cross-cutting	Ha of agricultural lands using solar-powered irrigation systems by 2025 Climate resilient value chains developed by 2023 Climate resilient rural infrastructural assets developed by 2023

Transport sector

Table 2: Climate actions within the transport sector

Actions	Objective	Status	Focus	Indicator
Towards Low Carbon Transport: Piloting e-mobility within Belize's Public Transport System	To establish a policy framework to promote low carbon means of transportation and lay the foundation for further investments in the e-mobility sector, and to support the introduction of electric buses in Belize, ensuring technical, financial and regulatory settings for their operation in the public transport sector are in place	Ongoing	Mitigation	Number of electric buses deployed by 2025

Institutional arrangements for the sector level MRV systems

The sector level MRV systems are developed for two sectors - the agriculture sector and the transport sector. It is important to note that these sector level systems are not independent of the national MRV system. Instead, it builds upon what was established and is designed to work with and be incorporated within the national system. As such, some arrangements that were developed remain the same with the sector level systems feeding into the national system.

The national MRV system is broken down into two sections to provide a comprehensive interpretation of its reporting structure. Section one describes the reporting flow of GHG emissions data, and section two describes the non-GHG related reporting flow. Therefore, the sector-level MRV systems will fall into either one or both sections of the national system.

Some of the features that remain unchanged includes the overall coordination responsibility being led by the National Climate Change Office (NCCO). The NCCO is the lead entity responsible for climate change management in the country. The agriculture and transport (subsector of energy) sectors are GHG emission reporting sectors and follow the IPCC 2006 guidelines. Therefore, these sectors fall into the section of the national system that describes the reporting flow of GHG emissions data.

The approach remains the same which involves sector leads who are lead institutions that are responsible for tracking and providing information related to their respective sectors. The NCCO will continue to act as the overall coordinator for the implementation of climate change mitigation and adaptation activities and overseeing the tracking of the NDC. NCCO will also continue to provide operational, management and technical support for the reporting of the GHG inventory reports to sector leads as the national system monitors GHG emissions and removals. Supplementary responsibilities for NCCO includes functioning as the compiler for collected information and ensuring timelines are adhered to, notwithstanding the provision of templates and document management.

Agriculture sector

Under the domain of the NCCO, as the lead coordinator, stems the sectoral working group, which is comprised of lead entities from each sector, i.e., sector leads. As mentioned, the sector lead for the agriculture sector is the MAFSE.

With the agriculture sector falling under section one, data and information for GHG emissions and removals are to be collected by sector leads with the support of data providers. Data providers are significant information intermediaries that build and maintain reliable and quality data. *Table 3* below shows the actors and their responsibilities for the agriculture sector. A list of the indicators for the agriculture sector can be seen in *Table 5*, while the indicators and the institutions that should monitor them can be seen in

Annex 1. Note that the information in annex 1 were developed and consulted under ICAT phase 1.

Table 3: Roles and responsibilities for the agriculture sector

Role	Institution	Responsibility
Coordinating Entity	National Climate Change Office	The overall coordinating entity for the national MRV system is the National Climate Change Office (NCCO) serving as the operational branch of the Belize National Climate Change Committee (BNCCC), mobilizing climate change related actions for the country. The Office is responsible for the coordination with sector leads to collectively monitor the targets set out in the national climate change planning documents, not limited to the NDC as per the MPGS and Belize's NCCPSAP. In addition, overseeing the tracking of GHG and non-GHG impacts/indicators. And ensuring institutions report undergoes an internal verification process. NCCO will also draft and submit the final report to UNFCCC.
Sector Lead	Ministry of Agriculture	The sector lead will be responsible for tracking NDC actions, coordinate and collate with data providers, analysis of emission factors and drafting GHG summary reports.
Data Providers	BLPA	Provide data and information on GHG and mitigation actions and indicators, and on non-GHG and adaptation actions and indicators. Ensure that data undergoes internal verification process and to supply data to the sector lead within a reasonable timeframe.
	SIRDI	
	BSI	
	Poultry Association	
	BAHA	
	Santander	
	CGA	
	Rice Association	

The MAFSE, as a sector lead, will be responsible for collecting and reporting data on GHG emissions and non-GHG impacts with the assistance of its data providers. Among those listed in table XX, sector leads will also be responsible to:

- Collect, collate, process and update all GHG-related data in the agriculture sector
- Submit all process and supplemental data to the NCCO
- Draft sector summary reports
- Participate in peer reviews
- Conduct QA/QC procedures

Figure 1 below presents the institutional arrangements for the agriculture sector.

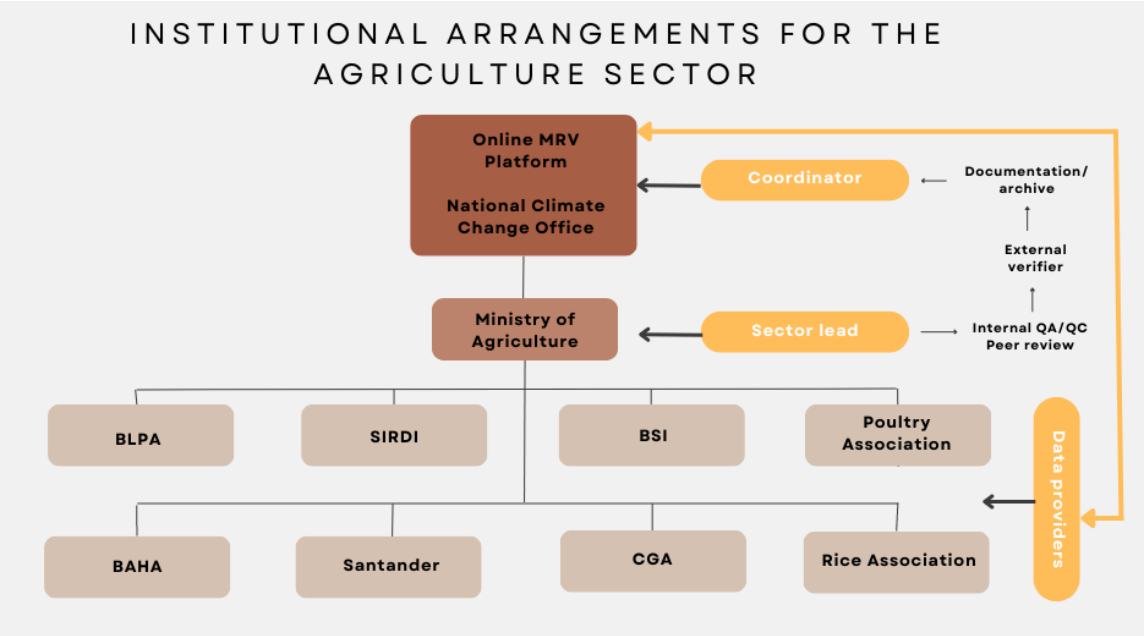

Figure 1: Diagram showing the institutional arrangements for the agriculture sector

Transport sector

Under the domain of the NCCO, as the lead coordinator, stems the sectoral working group, which is comprised of lead entities from each sector, i.e., sector leads. As mentioned, the sector lead for the transport sector-level MRV being developed is the Department of Transport.

The transport sector falls under section one of the national MRV system i.e., GHG/mitigation-related reporting. As such, data and information for GHG emissions and removals are to be collected by sector leads with the support of data providers. Data providers are significant information intermediaries that build and maintain reliable and quality data. *Table 4* below shows the actors and their responsibilities for the transport sector. A list of the indicators for the agriculture sector can be seen in *Table 5*, while the indicators and the institutions that should monitor them can be seen in

Annex 1. Note that the information in annex 1 were developed and consulted under ICAT phase 1.

Table 4: Roles and responsibilities for the transport sector

Role	Institution	Responsibility
Coordinating Entity	National Climate Change Office	The overall coordinating entity for the national MRV system is the National Climate Change Office (NCCO) serving as the operational branch of the Belize National Climate Change Committee (BNCCC), mobilizing climate change related actions for the country. The Office is responsible for the coordination with sector leads to collectively monitor the targets set out in the national climate change planning documents, not limited to the NDC as per the MPGS and Belize's NCCPSAP. In addition, overseeing the tracking of GHG and non-GHG impacts/indicators. And ensuring institutions report undergoes an internal verification process. NCCO will also draft and submit the final report to UNFCCC.
Sector Lead	Transport Department	The sector lead will be responsible for tracking NDC actions, coordinate and collate with data providers, analysis of emission factors and drafting GHG summary reports.
Data Providers	Municipal traffic departments Belize Electricity Limited Energy Unit	Provide data and information on GHG and mitigation actions and indicators, and on non-GHG and adaptation actions and indicators. Ensure that data undergoes internal verification process and to supply data to the sector lead within a reasonable timeframe.

The Department of Transport, as a sector lead, will be responsible for collecting data related to the transport sector only. The Belize Electricity Limited would be a data provider to the Department of Transport as they are collaborating on projects related to deployment of electric vehicles and buses and as such would have data and information for the department to utilize. The Energy Unit will remain as the institution responsible for the reporting of data on GHG emissions which falls under the overall energy sector. The Energy Unit therefore does the calculations and produces the sector summary report for the energy sector which considers transport. The Department of Transport will, however, assist in reviewing and verification processes of these reports as it relates to transport data. They will also assist in the reporting of non-GHG impacts with the assistance of its data providers. Among those listed in *Table 4*, sector leads will also be responsible to:

- Collect, collate, process and update all GHG-related data in the transport sector while working with the Energy Unit
- Submit all process and supplemental data to the NCCO
- Peer review and verification of transport data within the sector summery reports
- Conduct QA/QC procedures

Figure 2 below presents the institutional arrangements for the transport sector.

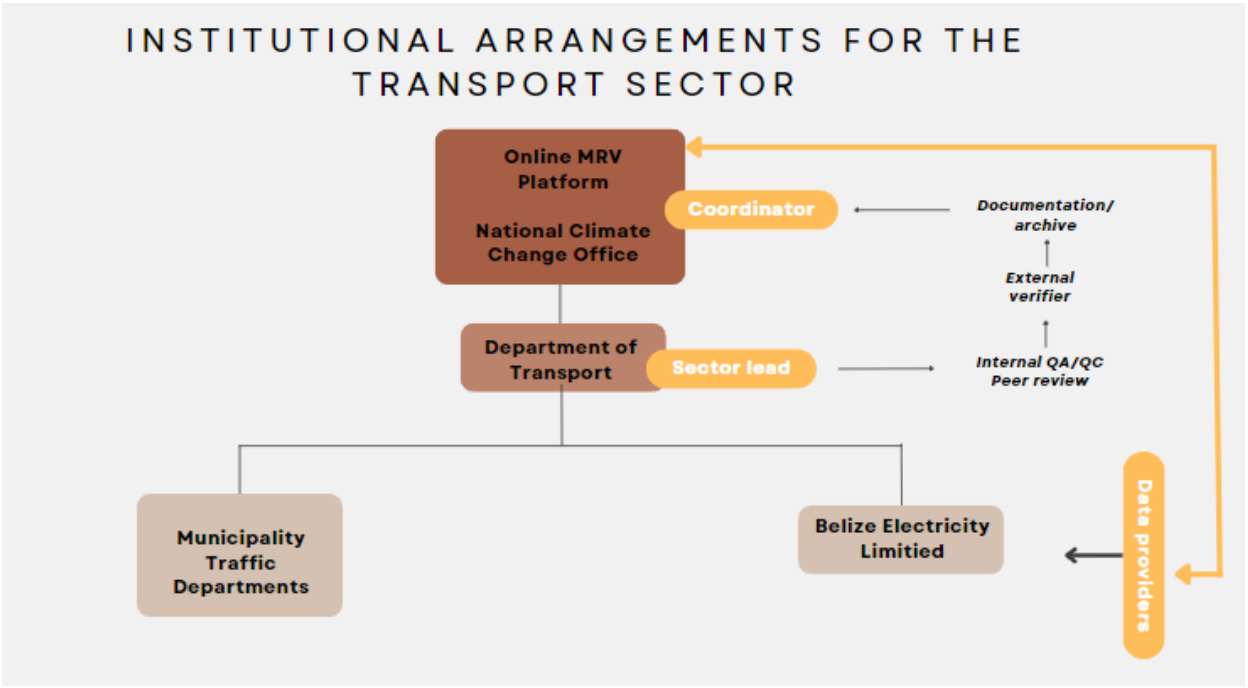

Figure 2: Diagram showing the institutional arrangements for the transport sector

Reporting protocols for data and information reporting and sharing

Sector leads are responsible for collecting and reporting data on GHG emissions and non-GHG impacts and have the authority to request data from supporting institutions, i.e., data providers. Essentially, all sector leads are responsible to collect, collate, process and update data for their respective sectors, as well as submitting all processes and supplemental data the NCCO. The data and methodologies used will be subject to peer reviews by each sector lead and/or an independent expert. After comments are addressed and the data verified consistently with QA/QC protocols, the NCCO is responsible to prepare final obligated reports to the UNFCCC. These final reports are then reviewed by the Belize National Climate Change Committee (BNCCC) before taken to cabinet for final approval for submission to the UNFCCC.

Sector reports will be formulated by the sector leads. The reports will be assessed internally to maintain quality control and quality assurance of data. Furthermore, reports will be examined by an external verifier, an accredited third-party verification entity that conducts an objective assessment on the accuracy of the report and the data sources that have been used to collect and collate data. Once thoroughly assessed, it will be documented, archived, and stored on the online MRV platform.

Under phase 1 of the ICAT project, reporting templates were established. Since the sector level MRV systems are building on what is already in place for the national MRV system, the existing reporting templates will be utilized for the sector level systems. It should be noted that these templates have been incorporated on the online platform for the MRV system and therefore information should be uploaded there. Table 5 below provides a reference that can be used to facilitate the data collection and reporting processes. As was already established, reporting frequency should be done on an annual basis.

The ICAT-Belize phase 2 project is simultaneously ongoing with the ICAT Climate Finance MRV project which is enhancing capacities to monitor and report on climate finance flows. Therefore, the sector-level MRV systems for the two sectors under phase 2 will focus on support for tracking of GHG emissions and the impact of adaptation and mitigation actions while climate finance tracking will be done separately under the CF MRV project. The Climate Finance MRV project will develop a methodology on how to track climate finance including data collection and entering formats that will be used to populate data. It will ensure that data covers various options including appropriate tagging, use of Rio Markers, and grant equivalent amounts. The project will ensure institutional arrangements are developed and that capacity building is developed among stakeholders on the system of climate finance tracking.

Therefore, to facilitate the data collection and reporting described thus far for GHG emissions and impacts of climate actions, the template in *Table 5* below can be used. Note that this is expected to be used to guide the process and can be a point of reference or referral when needed. For this reason, it shows what information is needed and the different aspects that should be included during the collection and management of data. However, it is important to note that this information is not expected to be reported in the template below but rather on the online MRV platform developed thus far. Each sector lead and/or actor within the MRV system will be granted access (via a user profile) and will be required to upload the necessary information on the platform.

Table 5: Template for reference to facilitate data collection and reporting processes

Scope and purpose	To track, assess and report data on GHG emissions and impacts of climate actions
Data collection and reporting guidelines	See figures 1 and 2 for institutional arrangements developed for the agriculture and transport sector, respectively, portraying the flow of information. Each sector lead will have access to the online platform and be required to upload data and information there for their respective sectors.
List of relevant GHG	*Agriculture sector:*

indicators (inventory), GHG and non-GHG indicators for tracking NDC actions ***Note: These indicators were developed under ICAT-Phase 1***	i. Tons of emission reduced by the number of farms adapted altering crop cultivation methods ii. Tons of emission reduced from the number of farmers implementing effective livestock management iii. Number of farmers with access to an early warning system for drought and extreme weather events iv. Number of farmers that adapted improved soil and water management practices v. Proportion of men and women with new business opportunities and new established business vi. Number of new investments in BZD vii. Hectares of land converted to agroforestry/climate farming practices viii. Ratio of women employed/ trained ix. Proportion of agriculture area under productive and sustainable agriculture x. Number of youth and adults who have received scientific, technological or other skills training xi. Number of farmers that adopted improved crop and livestock husbandry practices xii. Number of climate change projects to support resource dependent communities xiii. Percentage of the relevant population informed on the hazards and best practices from the Belize Agriculture Information System xiv. Ratio of women employed/trained *Transport sector:* i. Number of imported vehicles that receive emission-based taxes/feebates ii. Number of hybrid and electric buses deployed iii. Amount of foreign currency saved on power purchase and imported fuels iv. Decrease in frequency and time spent in congestion v. Number of communities and population with access to new climate-resilient infrastructure or services vi. Number of new projects to support climate-resilient infrastructure vii. Number of new positions established viii. Number of imported vehicles that receive emission-based taxes/feebates ix. Number of hybrid and electric buses deployed x. Amount of foreign currency saved on power purchase and imported fuels xi. Decrease in frequency and time spent in congestion xii. Number of communities and population with access to new climate-resilient infrastructure or services xiii. Number of new projects to support climate-resilient infrastructure xiv. Number of new positions established
Data quality assurance procedures	A general QC checklist will be provided (see in annex). The checklist comprises of a series of questions that should be answered to determine if correct procedures were followed. It also includes a column to indicate what corrective measures were taken along with who did the task and when it was completed.
Frequency and timeliness	Data collected on a quarterly basis and reported on an annual basis
Section encouraging the provision of information on sectoral policies	Each Party shall provide information on actions, policies and measures that support the implementation and achievement of its NDC under Article 4 of the Paris Agreement, focusing on those that have the most significant impact on GHG emissions or removals and those impacting key categories in the national GHG inventory.

Section encouraging the provision of methodologies for how indicators are collected, and impacts are estimated	Each Party shall provide a description of each methodology and/or accounting approach used, as applicable for: a) Targets b) Construction of baselines c) Each indicator identified The information referred to above shall include, as applicable and available to the Party's NDC under Article 4: a) Key parameters, assumptions, definitions, data sources and models used b) IPCC guidelines used c) Metrics used d) Where applicable to its NDC, any sector-, category- or activity-specific assumptions, methodologies and approaches consistent with IPCC guidance, taking into account any relevant decision under the Convention

Annex 1

Table 6 GHG and non-GHG impacts monitored under the agriculture sector

MRV System		Indicators	NDC Targets
Formal system Belize Agriculture Information Management System (BAIMS)	GHG	Tons of emission reduced by the number of farms adapted altering crop cultivation methods	10% methane emission reduction from livestock by 2030
		Tons of emission reduced from the number of farmers implementing effective livestock management	
		Number of farmers with access to an early warning system for drought and extreme weather events	Develop and implement an enhanced early warning system for drought and extreme weather events to support farmers in planning for and responding to the impacts of climate change 2025
		Number of farmers that adapted improved soil and water management practices	Reverse post-harvest losses through the implementation of the National Adaptation Strategy to Address Climate Change in the Agricultural Sector to increase the adaptive capacity of the agricultural sector
		Indicator	**Impacts**
	Non-GHG	Proportion of men and women with new business opportunities and new established business	New businesses opportunities
		Number of new investments in BZD	
		Hectares of land converted to agroforestry/climate farming practices	Biodiversity of terrestrial ecosystems
		Ratio of women employed/ trained	Climate change awareness
		Proportion of agriculture area under productive and sustainable agriculture	Food Security
		Number of youth and adults who have received scientific, technological or other skills training	Capacity, skills and knowledge development
		Number of farmers that adopted improved crop and livestock husbandry practices	Agricultural productivity and sustainability

Table 7 Agriculture sector NDC targets and indicators with institutions

Sector		NDC Targets	Indicators	Institution	Reporting Frequency	
					Target	Indicator
Agriculture	**GHG**	10% methane emission reduction from livestock by 2030	Tons of emission reduced by the number of farms adapted altering crop cultivation methods	Ministry of Agriculture/Sugar Industry Research and Development Institute (SIRDI)/Department of the Environment (DOE)/ Belize Livestock Production Association (BLPA)	Biennial	Annually
			Tons of emission reduced from the number of farmers implementing effective livestock management			Annually
		Reverse post-harvest losses through the implementation of the National Adaptation Strategy to Address Climate Change in the Agricultural Sector to increase the adaptive capacity of the agricultural sector	Number of farmers that adopted improve soil and water management practices	Ministry of Agriculture/Sugar Industry Research and Development Institute (SIRDI)/Department of the Environment (DOE)/	Biennial	Annually

		Develop and implement an enhanced early warning system for drought and extreme weather events to support farmers in planning for and responding to the impacts of climate change by 2025	Number of climate change projects to support resource dependent communities	Ministry of Agriculture/CARDI /SIRDI/BAHA	Biennial	Annually
		Prioritized Impacts to be Monitored	**Indicators**	**Institution to Monitor Missing Impacts**	**Impacts**	**Indicators**
	Non-GHG	New business opportunities	Proportion of men and women with new business opportunities and new established business	Ministry of Agriculture	Biennial	Annually
			Number of new investments in BZD			Annually
		Climate change awareness	Percentage of the relevant population informed on the hazards and best practices from the Belize Agriculture Information System	Ministry of Agriculture/Department of the Environment (DOE)	Biennial	Annually
			Ratio of women employed/ trained			Annually

		Capacity, skills and knowledge development	Number of youth and adults who have received scientific, technological or other skills training	Ministry of Agriculture	Biennial	Annually
		Agricultural productivity and sustainability	Number of farmers that adopted improved crop and livestock husbandry practices	Ministry of Agriculture/SIRDI/ CARDI/BAHA	Biennial	Annually

Table 8 GHG and non-GHG impacts monitored under the transport sector

MRV System		Indicators	NDC Target
Formal system National database for vehicle registered	GHG	Number of imported vehicles that receive emission-based taxes/feebates	Emission avoided of 17KO2e/year through 15% reduction in conventional transportation fuel use and efficiency per passenger
		Number of hybrid and electric buses deployed	
		Amount of foreign currency saved on power purchase and imported fuels	
		Indicators	**Impact**
	Non-GHG	Decrease in frequency and time spent in congestion	Traffic congestion
		Number of communities and population with access to new climate-resilient infrastructure or services	City and Community resilience
		Number of new projects to support climate-resilient infrastructure	
		Number of new positions established	New Jobs

Table 9 Transport sector NDC targets and indicators with institutions

Sector		NDC Target	Indicators	Institution Monitor	Reporting Frequency	
					Target	Indicator
Transport		Emission avoided of 17KO2e/year through 15% reduction in conventional transportation fuel use and efficiency per passenger	Number of imported vehicles that receive emission-based taxes/feebates	Traffic Dept./Energy Unit	Biennial	Annually
			Number of hybrid and electric buses deployed		Biennial	Annually
			Amount of foreign currency saved on power purchase and imported fuels		Biennial	Annually
		Prioritized Impacts to be monitored	**Indicator**	**Institution to Monitor**	**Impact**	**Indicator**
	Non-GHG	Traffic Congestion	Decrease in frequency and time spent in congestion	Traffic Dept.	Biennial	Annually
					Biennial	Annually
		City and community resilience	Number of communities and population with access to new climate-resilient infrastructure or services	Traffic Dept.	Biennial	Annually
			Number of new projects to support climate-resilient infrastructure		Biennial	Annually
		New jobs	Number of new positions established		Biennial	Annually

Annex 2

General QC Checklist for GHG Inventory data review

QC Activity	Task Completed		Corrective Measure Taken	
	Name/ Initials	Date	Supporting Documents (List Document Name if applicable)	Date
Are all categories and gases for which methods are provided in the 2006 IPCC Guidelines reported? If not, are notation keys (e.g. "NE" (not estimated) or "NO" (not occurring)) reported?				
Are emissions or notation keys reported for all years back to 1994 which were reported in previous NC/BUR submissions?				
Check to ensure the time series consistency of trends. All trends are described in the GHG inventory.				
Check for transcription errors in emission/removal calculations				
Check for transcription errors in inputting AD, EFs and other information in any reporting software				
Are spreadsheet features (e.g. cross references as opposed to "hardwiring" EFs, conversion factors, etc) used in calculation sheets to the extent possible to avoid errors in calculations.				
Are bibliographic references included for all sources of AD, EFs and assumptions				
Reproduce a sample of emissions/removals calculations to ensure accuracy				
Check that the correct units (e.g. kg, kt, TJ, Gg, etc) are entered into data entry sheets and any software correctly, and appropriate unit conversions are applied (where necessary).				
Data reported in figures and tables in the GHG inventory report, match the calculations in the spreadsheets and any software used to calculate GHG emissions/removals.				
Identify parameters (e.g., activity data, constants) that are common to multiple categories and confirm that there is consistency in the values used for these parameters in the emissions/removal's calculations.				
Confirm that confidential data are handled and reported in a manner consistent with agreed upon arrangements with data providers				
All spreadsheets, AD, EFs, assumptions and information to support methodological choice are sent for archiving				
Other (please specify)				

Reference: Deliverable 5, Report on formalized reporting protocols between institutions, reporting templates, and an appointment for MRV platform, ICAT Phase 1

General QC Checklist for Mitigation data review

QC Activity	Task Completed				
	Name/ Initials	Date	Yes	Partially	No
Does the data collection and reporting include elements identified in Decision-/CMA 3 Guidance operationalizing the modalities, procedures and guidelines?					
Has quality assurance and quality control of data, methodologies and other relevant information been conducted?					
Does the data collection and reporting contribute to GHG and non-GHG targets					
Does data collection and reporting better contribute to the mitigation targets, compared to previous baseline data?					
Does the data collection and reporting strengthen or add sectoral non-GHG target(s)					
Does the data collection and reporting of NDC actions and indicators covers all sectors or sector (as define by the MPGs)?					
Does the data collection and reporting of NDC actions cover all gases (as defined by the MPGs)					

Reference: Deliverable 5, Report on formalized reporting protocols between institutions, reporting templates, and an appointment for MRV platform, ICAT Phase 1

General QC Checklist for Adaptation data review

QC Activity	Task Completed				
	Name/ Initials	Date	Yes	Partially	No
Does the data collection and reporting of NDC actions include information on adaption actions and/or economic diversification plans (para. 73 of the MPGs)?					
Does the data collection and reporting of the NDC actions has clear adaptation objectives consistent with the Paris Agreement adaptation objectives?					
Has quality assurance and quality control of data, methodologies, and other relevant information been carried out?					
Does the data collection and reporting consistent with the countries national and sectoral development priorities					
Does the data and reporting of NDC actions includes SDGs contribution?					

Reference: Deliverable 5, Report on formalized reporting protocols between institutions, reporting templates, and an appointment for MRV platform, ICAT Phase 1

References

Alvarez, J. P. (2021). Report on Gaps in Data and Information, and Appropriate Institutions to Monitor Identified Progress and Impact Indicators. National Climate Change Office.

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