Report Describing Existing MRV Mechanisms in Relevant Institutions:

Inclusive of Gaps in Data and Information, and Appropriate Institutions to Monitor Identified Missing Impact and Progress Indicators

Initiative for Climate Action Transparency - ICAT -

Report on gaps in data and Information, and Appropriate Institutions to Monitor identified Missing Impact and Progress Indicators

Deliverable #4

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List of Abbreviations

BAIMS	Belize Agriculture Information Management System
BERDS	Biodiversity and Environmental Resource Data System of Belize
BNSDI	Belize National Spatial Data Infrastructure
BNSS	Belize National Statistical System
ETF	Enhanced Transparency Framework
FREL	Forest Reference Emission Level
GHG	Greenhouse Gas
GHGI	Greenhouse Gas Inventory
ICAT	Initiative for Climate Action Transparency
IPCC	Intergovernmental Panel on Climate Change
MPG	Modalities Procedures Guidelines
MRV	Monitoring Reporting Verification
PA	Paris Agreement
SDG	Sustainable Development Goals

Introduction

In keeping within the scope of the Enhanced Transparency Framework (ETF) established under the Paris Agreement (PA), the Modalities, Procedures, and Guidelines (MPGs) for the Agreement's Article 13, have been adopted amongst others to provide information on how to report national GHG inventories, on the progress of implementation and achievement of Nationally Determined Contributions (NDC), reporting information relating to climate change impacts and adaption, and on support needed and received. As Belize's national response for climate change improves towards the implementation of the NDC, monitoring systems also need to be enhanced to assess impacts, and understanding the status of climate change goals and their progression, while keeping in compliance with the requirements laid out in the MPGs. Through the Initiative for Climate Action Transparency (ICAT), Belize is receiving support in enhancing its national Monitoring, Reporting, and Verification (MRV) system to track the implementation and progress of the NDC.

In enhancing the national MRV System without replicating efforts and putting undue burden on the institutions, the use of existing MRV practices is essential and should be incorporated into the enhanced national MRV System to improve transparency and to ensure alignment to other existing or planned MRV efforts. Furthermore, it is important to highlight the different experiences and potential challenges to minimize inaccuracies and improve the efficiency of the overall national system. In Belize, formal MRV arrangements are quite limited between institutions in general, including between government agencies and the National Climate Change Office (NCCO). However, several informal MRV practices exist throughout the different sectors which will be further examined in this report.

A national perspective was taken into consideration to differentiate "formal" and "informal" systems, considering the rationale behind the type of information collected, and whether that information is used at the national and/or local level. For informal systems that exist in Belize, there are more so concentrated within individual institutions rather than a sector-wide system. Consequently, that information is usually collected and validated and is solely used for institutional purposes and not usually shared, partially due to a lack of established formal data-sharing agreements. These systems usually encompass an unwritten rule where MRV practices are understood, but no tangible agreements and procedures are established. On the contrary, formal MRV systems are sector-wide systems that collect data for the country where the information collected can be shared internally and between institutions, and where procedures are generally well defined.

Overall, both formal and informal systems are used in Belize, and it is imperative to build on these existing structures and processes to better track impacts related to the NDC. The implementation of a full-scale national MRV system for climate change requires stakeholder involvement. In wake of the current Covid-19 pandemic, the stakeholder engagement process was initiated through online platforms such as Microsoft Teams and Google Forms. Consultations were held to obtain feedback on the design and implementation of an integrated system for Belize. The objective was to initiate stakeholder responses on different MRV

mechanisms, inclusive of the types of data collected, frequency, reporting, and validation processes to enable synergies on existing and developing MRV systems, also considering cross cutting non-GHG impacts. To examine this information, a review of sectors' current MRV practices was required to identify what is and what is not monitored. The outcome of the consultations provided information on existing formal MRV systems, in particular: The Forest Department (tracks GHG), Agriculture (socio-economic development data for farmers and policymakers), Energy sector's (tracks GHG emission reduction), whose MRV system is under development and Transport (data on registered vehicles). The other sectors/institutions are prescribed to informal systems where data is collected and monitored at the institutional level in particular Waste, Tourism and Water.

In this frame of reference, this report is intended to firstly identify current MRV practices within the relevant institutions see (Annex 1 to Annex 8), secondly to identify impacts and progress indicators that are already being monitored, taking into consideration frequency and quality. Thirdly, to identify gaps between what is currently monitored and what is required to be monitored at the international level. Lastly, to identify the institutions that would be most appropriate or that have a mandate to monitor identified missing impact and progress indicators. Largely, Belize's National MRV System, as much as possible, must be built on existing structures and processes that are attainable and feasible to be implemented and operational.

Mapping of existing MRV mechanisms in the relevant institutions and relevant climate change data and information currently generated

The tables *(1-9)* below represent each sector's MRV mechanisms and GHG and non-GHG impacts being monitored by the existing formal and informal systems. Formal and informal MRV systems that are found in Belize, to a small extent, either capture GHG or non-GHG information (information is limited in this area on existing tracking systems) but do not currently capture both impacts comprehensively. In addition to the tables presented below, certain sectors will not register both impacts as they are specifically focused on adaptation, hence, sectors such as Water, Health and Tourism will not represent any GHG impacts.

Table 1 GHG and non-GHG Impacts Monitored under the Forestry Sector

MRV System		Indicators	NDC Target	Already Monitored	Comments
National Forest Monitoring System	GHG	Hectares of forested and reforested area inside and outside protected areas	Reduce GHG emissions and increase GHG removals related to land use change totalling 2,053 KtCO2e cumulative over the period from 2021 to 2030	Yes	The current MRV system does not capture the area reforested. Some non-GHG impacts are collected at institutional level and not by the MRV system
		Number of hectares of riparian forests restored in degraded and deforested lands		No	
		Biosafety policy developed and implemented by 2023	Implement protection targets of the National Biodiversity Strategy Action Plan including increased effectiveness of the National Protected Areas System by 2024	No	
		Indicators	**Impacts**	**Already Monitored**	
	Non-GHG	Number of forest-dependent communities that received support from direct and indirect threats to climate change	Protection of poor and negatively affected communities	No	

		Number of Climate Change projects to support resource dependent communities		No	
		Hectares of land protected	Biodiversity of terrestrial ecosystems	Yes	
		Annual maximum sustained yield maintained for timber and NTFP stocks		Yes	
		Hectares of agricultural land applying climate friendly practices		Partially	
		Number of threatened species maintained in protected areas		Partially	
		Number of youth and adults who have received scientific, technological or other skills training in sustainable forest management	Capacity, skills and knowledge development	No	
		Annual change rate in deforestation (% and ha)	Land-use change including deforestation, forest degradation and desertification	Yes	
		Annual change in degraded or decertified arable land (% or hectares)		Yes	

Table 2 GHG and non-GHG impacts monitored by existing MRV system under the Waste Sector

MRV System		Indicators	NDC Target	Already Monitored	Comments/ Recommendations
Informal system	GHG	Number of households and commercial premises with municipal services to end open burning of waste by 2025	Improve waste management processes to avoid emissions of 18 KtCO2e, in line with the national waste management strategy	No	
		Number of closed municipal dumps yearly		No	
		Indicators	**Impacts**	**Already Monitored**	
	Non-GHG	Number of rural communities with waste management system and collection and drop off services implemented annually	Waste generation and disposal	Partially	
		Tons of waste recycled		Yes	
		Tons of PET recovered at transfer stations		Yes	
		Tons of glass recovered at transfer stations		Yes	
		Number of new businesses established from climate change projects from the waste sector	New business opportunities	No	
		Proportion of men and women with new business opportunities and new established businesses		No	
		Proportion of new men and women heired and promoted		No	
		Number of new investments in waste management (BZD)		No	
		Number of new positions established in the waste sector	New Jobs	No	

Table 3 Non-GHG Impacts Monitored under the Tourism Sector

MRV System		Non-GHG			Comments
		Indicator	**NDC Target**	**Already Monitored**	
Informal system	Non-GHG	Number of communities with access to new climate resilient infrastructure or service	Increase the adaptive capacity of tourism sector through the development of climate resilient planning frameworks and infrastructure	No	
		Indicator	**Impact**	**Already monitored**	
		Revenue gained from climate change project (USD/year)	Economic Development	Yes	
		Proportion of men and women with improved income opportunities from tourism climate initiatives		No	Difficult to track
		Number of women/men, girls/boys who have received climate change awareness training	Climate Change awareness	Yes	
		Ratio of women employed and trained	Gender equality	Yes	
		Number of coastal planners and policy that received support in selecting appropriate policies and adaption strategies	Cost-Effectiveness of Policy	No	
		Number of youth/ adults, men/women who have received scientific, technological or other skills training supporting climate action	Capacity, skills and knowledge development	No	
		Hectares of coastal tourism areas that are vulnerable to climate change	City and Community resilience	yes	
		Number of communities and population with access to new climate resilient infrastructure or services		No	

		Number of local destinations with appropriate infrastructure installed for adaptation to climate change		No	
		Number of new projects to support climate-resilient infrastructure		No	
		Number of consulted and involved community and indigenous people (men and women) representatives in policymaking process	Public participation in policy making process	No	

Table 4 GHG and Non-GHG impacts Monitored under the Agriculture Sector

MRV System		GHG/Non-GHG			Comments
		Indicators	NDC Targets	Already Monitored	
Formal system Belize Agriculture Information Management System (BAIMS)	GHG	Tons of emissions reduced by the number of farms adapted altering crop cultivation methods	Reduce methane emissions from livestock by 10% by 2030 and avoid emissions of at least 4.5 ktCO2e related to agriculturally driven land use change by 2025	No	
		Tons of emissions reduced from the number of farmers implementing effective livestock management		No	
		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	No	
		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	No	

		Indicator	Impacts	Already Monitored	
	Non-GHG	Proportion of farmers (men and women) with new business opportunities and new established business	New businesses opportunities	No	
		Number of new investments in sustainable agricultural techniques and technologies (BZD)		No	
		Hectares of land converted to agroforestry/climate farming practices	Biodiversity of terrestrial ecosystems	Yes	
		Ratio of women employed/ trained in climate change	Climate change awareness		
		Number of women/men, girls/boys who have received climate change awareness training/seminars/workshops		No	
		Proportion of agriculture area under productive and sustainable agriculture	Food Security	Yes	
		Number of youth and adults who have received scientific, technological or other skills training relating to climate smart agriculture (CSA)	Capacity, skills and knowledge development	No	
		Number of farmers that adopted improved crop and livestock husbandry practices	Agricultural productivity and sustainability	No	

Table 5 GHG and Non-GHG impacts monitored under Coastal Zone and Fisheries

MRV System		GHG/Non-GHG			Comments
		Indicators	**NDC Targets**	**Already Monitored**	
Informal system (MRV in development) Coastal and Marine Data Center	GHG	Tons of emission avoided from the degree of implementation of national seagrass policy developed and enhance	Enhance the capacity of the country's mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 KtCO2e between 2021 and 2030 through mangrove restoration	No	
		Tons of emission reduced from the hectares of mangrove areas restored and protected		No	
		Number of identified priority species that could serve as indicators for ecosystem health	Increase resilience for coastal communities and habitats to climate impacts by managing further development of the coastline to reserve coastal habitat and land loss by 2025	No	
		Number of interventions conducted on those systems	Strengthen the resilience of coastal communities by developing an early warning system for storm surges by 2025	No	
			Build capacity in fisheries and aquaculture sector through research, diversification and retraining to support livelihoods while protecting coastal ecosystems	No	
		Indicator	**Impacts**	**Already Monitored**	
	Non-GHG	Number of monthly patrol efforts (implementation and enforcement capacity of 2020 fisheries act and 2018 mangrove regulation implemented and enforced	Fish stock sustainability	Yes	
		Number of new replenishment zone established			
		Species count at the spawning aggregation site yearly			
		Number of women/men, girls/boys who have received training	Climate Change awareness	No	

		Ratio of women employed / trained	Gender equality	No	
		Number of vulnerability assessment conducted in national coastal areas	Capacity-building and research	No	
		Number of new initiatives to encourage diversification in fish species	Biodiversity of freshwater and coastal ecosystems	Yes	
		Hectares of coastal wetlands/mangroves restored and protected		Yes	
		Number of coastal communities at risk from natural disasters	City and Community resilience	No	
		Number of coastal communities with access to new climate resilient infrastructure or services		No	
		Number of new projects to support climate resilient coastal infrastructure		No	
		Number of Climate Change projects to support resource dependent coastal communities	Protection of poor and negatively affected communities	No	

Table 6 GHG and non-GHG impacts Monitored under the Energy sector

MRV System		GHG/Non-GHG			Comments/ Recommendations
		Indicators	**NDC targets**	**Already Monitored**	
Formal system In developmental stage	GHG	Percent reduction of total distribution and transmission losses	Avoid emissions from the power sector equivalent to 19 KtCO2e per year through system and consumption efficiency measures amounting to at least 100 GWh/year by 2030	No	The MRV system in development plans to track all NDC GHG targets for the energy sector. Indicators are still under revision by IRENA and Energy unit
		Number of buildings incorporating appliance efficiency standards and building codes		Yes	
		Tons of emission reduced from high carbon electricity sources	Emission avoided up to 44KtCO2e in the national electricity supply by 2030 through expansion of renewable energy source	No	
		Number of MW diesel generation taken offline		No	
		Percent gross generation of electricity from renewable energy achieved		No	
		Indicators	**Impact**	**Already Monitored**	
		Amount of foreign currency saved on imported fuels	Economic Development	Yes	
	Non-GHG	Amount of savings in energy expenditure		Yes	

		Number of MW utility-scale solar power installed annually	Energy Independence Security or Sovereignty	Yes	
		Number of MW hydropower capacity installed annually		Yes	
		Electricity imported as percentage of primary energy supply		Yes	
		Proportion of population with access to electricity MWh of renewable energy generated	Access to clean, reliable and affordable energy SDG 7	No	
		Number of households / businesses with new access to clean, reliable and affordable energy		No	
		Percentage of renewables in electricity mix %.		Yes	
		Installed Power Generation Capacity (Non-RE thermal vs RE)		Yes	
		Number of feasibility research conducted on wind power generation and storage technologies to support renewable power sources by 2030		No	

Table 7 GHG and non-GHG impacts Monitored under the Transport sector

MRV System		GHG/Non-GHG			Comments/ Recommendations
		Indicators	**NDC Target**	**Already Monitored**	
Formal system National database for vehicle registered	GHG	Number of imported vehicles that receive emission-based taxes	Avoid 117 KtCO2e/year from the transport sector by 2030 through a 15% reduction in conventional transportation fuel use by 2030 and achieve 15% efficiency per passenger- and tonne-kilometre through appropriate policies and investments	No	
		Number of hybrid and electric buses deployed		No	
		Amount of foreign currency saved on imported fuels		No	
		Indicators	**Impact**	**Already Monitored**	
	Non-GHG	Decrease in frequency and time spent in congestion	Traffic congestion	No	
		Number of communities with access to new climate-resilient road infrastructure or services	City and Community resilience	No	
		Number of new projects to support climate-resilient traffic infrastructure		No	
		Number of new positions established in the transport sector	New Jobs	No	

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

MRV System		GHG/Non-GHG			Comments/ Recommendations
		Indicators	**NDC Target**	**Already Monitored**	
Formal system	Non-GHG	Number of watersheds with integrated water resource management programmes	Enhance the protection of water catchment (including groundwater resources) areas and make improvements to the management and maintenance of existing water supply systems through the implementation of the National Water Sector Adaptation Strategy and Action Plan	No	
		Number of improvements made on the management and maintenance of existing water supply systems through implementation of the National Water Sector Adaption Strategy and Action Plan		No	
		Indicator	**Impact**	**Already Monitored**	
		Number of communities and population with new access to safe, good quality and steady water supply	Access to adequate water supply	Yes	
		Number of persons that have the economic means to access to water supply		No	

Table 9 GHG and non-GHG impacts monitored under the Health sector

MRV System		Non-GHG		Already Monitored	Comments/ Recommendations
		Indicators	**NDC Target**		
Formal system	Non-GHG	Number of facilitation of investments in health infrastructure	Build adaptive capacity in the health sector by assessing vulnerability and investing in capacity to respond to climate-related threats	No	
		Indicator	**Impact**	**Already monitored**	
		Percent of population at risk of vector-borne diseases	Good health and wellbeing	No	
		Number of reported cases of infectious disease		Yes	

Identification of gaps Between what is Currently Monitored and what is Required to be Monitored at International and the National Level

The development of the national MRV system must be built on existing structures to ensure synergies between the national MRV system and current MRV practices to reduce overlaps of information and to identify where improvements can be made. This includes assessing which non-GHG and GHG impacts are being monitored. The outcome of the assessment showed that existing MRV systems does not capture a wide range of GHG and non-GHG data. To further present this finding, the above tables will be referenced accordingly by sector (Forestry, Waste, Tourism, Agriculture, Coastal Zone/Fisheries, Energy, Transport, Water, and Health). **Note:** There are larger platforms that capture data, such as the GHG inventory (GHGI) and the Belize National Statistical System (BNSS), which track a wide range of information that contributes to the different sectors. Most notably, the database for the national GHG inventory and Forest Reference Emission Level (FREL) tracks emission and removals by sinks of greenhouse gas for the country. It was established under the Paris Agreement (PA) through the Enhance Transparency Framework to facilitate the implementation of the NDC. Granted the importance of this system as a means of tracking GHG, the inventory will be referenced throughout this section of the report.

First of which, the Forest Sector's MRV system (National Forest Monitoring System), monitors GHG emissions and removals but information on non-GHG impacts is not captured under the current system. Notably, non-GHG data related to the sector is captured by other platforms such as BNSS that track some information related to SDG 15: Sustainably manage forest, combat desertification, reverse land degradation, halt biodiversity loss, linking to degradation and desertification in (*table 1)*. In principle, it is important to evaluate other tracking platforms to see what non-GHG impacts are being monitored. All non-GHG impacts presented in (*Table 1)* are important impacts to be monitored at the national and international level.

The findings from the waste sector revealed that an informal MRV system does exist which currently monitors aspects of the non-GHG impact “waste generation and disposal” (*see Table 2*) particularly tons of waste recycled, and tons of glass recovered at transfer stations to note. Emissions from the waste sector are recorded under the GHG inventory and are collected by the Belize Solid Waste Management Authority (SWaMA) who lead the efforts in data collection and management for the waste sector. And as part of the MPGs, it is important to include this information into the system, providing estimates of expected and achieved GHG emissions and reductions.

In the case of the tourism sector, as previously stated, only non-GHG impacts are recorded. This is not surprising as tourism is not classified as an IPCC sector, and emissions from tourism activities (e.g., waste, transport, energy use, etc.) are captured by other sectors. Although, given the importance of this sector to the Belizean economy, the need for adaptive measures and

increased resilience to climate change, and the potential for GHG emission reductions in the sector, it is relevant to start monitoring the climate-related contribution of interventions and policies in this sector. A formal system is not in place to track non-GHG impacts. Currently monitored are aspects of economic development and gender equality not relating to climate change. The informal MRV system captures performance data for the tourism industry. As part of the NDC tracking requirements, countries are provided with the option to share information on non-GHG-related impacts. The information prescribed in *(Table 3)* are impacts that the sector should strive to monitor.

In assessing the MRV structure for the agriculture sector, it has shown that a formal MRV system exists, the Belize Agriculture 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". However, the system does not collect data on GHG emissions, nevertheless, emission reduction for the agriculture sector is recorded under the GHGI. The list of non-GHG impacts seen in (*Table 4*) are considered important and should be prioritized for tracking.

In terms of the coastal zone/fisheries sector, the database used is an informal system (Coastal and Marine Data Centre) that houses spatial and tabular data. This data is obtained from different technical/research units and projects of the institution. It should be noted that this system does not currently collect information on GHG emissions reduction (see *Table 5).* However, other institutions under this sector collect such information. The University of Belize ERI is a prime example of such an institution that collects emission data for the sector along with the Fisheries department and co-protected areas manager support. About non-GHG impacts, a small portion is being monitored, “food security”, “fish stock sustainability”, and “biodiversity of freshwater and coastal ecosystems”. Inclusive of these impacts, along with “gender equality”, “climate change awareness”, “protection of poor and negatively affected communities”, “city and community resilience” are important impacts that should be monitored.

The Energy sector is currently developing a formal MRV system, but until that is completed, data is collected using an informal system. However, there are institutions within the sector that collects data that can support monitoring of GHG and non-GHG impacts for the country, as in Belize Electricity Limited (BEL) that generates yearly reports that contribute to both impacts. As an example, operating and finical performance data that contributes to non-GHG impacts tracking. To the sector, data/information on GHG emissions and emission reduction is partially collected, similarly to non-GHG impacts. Regardless, there are platforms such as the BNSS and the GHGI that can also complement tracking of GHG and non-GHG impacts which would improve monitoring efforts. Based on the information provided in *(table 6*), this information must be monitored. As seen in *(Annex 4),* the Energy sector’s MRV system is under development and is oriented with energy statistics but incorporating facets of non-GHG impacts into the system would

enhance the monitoring for the Energy sector. It is also important to highlight that the MRV system being developed under the sector will be tracking the sector commitments put forward in the NDC.

The findings for the Transport sector show's a formal MRV system that exists, the "National database for vehicles registered" (*see Annex 5*). This database does not capture information relating to GHG and non-GHG impacts, nonetheless, GHG emissions for the transport sector are recorded in the GHGI. As with most of the sectors, other platforms exist that have supporting data that contributes to non-GHG impacts such as the BNSS. Currently, the national database for vehicles does not capture any of the information in (*table 7*) for the transport sector, which are all important impacts that should be monitored.

As it relates to the water sector, non-GHG impacts are collected for which a formal MRV system does not exist. Aspects of "Access to adequate water supply" and "Enhance the protection of water catchment (including groundwater resources) areas and make improvements to the management and maintenance of existing water supply systems through implementation of the National Water Sector Adaptation Strategy and Action Plan" are not yet monitored see *(table 8*). Similarly, to the Water sector, the health sector does not calculate emission factors but tracks information on non-GHG impacts. Data that is not yet collected are the indicators relating to "Good health and wellbeing" and "Build adaptive capacity in the health sector by assessing vulnerability and investing in the capacity to respond to climate-related threats" which are important impacts to be monitored for the sector.

As previously stated, there are independent platforms in Belize that already exist that can allow for sharing of information. Some of these are the Belize National Spatial Data Infrastructure (BNSDI), Biodiversity and Environmental Resource Data System of Belize (BERDS), CZMAI's data centre, Caribbean Community Climate Change Centre (5Cs) data clearance house, and the Meteorology Service. These databases should be a part of the National MRV system along with the formal and informal MRVs, data sharing could improve exponentially as these platforms would support the lesser or inferior MRV mechanisms. The effectiveness of data sharing is dependent on these supplementary platforms having established formalized agreements.

Institutions that are most Appropriate to Monitor Identified Missing Impact and Progress Indicators

The consultation sessions that were conducted to identify institution's capacity to monitor missing impacts resulted in stakeholders' request for inclusion of additional indicators that are not seen in deliverable 3. Hence, some indicators within this section of the report were adjusted based on the perspective of the stakeholders and as well as inclusion of the indicators from the NDC implementation plan developed in accordance with the updated NDC for Belize. All indicators from the NDC implementation plan were included along with aspects of non-GHG impacts and non-GHG impact indicators that were developed under the ICAT project. The grounds for not including all non-GHG indicators were essentially on the account that a number of non-GHG indicators are already captured by the indicators within the NDC implementation plan. The table below highlights the institution to monitor NDC targets, missing impacts, and progress indicators.

Table 10 Final Indicators for the MRV System. The indicators included are from the NDC implementation plan and ICAT's non-GHG Impact indicators. Also included are the overall indicator to assess emission reduction, avoided and removed

NDC Target	Actions	Indicators	Baseline	Non-GHG Impact/Indicator	Frequency of tracking	Institution to monitor	Comments
Forestry Emission reduction		**Net GHG emission and removals ktCO2eq/yr**					
Reduce GHG emissions and increase GHG removals related to land use change totalling 2,053 KtCO2e cumulative over the period from 2021 to 2030	Complete the REDD-plus Strategy including options, implementation framework and assessment of social and environmental impacts, publish and maintain a National Forest Reference Emission Level and a Forest Reference Level covering 2006-2020	Consolidation and publication of strategy, including options, implementation framework and assessment of social and environmental impacts by 2021	In development		Annually	NCCO	
		Consolidation and publication of forest inventory up to 2020 (2015-2020) by 2021	National Forest Reference Level published 2020 (2000-2018)	**Capacity, skills and knowledge development/** Number of youth and adults who have received scientific, technological or other skills training in sustainable forest management	Annually	Forest Department	
		Forest/emission reference level submitted for approval to the UNFCCC by 2021	National Forest Reference Level and Technical Assessment Report approved		Annually	Forest Department	

			and published by UNFCCC				
	Implement reforestation practices for 1,400 hectares in forest areas inside protected areas, as well as the restoration of 6,000 hectares of degraded and deforested riparian forest by 2030 with 750 hectares of this being restored in key watersheds by 2025	Hectares of forest restored in protected areas	0		Annually	Forest Department	
		Hectares of forest restored outside protected areas	0			Forest Department	
	Reduce degradation in 42,600 hectares of forest within protected areas by reducing fire incidence, improving logging practices, and controlling other human disturbance by 2030	Hectares of forest within protected areas with improve logging practices	0		Annually	Forest Department	
		Number of fire incidence started within protected areas	0		Annually	Forest Department	
	Assess potential to reduce emissions related to fuelwood collection and use including an assessment of social and cultural impacts and collection of data on current fuelwood use in local communities throughout Belize and incorporate findings into forestry sector strategies	Change overtime of fuelwood collection and usage	0		Annually	Forest Department	
		Number of assessment conducted to reduce emission from fuelwood collection	0		Annually	Forest Department	
		Number of local communities dependent on forest resources	0		Annually	Forest Department	
	Incorporate and monitor agroforestry practices into at least 8,000 hectares of agricultural landscapes by 2030 by planting shade trees. In line with the draft National Agroforestry Policy, with an additional 4,500 hectares by 2025 conditional on adoption, implementation and	National Agroforestry Policy adopted by 2022	Completed		Annually	NCCO	
		Implementation of agroforestry practices monitored by 2023	Monitoring program implemented			Ministry of Agriculture	
		Number of hectares under agroforestry practices including trees planted by 2025	Needs to double check		Annually	Ministry of Agriculture	

	financing of the agroforestry policy						
	Promote and monitor the stewardship of 10,000 hectares of local community and indigenous people's lands as sustainably managed landscape to serve as net carbon sinks	Strategy for promotion of community land stewardship practices developed by 2022	0		Annually	NCCO	
		Implementation of sustainable forest management in local communities monitored	Monitoring program implemented		Annually	Forest Department	
	Explore alongside Article 6 of the Paris Agreement, new financing options to support forest protection and restoration, including REED+ performance-base payments, multilateral and bilateral funds, insurance products, debt-for-nature swaps, private investments, carbon credits and bonds, and other innovative conservation financing mechanisms	Assessment of finance options for forests by 2022	TBD		Annually	NCCO	
Implement protection targets of the National Biodiversity Strategy Action Plan including increased effectiveness of the National Protected Areas System by 2024	Implement a biosafety policy that safeguards against large-scale loss of biological integrity	Biosafety policy update and implement to protect biological integrity by 2023	Developed in 2009(BAHA)		Annually	BAHA	
	Broaden the analysis of the vulnerability of ecosystems, species and local communities in or near Protected Areas to understand the risks and impacts of climate change on resources	Assessment of vulnerability of ecosystems and species within and near protected areas completed by 2022	Threatened species list for Belize (2021)		Annually	National Biodiversity Office	
		Adaptation strategies updated to reflect vulnerabilities identified for protected areas by 2024	0		Annually	National Biodiversity Office	
	Implement monitoring and evaluation of NBSAP and its targets, and maintain up-to-date data	National Biodiversity targets aligned with MRV system outputs	0		Annually	National Biodiversity Office	

	base on natural resources and environmental services to inform policy decisions across government	for forest and marine sector by 2022					
		Accessible and updated database of NBSAP actions developed *by* 2022	0		Annually	National Biodiversity Office	
Coastal & Marine Emission Avoided and removed	**Action**	**Indicator** **Net GHG emission avoided ktCO2eq/yr** **Net GHG emission removed ktCO2eq/yr**	**Baseline**	**Non-GHG Impact**	**Frequency**	**Institution to monitor**	**Comment**
Enhance the capacity of the country's mangrove and seagrass ecosystems to act as a carbon sink by 2030, through increased protection of mangroves and by removing a cumulative total of 381 KtCO2e between 2021 and 2030 through mangrove restoration	Building on the 12,827 hectares of mangroves currently under protection, protect at least a further 6,000 hectares of mangroves by 2025, with an additional 6,000 hectares by 2030.	Number of additional hectares of mangroves protected by 2025 Tons of emission reduced from the hectares of mangrove areas restored and protected	12,827 ha under protection	**Gender equality/** Ratio of women employed	Annually	Forest Department	
	Restore at least 2,000 hectares of mangroves, including within local communities, by 2025, with an additional 2,000 hectares by 2030	Number of hectares of mangroves naturally regenerated by 2025	0		Annually	Forest Department	
		Number of hectares of mangroves replanted by 2025	0		Annually	Forest Department	
	Halt and reverse net mangrove loss by 2025 through public measures and partnerships with private landowners local communities	Number of partnerships established with landlords, local communities, bilateral and multilateral agencies by 2022	Belize Mangrove Alliance established, 2021	**Protection of poor and negatively affected communities**/ Number of Climate Change projects to support resource dependent coastal communities	Annually	National Biodiversity Office	
		Share of publicly owned areas identified in the Government's mangrove priority	2,055 ha mangrove priority areas within NPAS (includes both		Annually	Forest Department	

		areas under conservation by 2025	public and private lands)				
	Assess the value of seagrass habitat contributions to climate regulation to inform development and implementation of a national seagrass management policy, updated national seagrass mapping as part of an updated marine habitat map and identification of a portfolio seagrass areas for protection to enhance conservation	Marine habitat map updated with seagrass areas by 2022	Marine habitat map developed in 1997		Annually	CZMAI	
		Assessment of seagrass habitat contributions to carbon sequestration by 2022	Preliminary figures for Turneffe Atoll identified (not yet published/ finalized)		Annually	CZMAI	
		National seagrass management policy developed and adopted by 2023	No policy		Annually	CZMAI	
		Tons of emission avoided from the degree of implementation of national seagrass policy developed and enhance	0		Annually	CZMAI	
		Priority seagrass areas identified for protection to enhance conservation by 2023	None officially stated identified		Annually	CZMAI	
	Complete an in-situ assessment of the below ground carbon stock of mangroves by 2022, leading to the application of relevant IPPC methodologies to assess the feasibility of including seagrass in wetlands component, alongside a comprehensive assessment of mangrove-based carbon-stock	Incorporation of results from in-situ assessment of below ground carbon stock of mangroves into Greenhouse Gas Inventory by 2022	National Forest Reference Level includes above-ground mangrove forest		Annually	Forest Department	

	Explore alongside Article 6 of the Paris Agreement, new financing options to support mangrove protection and restoration, including multilateral and bilateral funds, debt-for -nature swap, private investments, blue carbon credits and bonds, and other innovative conservation financing mechanisms	Assessment of finance options for mangroves by 2022	TBD		Annually	NCCO	
	Throughout delivery of land use interventions related to this target, promote the stewardship of local community and indigenous people's coastal lands as sustainably managed landscapes to serve as net carbon sinks	Strategy for promotion of community land stewardship practices developed by 2022	0		Annually	CZMAI	
		Implementation of sustainable management of indigenous people's coastal lands	0		Annually	CZMAI	
Increase resilience to climate impacts for coastal communities and habitats by managing further development of the coastline to reverse net coastal habitat and land loss by 2025	Conduct vulnerability assessments of the national coastal area to identify threats and trends, including an initial assessment by 2022 and biennial updates to 2030	Updated vulnerability assessment of national coastal area complete by 2024	Initial vulnerability assessment conducted in 2007, integrated vulnerability assessment conducted in 2014		Annually	NCCO	
		Biennial update assessment complete by 2025			Annually	NCCO	
	Establish a public informational clearing house on ecosystem health and human use activities within the coastal zone to share information to support responsible planning in coastal areas by 2023	Public informational clearinghouse on ecosystem health and human use activities in the coastal zone established by 2023	No formal clearinghouse exists; however, CZMAI has a repository of data on ecosystem health and human use activities in the coastal zone		Annually	CZMAI	

	Conduct a study of the impacts of ocean acidification on Belize's coastal habitats and marine resources by 2025	Impact study of ocean acidification on coastal areas and marine resources complete by 2025	Limited studies on the impacts of ocean acidification on marine resources (conch and lobster)		Annually	CZMAI	
		Ocean acidification monitoring program established by 2025	CZMAI has established one monitoring station where parameters for Ocean Acidification		Annually	CZMAI	
	Assess coral reef restoration potential, including opportunities for enhancing habitat functionality to improve the resilience of coastal and marine habitats	Coral reef restoration potential, including opportunities for enhancing habitat functionality assessed by 2025	0		Annually	CZMAI	Needs to be verified by CZMAI
		EWS monitored and detect unhealthy areas of the coral reef developed by 205	0		Annually	CZMAI	
	Revise and streamline current legislation and policies that relate to the management of the coastal zone to eliminate overlaps and close existing gaps and develop a national policy	Assessment of current legislation and coastal development policies to identify areas for improvement completed by 2022	Legislative Review of CZM Act and Regulations conducted and finalized in 2018;		Annually	CZMAI	
		Revised legislation and draft amendments completed by 2023			Annually	CZMAI	
	Update and implement the Integrated Coastal Zone Management Plan, including implementation of an informed	Update Integrated Coastal Zone Management Plan by 2023	ICZMP endorsed in 2016; revision started in late 2020		Annually	CZMAI	

	management zoning scheme and monitoring programmes for the impacts of human use on coastal habitats and marine ecosystems, and link to the emerging national Blue Economy strategy	Update informed zoning scheme for coastal area by 2023	Zoning scheme developed in 2016 and revision to started in 2021		Annually	CZMAI	
		Implement informed zoning scheme for coastal area by 2025	Zoning scheme developed in 2016 via Coastal Zone Management Guidelines		Annually	CZMAI	
		Update informed zoning scheme for coastal area by 2023	Zoning scheme developed in 2016 and revision to started in 2021		Annually	CZMAI	
		Develop National Blue Economy Strategy by 2022	No strategy in place		Annually	Policy and Planning Unit, Ministry of the Blue Economy and Civil Aviation	
	Develop and implement a national marine dredging policy with robust guidelines for minimizing impacts to coastal wetlands and coral reefs	Develop national marine dredging policy with guidelines for minimizing coastal impacts by 2023	No policy in place		Annually	Ministry of Natural Resources, Petroleum and Mining	
Strengthen the resilience of coastal communities by developing an early warning system for storm surges by 2025	Monitor coastal erosion and update coastal adaptation strategy every 5 years through the development of a National Beach Erosion Monitoring program	Coastal adaptation strategy developed by 2025	No strategy developed		Annually	CZMAI	
		Beach erosion monitoring programme developed by 2025	No plan developed			CZMAI	
	By 2023, pilot early warning system for storm surges in 1 coastal district, develop a national	Pilot early warning system for storm surges in 1 coastal district by 2023	No EWS piloted		Annually	National Hydrological Service	

	monitoring system and coastal response plan for storm surges and flooding	Number of coastal districts with early warning systems for storm surges by 2025	No EWS piloted		Annually	National Hydrological Service	
		National monitoring system and coastal response plan for storm surges and flooding developed by 2023	No plan developed		Annually	National Hydrological Service	
Build capacity in fisheries and aquaculture sector through research, diversification and retraining to support livelihoods while protecting coastal ecosystems	Build national capacity to gather climate data to inform management. Develop and implement mangrove and fisheries conservation and management plans	Share of conservation and management plans for marine protected areas updated to include impacts on mangroves and fisheries by 2025	4 out of 9 (44.4%) updated management plans for Marine Reserves have included climate change impacts		Annually	Fisheries Department	
		Share of conservation and management plans for marine replenishment zones updated to include impacts on mangroves and fisheries by 2025	90% of marine replenishment zones are included in Marine Reserves and 44.4% of these have management plans		Annually	Fisheries Department	
	Encourage the development of the sector through value adding and diversification in fish species through research partnerships, private sector engagement	Number of research partnerships established to support diversification in fishing sector by 2025	Current diverse activities include seaweed farming, sea cucumber etc		Annually	Fisheries Department	
	Implement and enforce 2020 Fisheries Act and 2018 Forests (Protection of Mangroves) Regulations. Develop and adopt fisheries regulations to complement the 2020 Fisheries Act.	Regulations to compliment the 2020 Fisheries act developed and adapted by 2023	0		Annually	Fisheries Department	

	Explore the development of alternative livelihood plans for fishers and their households and include alongside further regulation in the sector, capacity building and strengthening of fisher organizations	Number of alternative livelihood plans developed for fishers and households by 2025	No plans developed (no written plan)		Annually	Fisheries Department	
		Number of fisher organizations strengthened by training and other capacity building efforts by 2025			Annually	Fisheries Department	
Energy Targets **Emission Avoided**	Action	Indicator **Net GHG emission avoided ktCO2eq/yr**	Baseline	Non-GHG Impact	Frequency	Institution to monitor	Comment
Avoid emissions from the power sector equivalent to 19 KtCO2e per year through system and consumption efficiency measures amounting to at least 100 GWh/year by 2030	Reduction in transmission and distribution losses from 12% to 10% by 2030 resulting in reduced electricity demand and better quality of supply	Investments in upgrading long-distance transmission network by 2025	USD 18 million planned for grid resilience and viability in 2020	**Energy Independence Security or Sovereignty** And **Access to clean, reliable and affordable energy**	Annually	Belize Electricity Limited	The actions support and captures non-GHG impacts, it does not need to be included. However, it can be mention that the action supports non-GHG impacts.
		Transmission losses (%)	5.8% in 2019		Annually	Belize Electricity Limited	
		Investments in upgrading distribution networks by 2025	USD 15 million planned for grid resilience and viability in 2020		Annually	Belize Electricity Limited	
		Distribution losses (%)	6.1% in 2019		Annually	Belize Electricity Limited	
		Tons of emission reduced from high carbon electricity sources	0		Annually		
	Improve energy efficiency and conservation by at least 10% by 2030 compared to a BAU baseline projection	National Housing Policy developed by 2022	No policy		Annually	Ministry of Infrastructure Development and Housing	
		National Urban Development Policy developed by 2023	No policy		Annually	Ministry of Infrastructure Development and Housing	

		Energy efficiency labelling scheme piloted by 2022	Pilot programme started 2019		Annually	Energy Unit	
		Development of National Standard Building Code by 2022	No formal building code in place		Annually	Ministry of Infrastructure Development and Housing	
		Building codes formally adopted in national legislation by 2023	0		Annually	Ministry of Infrastructure Development and Housing	
		Implementation of energy conservation measures (ECMs) in public buildings	ECM not implemented		Annually	Energy Unit	
		Finance mobilized for energy efficient investments by MSMEs by 2025	TBD		Annually	Development Finance Corporation	
Avoid 44 KtCO2e in the national electricity supply by 2030 through the introduction of expanded capacity from renewable energy sources	Achieve 75% gross generation of electricity from renewable energy sources by 2030 through the implementation of hydropower, solar, wind and biomass, including in the tourism sector	% of gross generation of electricity from renewable energy sources by 2025	59% of gross generation was from renewable energy sources in 2018		Annually	Belize Electricity Limited	
		Number of renewable energy bankable projects prepared by the Ministry by 2025	2 off-grid solar PV projects currently being developed		Annually	Energy Unit	
		Emissions (tCO2e) avoided with new renewable energy projects by 2025	680 KtCO2e estimated from total primary energy supply for 2020 baseline		Annually	Energy Unit	

	Reduce emissions from high carbon electricity sources including through taking 2MW diesel generation offline by 2021 and converting new LPG generation to CNG by 2026	MW of fossil fuel generation capacity retired or converted to less emissive technologies	2 off-grid solar PV projects currently being developed		Annually	Belize Electricity Limited	
	Install 40 MW utility-scale solar power and 19 MW additional hydropower capacity by 2025	MW of renewable energy in operation by 2025	76 MW installed in 2018		Annually	Belize Electricity Limited	
	Implement feed in tariff policy and regulatory framework to facilitate distributed renewable power generation by 2022	Interconnection policy (a policy to facilitate the interconnection of renewable energy to the grid) developed and implemented by 2022	No policy in place		Annually	Public Utilities Commission	
		Regulations to facilitate the interconnection of renewable energy to the grid developed and implemented by 2022	No regulation in place		Annually	Public Utilities Commission	
	Expand the use of biomass, including bagasse, for electricity generation	Assessment of generation potential from biomass including bagasse	No assessment		Annually	Energy Unit	
	Explore the feasibility of onshore wind power generation and flexible storage technologies to complement high levels of variable renewable power sources	Assessment of generation potential from solar and wind energy (onshore and offshore)	Pilot assessment planned for BELCOGEN biomass project		Annually	Belize Electricity Limited	
		Assessment of flexible energy storage feasibility	No assessment		Annually	Energy Unit	

Transport **Emission Avoided**	Action	Indicator **Net GHG emission avoided ktCO2eq/yr**	Baseline	Non-GHG Impact/Indicator	Frequency	Institution to monitor	Comment
Avoid 117 KtCO2e/year from the transport sector by 2030 through a 15% reduction in conventional transportation fuel use by 2030 and achieve 15% efficiency per passenger- and tonne-kilometre through appropriate policies and investments	Improve efficiency in the public transit system through the deployment of 77 hybrid and electric buses by 2030 (17 by 2025)	Number of hybrid buses deployed by 2025	0	**City and community resilience/** Number of new projects to support climate-resilient transport infrastructure	Annually	Ministry of Transport	
		Number of electric buses deployed by 2025	0			Ministry of Transport	
	Implement a policy framework to promote more efficient vehicles and alternative fuels/blends through incorporation of fuel economy labels; emissions testing	Fuel economy labelling standards developed and implemented by 2025	No labeling standards in place		Annually	Ministry of Transport	
		Emissions testing regulations developed and implemented by 2025	No emissions testing regulations		Annually	Ministry of Transport	
		Fuel economy standard regulations developed and implemented by 2025	No fuel economy standard regulations		Annually	Ministry of Transport	
		Fiscal incentives for improved energy efficiency in imported vehicles developed and implemented by 2025	No fiscal incentives in place		Annually	Ministry of Transport	
		Number of imported vehicles that receive emission-based taxes	0		Annually	Ministry of Transport	
		Amount of foreign currency saved on imported fuels	0		Annually	Ministry of Transport	

	Facilitate adoption of electric vehicles in the passenger fleet by conducting a feasibility study for EV penetration, including assessment of potential incentives, and investing in EV charging infrastructure	Feasibility study of EV penetration complete by 2022	Feasibility study ongoing		Annually	Belize Electricity Limited	
		Assessment of potential incentives for uptake of EVs complete by 2022	Assessment is ongoing		Annually	Belize Electricity Limited	
		Development of regulations and incentives scheme for EV uptake by 2024	No regulations and incentives scheme in place		Annually	Ministry of Transport	
		Number of EV charging stations deployed by 2025	1		Annually	Belize Electricity Limited	
Agriculture	**Action**	**Indicator**	**Baseline**	**Non-GHG Impact**	**Frequency**	**Institution to monitor**	**Comment**
Emission reduction		**Net GHG emission removed ktCO2eq/yr**					
Reduce methane emissions from livestock by 10% by 2030 and avoid emissions of at least 4.5 ktCO2e related to agriculturally driven land use change by 2025	Improve the management of 80,000 hectares of the agro-landscape through good agricultural and silvopastoral practices including by bringing 30,500 hectares under sustainable agriculture system with biodiversity benefits and 15,000 hectares in production systems under sustainable land management	Number of hectares under sustainable agriculture practices with biodiversity benefits by 2025	0	1.Climate change awareness, 2.Capacity, skills and knowledge development 3.Agricultural productivity and sustainability	Annually	Ministry of Agriculture, Food Security, and Enterprise	The non-GHG impact does not need to be included, seeing that it is already captured in the implementation plan
		Number of hectares in production systems under sustainable land management practices by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
	Restore 200 hectares of arable sugar land in Northern Belize that has been denuded over time by use	Number of hectares of sugar land restored to arability by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	

	Promote the reduction of agricultural GHG emissions through altering crop cultivation method, including green mechanical harvesting in sugar cane production systems	Specific campaign highlighting sustainable practices in sugar cane production delivered by 2024	Pilot program started 2017		Annually	Ministry of Agriculture, Food Security, and Enterprise	
	Promote the reduction of agricultural GHG emissions through implementing effective livestock management that involves changing	Capacity building program for livestock sector designed by 2021	No program developed		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of livestock farmers reached by capacity building program by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of youth reached by capacity building program by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of women reached by capacity building program by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Avoided methane emissions from livestock by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Tons of emission reduced by the number of farms adapted altering crop cultivation methods	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Tons of emission reduced from the number of farmers implementing	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	

		effective livestock management					
Reduce 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	Mobilize infrastructure investments for Climate Smart Agriculture (CSA) as set out in the National Adaptation Strategy to Address Climate Change	% of short term actions delivered by 2025	0 % of actions delivered		Annually	Ministry of Agriculture, Food Security, and Enterprise	
	Establish a financing facility for CSA investments through local financial institutions	Concept note for financing facility developed by 2022	No concept note developed		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Financing facility formally established by 2023	No facility established		Annually	Ministry of Agriculture, Food Security, and Enterprise	
	Improve both crop and livestock husbandry practices, increase access to drought tolerant crops and livestock breeds through partnerships with research institutions	Research partnerships established with institutions by 2025	2 partnerships		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of drought tolerant seeds distributed to farmers	3		Annually	Ministry of Agriculture, Food Security, and Enterprise	
	Adopt better soil and water management practices, including the use of biochar and improved (solar-powered) irrigation systems	Ha of agricultural lands using biochar by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Ha of agricultural lands using solar-powered irrigation systems by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
Develop and implement an enhanced early warning system for drought and extreme weather events to support farmers in planning	Expand on the Belize Agriculture Information System to reach a broad awareness amongst relevant populations of hazards and best practices	Awareness program designed by 2022	1		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of farmers reached by awareness campaign by 2025	2000		Annually	Ministry of Agriculture, Food Security, and Enterprise	

for and responding to the impacts of climate change by 2025		Number of women reached by awareness campaign by 2025	250		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of youth reached by awareness campaign by 2025	100		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of farms using BAIMS by 2025	14200		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of farmers using BAIMS by 2025	2696		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Ha of agricultural land included in BAIMS	233,746.57		Annually	Ministry of Agriculture, Food Security, and Enterprise	
	Explore crop and commodity insurance schemes and pilot insurance product including education and awareness raising campaign by 2024	Study of crop and commodity insurance schemes complete by 2023	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Pilot of agriculture insurance schemes delivered by 2024	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of farmers reached by awareness campaign by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of women reached by awareness campaign by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	
		Number of youth reached by awareness campaign by 2025	0		Annually	Ministry of Agriculture, Food Security, and Enterprise	

Human health Target	Action	Indicator	Baseline	Non-GHG Impact/Indicator	Frequency	Institution to monitor	Comment
Build adaptive capacity in the health sector by assessing vulnerability and investing in capacity to respond to climate-related threats	Undertake a Climate Change Vulnerability and Capacity Assessment for the health sector by 2022	Assessment of Belize's health sector climate change vulnerability and response capacities completed by 2022 for arboviruses (expand on initial assessment)	An assessment was conducted and submitted as part of Belize's Second Communication	**Good health and wellbeing/** Percent of the population at risk of vector-borne diseases	Annually	Ministry of Health & Wellness	
	Improve disease control and prevention including through the management of disease vectors, through partnerships with research institutions	Number of research partnerships established for the control and management of climate-related disease by 2025	CDC, Uniform Services Unitversity, Baylor University, WHO		Annually	Ministry of Health & Wellness	
		Assessment for the Establishment of Rapid Multi-disciplinary Response Team for Arboviruses	No assessment completed		Annually	Ministry of Health & Wellness	
		Rapid Multi-disciplinary Response Team for Arboviruses established by 2023	No rapid response team in place		Annually	Ministry of Health & Wellness	
		Assessment of capacity of health staff in Integrated Vector Management (Environmental Health and Vector Control)	No assessment completed		Annually	Ministry of Health & Wellness	
		Number of individuals trained in disease control and vector management and demonstrating improved capacity based on assessments before and after training by 2025	10% (of 50) trained		Annually	Ministry of Health & Wellness	

	Implement early warning system for health sector for specific diseases, vectors, and high temperatures by 2025	Number of national disease/vector monitoring plans developed/updated for health sector by 2025	strategic plan for dengue, zika, and chinkungunya (includes integrated vector management monitoring plan completed for arboviruses)		Annually	Ministry of Health & Wellness	
		Review of Early Warning System (endemic channels) for arboviruses completed by 2022	Threshold established for arboviruses		Annually	Ministry of Health & Wellness	
		Incorporation of meteorological indicators in EWS by 2025	EWS currently does not incorporate met indicators		Annually	Ministry of Health & Wellness	
	Facilitate investment in health infrastructure based on findings of sector vulnerability assessment	USD$4,271,575 invested in climate-proofed health infrastructure by 2025	USD$450,00.00 DFID invested		Annually	Ministry of Health & Wellness	
		Establish priority areas for campaign to mitigate climate change impact on health identified by 2021	priority areas not yet established		Annually	Ministry of Health & Wellness	
	Develop education awareness programme to educate population on adaptation measures as it relates to family health and hygiene	Number of awareness campaign for adaptation measures related to health developed by 2023	One campaign being designed under project		Annually	Ministry of Health & Wellness	
		Number of individuals reached by climate-smart health awareness campaign by 2025	No individuals reached		Annually	Ministry of Health & Wellness	

		Number of women reached by climate-smart health awareness campaign by 2025	No- No women reached		Annually	Ministry of Health & Wellness	
		Major communication medium to reach youth for dissemination of climate change health information determined by 2021	No- major communication medium not yet determined		Annually	Ministry of Health & Wellness	
		KAP survey on youth's reception of health climate change information conducted by 2022	No- no KAP survey on youth conducted		Annually	Ministry of Health & Wellness	
		Number of youths reached by climate-smart health awareness campaign by 2025	No- no campaign, no youth reached		Annually	Ministry of Health & Wellness	
Tourism Target	**Action**	**Indicator**	**Baseline**	**Non-GHG Impact/Indicator**	**Frequency**	**Institution to monitor**	**Comment**
Increase the adaptive capacity of tourism sector through the development of climate resilient planning frameworks and infrastructure	Identify and assess coastal tourism areas that are vulnerable to climate change. Assess carrying capacity of sites that are identified as vulnerable	Vulnerability assessment of coastal tourism areas complete by 2022	Vulnerability assessment complete for Corozal, Caye Caulker and Toledo	**Public participation in the policymaking process**/Number of consulted and involved, community and indigenous people (men and women) representatives in policymaking process	Annually	Ministry of Tourism & Diaspora Relations	
		Assessment of carrying capacity of vulnerable sites complete by 2022	No carrying capacity assessments			Ministry of Tourism & Diaspora Relations	
	Update the National Tourism Master Plan to reflect adaptation strategies in the sector by 2023	National Tourism Master Plan updated to reflect adaptation needs for the sector by 2023	National plan not updated with adaptation needs		Annually	Ministry of Tourism & Diaspora Relations	
	Develop area-specific adaptation strategies that provide guidance on adapting to impacts of	Guidance prepared for development of coastal tourism areas	Guidance underway for 2 districts		Annually	Ministry of Tourism & Diaspora Relations	

	climate change, paying keen attention to local and indigenous communities	that reflects adaptation strategies by 2023					
	Provide support to coastal planners and policy makers in selecting appropriate policies and adaptation strategies that meet climate adaptation, developmental and environmental goals	Number of site-specific adaptation strategies developed for tourism sector by 2023	Disaster and Climate Reslience Plans underway for Corozal and Toledo Districts		Annually	Ministry of Tourism & Diaspora Relations	
	Install appropriate infrastructure in local destinations for adaptation to climate change including specific infrastructure related to roads, bathroom facilities, buoys, renovation of docks and wayfinding	Number of site-specific infrastructure investment plans for tourism areas reflecting adaptation strategies developed by 2023	Disaster and Climate Resilience Plans underway for Corozal and Toledo Districts		Annually	Ministry of Tourism & Diaspora Relations	
		USD investment in adaptation-specific and climate-proofed infrastructure in tourism sites by 2025	USD 0 invested to date		Annually	Ministry of Tourism & Diaspora Relations	
Water Target	**Action**	**Indicator**	**Baseline**	**Non-GHG Impact/Indicator**	**Frequency**	**Institution to monitor**	**Comment**
Enhance the protection of water catchment (including groundwater resources) areas and make improvements to the management and maintenance of existing water supply systems through implementation of the National Water	Design and implement groundwater hydrological monitoring network to inform drought monitoring activity	Groundwater hydrological monitoring network designed by 2022	No network in place	**Access to adequate water supply**	Annually	National Hydrological Service	The indicator "access to adequate water supply" is address in the implementation plan
		Number of groundwater hydrological monitoring stations active by 2025	No network in place		Annually	National Hydrological Service	
	Develop flood controls and drought monitoring (including both meteorological and	National hydrological drought action plan and monitoring system developed by 2025	No system in place		Annually	National Hydrological Service	

Sector Adaptation Strategy and Action Plan	hydrological drought) including an early warning system for flooding	National Flood Early Warning System (FEWS) for flooding in place by 2025	Partial FEWS in place, but needs to be expanded and consolidated		Annually	National Hydrological Service	
	Design and implement an integrated water resources management (IWRM) program in watersheds to reduce the impacts of climate change, including the establishment of an IWRM agency	IWRM agency launched by 2022	No agency in place		Annually	National Hydrological Service	
		National Integrated Water Resources Management program initiated by 2023	No agency in place		Annually	National Hydrological Service	
		National Water Resources Adaptation Plan developed by 2023	No adaptation plan in place		Annually	National Hydrological Service	
		Aquifer characteristics for the transboundary Yucatan Candelaria aquifer determined by 2023	No studies in place		Annually	National Hydrological Service	
		Adaptation Plan for the Candelaria aquifer in place by 2025	No adaptation plan in place		Annually	National Hydrological Service	
		USD investments into climate-proof infrastructure to support water access and resilience by 2025	Under USD $1M invested		Annually	Ministry for Infrastructure Development and Housing	
		Number of hectares of forest restored in key watersheds by 2025	TBD		Annually	Forest Department	
	Establish a national water quality monitoring program, coordinated by a national water quality task group and including monitoring activities for	National water quality monitoring program initiated by 2022	No program in place		Annually	National Hydrological Service (with collaboration with other agencies: DoE,	

	national coastal and ground water areas					CZMAI, FiD, MoH&W)	
		National water quality task group named by 2022	No task group active		Annually	National Hydrological Service	
		Number of annual meetings of the water quality task group by 2023	No task group active		Annually	National Hydrological Service	
		National comprehensive water quality monitoring system in place by 2023	No system in place		Annually	National Hydrological Service	
Waste Targets	**Action**	**Indicator**	**Baseline**	**Non-GHG Impact/Indicator**	**Frequency**	**Institution to monitor**	**Comment**
Emission Avoided		**Net GHG emission avoided ktCO2eq/yr**					
Improve waste management processes to avoid emissions of up to 18 KtCO2e per year by 2030, in line with the national waste management strategy	Close all municipal dumps by 2025 and implement rural waste management system including rural collection and drop off services by 2030	Number of municipal dumps closed by 2025	5 of 11 municipal dumps closed and transfer stations operational	**New business opportunities/** Number of new businesses established from climate change projects from the waste sector/ Number of new investments in waste management (BZD	Annually	Belize Solid Waste Management Authority	
		System in place to facilitate solid waste collection and transport in rural villages for final disposal in the mile 24 regional sanitary landfill designed by 2025	No- No drop off services in place. Technical Cooperation Agreement includes the design of Drop off centers for Rural Communities.		Annually	Belize Solid Waste Management Authority	
	End the open burning of waste by 2025 by	% of waste openly burned in 2025	Yes- Estimated at less than 20%		Annually	Belize Solid Waste	

	extending regular municipal services to all households and commercial premises	Number of households and commercial premises with municipal services to end open burning of waste by 2025			Annually	Management Authority	
		Gap analysis conducted to identify municipal service coverage gaps by 2022	No- Gap analysis not conducted		Annually	Belize Solid Waste Management Authority	
	Develop a legal and policy framework for the sustainable management of solid waste in Belize	Gap analysis conducted to identify regulatory and legal reforms needed to enable development of sustainable solid waste management sector by 2022	Yes- Review of the existing legal/regulatory and institutional framework for solid Waste Management February 2011		Annually	Belize Solid Waste Management Authority	
		Legislative amendments required to improve sustainability of waste sector developed by 2024	Yes- Review of the existing legal/regulatory and institutional framework for solid Waste Management February 2011		Annually	Belize Solid Waste Management Authority	
		Regulations required to improve sustainability of waste sector developed by 2025	No- No new regulations developed		Annually	Belize Solid Waste Management Authority	
Infrastructure Target	**Action**	**Indicator**	**Baseline**	**Non-GHG Impact/Indicator**	**Frequency**	**Institution to monitor**	**Comment**
Protect communities from damage caused by flooding and sea level rise through implementation of	Broaden the analysis of the vulnerability of ecosystems to the effects of climate change to protect potential climate refugees through a	National climate vulnerability assessment of human settlements and refugee flows delivered by 2022	No assessment currently in place	**City and Community resilience/** Number of coastal communities with access to new climate resilient infrastructure or services	Annually	National Climate Change Office	

the Land Use Policy and supporting green and gray infrastructure	comprehensive assessment of human settlements and related infrastructure	National climate vulnerability assessment of infrastructure delivered by 2022	No assessment currently in place		Annually	National Climate Change Office	
	Implement Land Use Policy and Policy Framework to incorporate responsible and climate-sensitive (and water-sensitive) development and land use	Land Use Policy and Framework finalised by 2022	Draft Land Use Policy prepared in 2019		Annually	Ministry of Natural Resources, Petroleum and Mining	
		Land Use Policy and Framework provides mechanism for the incorporation of local and indigenous community land stewardship practices by 2022	No examples of indigenous and local community practices in current draft policy		Annually	Ministry of Natural Resources, Petroleum and Mining	
		Number of climate change adaptation plans for vulnerable areas delivered by 2025	No adaptation plans in place		Annually	National Climate Change Office	
	Develop and implement a climate change adaptation strategy/plan for the most vulnerable local and indigenous coastal communities	Climate-proofed infrastructure investment plan (NCRIP) for vulnerable areas reflecting adaptation and resilience-building strategies updated by 2023	NCRIP not updated since 2013		Annually	Ministry of Infrastructure Development and Housing	
		USD investment in adaptation-specific and climate-proofed infrastructure by 2025	Transport and water investments delivered under Climate Resilient Infrastructure project		Annually	Ministry of Infrastructure Development and Housing	

Monitoring Capacity

The identification of missing GHG and non-GHG impacts that should be monitored consists of the NDC targets, and stakeholder contributions of non-GHG impacts. The evaluation took into consideration both information and assessing whether existing MRV mechanisms are monitoring impacts and indicators shown in *(Table 1-9)*. Table (10) shows the institutions to track missing impacts and indicators consistent with the NDC implementation plan. The results from the evaluation revealed that within certain sectors, although data is collected consistently, a great portion of that information is not related to climate change. Likewise, the existing MRV practices do not capture the relevant GHG and non-GHG impact indicators, resulting in significant gaps. However, based on the inclusion of indicators from the NDC implementation plan, which focus on tracking NDC actions, has provided the option for indicators to be changed to keep within the scope of the NDC activities. This then allowed new indicators to be added to the MRV system. Intrinsically, institutions listed as sector leads to monitor indicators has also been adapted from the NDC implementation plan. Subsequently, the institutions that are listed have the mandate to monitor NDC actions which are highlighted *(table 10*). As a result, in navigating the different institution's capacity to monitor NDC indicators; core values of the institutions were considered. To further assess institution capability, stakeholders also express monetary resources needed to undertake additional responsibility. These institutions comprised of, Forestry, Coastal and Marine, Energy, Transport, Agriculture, Human health, Tourism, Water and Waste which accounts for majority of the countries sectors.

- **Forestry -**The findings from the Forestry sector on monitoring capacity revealed that formal arrangements exist, having the capability to monitor NDC indicators with minimal effort. The National Forest Monitoring System (NFMS) comprised of methods, activities and institutional arrangements geared to produce reliable data on forest activity in particular forest-carbon estimates as emission factors. The Forest Department is the lead government agency advocating for resource management, aligning the impacts to be monitored under the scope of the department should be relatively manageable. Monitoring of GHG and non-GHG impacts/indicators for the forestry sector is under preview of the Forest Department, therefore the institution is ideal for tracking such information.
- **Coastal & Marine -** Coastal Zone/ Fisheries sector shows gaps in GHG and non-GHG impacts, predominantly in the aspect of monitoring non-GHG, "gender equality", and "proportion of poor negatively affected communities". The Coastal Zone Management Authority & Institute (CZMAI) and the Fisheries Department have indicated that both human and financial resources are needed to monitor missing impacts. The CZMAI is mandated to ensure coastal development with a balance to conservation, inclusive of proper adaptive climate change infrastructure development and community engagement. Other supporting institutions tasked with tracking NDC actions includes the Forest Department, Fisheries Department, National Biodiversity Office, Policy and

Planning Unit, Ministry of the Blue Economy and Civil Aviation, and Ministry of Natural Resources, Petroleum and Mining.

- **Energy** - Energy sector identifies GHG and non-GHG impacts that should be monitored, which include emission reduction and emission avoidance targets, and for non-GHG impacts, “energy independence, security & sovereignty” and “access to clean, reliable and affordable energy”. Note that the non-GHG impacts listed for this sector does not have set indicators. This is because the NDC implementation plan indicators support the tracking of non-GHG impacts. The institutions to monitor missing impacts for this sector consists of Belize Electricity Limited (BEL) and the Energy Unit along with its data providers, whereas the Energy Unit would act as the sector leads. The motto for the Energy Unit under the Ministry of Public Utilities and Logistics is achieving energy sustainability gearing towards energy efficiency, renewable energy, clean production, and conservation within all sectors. The missing impacts to track are in accordance with the scope of the institution. As such the Energy Unit is the ideal entity to monitor missing impacts, in accompaniment with BEL. As the entity tasked to distribute and supply safe, reliable sustainable energy, it shows that each institution is suitable to monitor the missing impacts with minimal effort to improve monitoring capacity is the need for data sharing agreements to be established and formalized.
- **Transport**-Traffic Department identifies one non-GHG impact to monitor along with the NDC actions *see table 10 transport section*. The tracking of indicators is aligned with the Comprehensive National Transportation Master Plan which falls within the department mandate. The Traffic Department and the Belize Electricity Limited are the institution tasked to monitor missing impacts for the sector, whereas the Transport Department acting as the lead institution.
- **Agriculture**-The agriculture sector showed gaps for GHG and non-GHG impacts to be monitor. GHG indicators linked to methane emission reduction from livestock and non-GHG impacts resulted in "climate change awareness", "capacity, skills and knowledge development" and "agriculture productivity and sustainability". The appropriate institutions to monitor GHG impacts and NDC actions is the Ministry of Agriculture *(table 10*).
- **Health** - The health sector identifies one GHG impact to monitor which is, “good health and wellbeing”, in addition to all the NDC action targeting “build adaptive capacity in the health sector by assessing vulnerability and investing in capacity to respond to climate-related threats”. The institution tasked to monitor indicators for the sector is the Ministry of Health. The Ministry shows a high prospect of tracking the information with minimal effort. The Health Sector Strategic Plan’s mission advocates innovative and collaborative measures, that support effective service geared towards the wellness of the population and national development. Therefore, the Ministry of Health is the suitable entity to monitor missing gaps.
- **Tourism** - On the account of the tourism sector, one non-GHG impacts is to be monitored. The agency tasked with data collection for the sector is the Belize Tourism

Board (BTB), and Ministry of Tourism & Diaspora Relations would act as the sector lead. The ministry shows high potential to monitor "public participation in policy-making resources" coupled with the tourism sector NDC target. The BTB Digest Report includes information on tourism activities including labour force surveys conducted by SIB. There is a high chance for impacts to be tracked with minimal effort.

- **Water**-The institutions tasked to monitor the NDC action and the non-GHG impact seen in *table 10*, for water sector is the National Hydrology Unit. This institution can monitor the impact with minimal effort as it falls within the purview of Unit's mandate which speaks to conserve and protect water resources to provide a safe adequate and reliable supply for the present and future generation of Belizeans. The institution under this sector namely the Belize Water Service (BWS) alluded to established and formal data-sharing agreements to improve monitoring capacity.
- **Waste**-The institution to monitor missing impacts for both GHG and non-GHG impact indicators for the waste sector is the Belize Solid Waste Management Authority (BSWaMA). The institution was established to ensure sustainable waste management for the country. According to the Belize Fourth Greenhouse Gas Inventory Report, BSWaMA is the entity leading the effort transitioning from waste disposal and burning to managed landfills intended to protect surface water contamination and reduce the accumulation of toxic landfill gases. Reliant on that information, the institution can take account of the missing impacts seen in (*Table 10).* BSWaMA advocates support needed in areas of human resources due to its small staff.
- **Infrastructure-** The institution tasked to track NDC action and non-GHG impacts for the sector encompasses three institutions, namely the NCCO, Ministry of Natural Resources, Petroleum and Mining, and the Ministry of Infrastructure Development and Housing acting as the sector lead.

In summary, the institutions' capacity to monitor information presented in the tables (10) was assessed via consultations on institution's MRV practices (tracking GHG and non-GHG impact/indicators) which provided additional insight on what resources would be needed to accomplish monitoring efforts for the NDC. The overall majority indicated that resources that would be most required stem from a lack of human and financial resources. The institution that requires additional assistant includes Belize Solid Waste Management Authority (BSWaMA), which has a small staff hence the need for human resources. Coastal Zone, Fisheries Department and co-managers for the sector indicated additional support in areas of finance, human resources, and technical capacities to improve monitoring capacity. Likewise, institutions under the Water sector, Belize Water Service (BWS), and the Hydrology Unit signify the importance of third-party assistance.

The institutions that also follow this similar precedent in resources needed comprised of Belize Tourism Board (require third-party assistance), and the agriculture sector requiring third party assistance for additional data to monitor GHG emission reduction. Energy Unit, Belize Electricity Limited (BEL), and the Transport Department did not stipulate any additional

resources needed to improve monitoring capacity, similarly to the Ministry of Health. In accord with the institution's capability to monitor missing impacts to the reporting frequency, the overall majority indicated the reporting frequency is reasonable and can be achieved. Many of the institutions also stressed the lack of data sharing agreements and protocol which emphasized the gap of having something concrete in place to facilitate both data collection and information sharing processes.

Conclusion

In assessing the monitoring capacity of NDC actions, relevant non-GHG and GHG impacts from different MRV systems must be identified. It is important to know what information is already monitored in comparison to what should be monitored to assess monitoring capacity. This would avoid redundancy during the tracking process of NDC actions while facilitating transparency. It is also important to consider non-GHG impacts that encompass impact categories of sustainable development (environmental, social, and economic) identified from climate change projects and climate actions relating to the NDC. Even though non-GHG impacts are not a mandatory requirement in the MPGs, it is still important information to have on a country's effectiveness of climate policies and actions, and their overall contribution to the country's development objectives. Therefore, GHG and non-GHG information should be captured by the national MRV system. Given the gaps shown in the above tables, institutional arrangements are imperative to prioritize and strengthen capacities for data collection and reporting. Establishing clear agreements to lead the coordination and to facilitate the implementation and monitoring of the SDGs and GHGs is fundamental in determining the success of the national MRV system for Belize, together with appropriate guidance and capacity building. In that regard, the continuation of this report will further be presented in deliverable five, to define reporting roles and responsibilities between the relevant institutions and designing the appropriate reporting protocols to facilitate data sharing.

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Institutions Current MRV Practices

The process of obtaining stakeholder response was conducted via Microsoft teams and Google forms. Below are the current MRV experiences identified by stakeholders under the different sectors. **Note**, climate change data within the institutions are limited.

Annex 1. Waste sector MRV Practice

Institutions	MRV experience	Comments
Belize Solid Waste Management Authority (BSWAMA)	A formal MRV system does not exist within the institution. An informal system exists. Referring to the day to day checks and balances of data collection. Data collected -Recovery of Recycled materials (Collected daily) -quantity and weight of the material that goes to the landfill (each truck that arrives at the landfill is weighed using an automated ticketing system. -Hazardous waste disposal Most of the data is stored internal only when a document is published by the solid waste,	**Note: Climate change data is not collected for the Sector (Ozone depletion, Climate change mitigation)** -No signed MOU's with other institutions. -Templates exist for landfill and transfer-station to help in streamlining

Annex 2. Tourism Sector MRV Practice

Institutions	MRV experience	Comments
Belize Tourism Board	A formal system does not exist within the tourism sector; however, an informal system exists for both entities. Work is conducted parallel of each other in data collection and sharing. Data collection for the Ministry is done by BTB BTB has a legal requirement with each hotel. When entering a hotel, you signed a white BTB form, that data with the tax reconciliation data. (every hotel sends this information to BTB).	To reduce gaps the sector is trying to input data in GIS format . Data gaps are filled in gradually **Note**: **Don't collect data on climate change for both institutions**

	• Working relationship with **Belize Immigration Department**, the immigration card goes to the BTB • Market data is collected throughout the year at different port of entry • **Statistical Institute of Belize** survey throughout the year to assess what the tourist like about the destination, how there are spending, how much are coming within their travel groups, where there are coming from. This data is sent to the BTB. • Data is compiled and put in an annual digest at the end of the year • Travel Belize.Org(arrivals and occupancy) update on a monthly basis	
Ministry of Tourism	Data collected • Tourist Arrivals • New investments • Flights/seats Master plan tracking (in implementation • Track Tourism Performance data • Rate of growth • Growth of cruise tourism (-, +) • Internally (ISO9000) • Performance data is recorded year-round (Monthly and quarterly updates- especially relating to arrivals, occupancy rates) • Detail reports are on annual basis	Monitoring tool and internal monitoring tool exist for the sector

Annex 3. Agriculture MRV practices

Institutions	MRV Experience	Comments
CARDI	Type of data collected. e.g. Dependent on the research (height of the plants, flower yields, type of production) • Validation of data-Monitor result base on previously established data (Using reference points) • Dependent on the data, if it is a private institution, an agreement would be made on whether or not the data can be published • All data is collected and keep internally	A formal MRV system does exist for the sector

	• Once the data is brought from the field is then analyzed and sent to the biometricians, to make sure that information is consistent • Reports are then made from that data • They do have public data, articles … • Single publication and joint publication • Staff collects data, if it is outside source that collects the data, they would verify that information • If data is private the institution needs to ask for permission • Everything goes through the head office • Institutional arrangements are only signed by the executive director of CARDI • A contract can be initiated through the Belize office, they have the final decision	
BAHA	There is not a formal MRV system in place but an informal system exists with the institution Responsible for safeguarding the country agriculture • Food safety • Plant health (insect, traps, routes) Phyto-certification • Animal health (sanitary certificate) • Each department is responsible to collect data in the field • Collect data on farmers issues/ complaints regarding farming • Also collect data at the country entry points, plant base, animal products, food products (by quarantine officers) • Data is internal, can be requested • They do have templates based on the international standards to collect certain data Information is shared with united states • Certification are used to verify produce that is being exported • World trade organization • Transparency organizations where you share certain data, data regarding conditions • E.g. Through the IPPC put out a list of pests on their website, which would indicate to other countries that certain pest are not	There is a program for medfly The department follow international standard, governed by international bodies, signatories to the IPPC, international plant protection convention

	present in Belize, if they have it and want to export then they would have to ensure that they are not sending that pest to the country •	
SIRDI	Data collection is done through research officers • Prior to going in the field, a sheet is use to collect data • That information is entered electronically • Both electronic data and raw data is submitted • Data is verified within what they expect from the field using baseline data as reference, so outliers can be identify • Data outliers within dataset are disregarded Data sharing • Data is public, shared with stakeholders, industries, different association, statistical institute • The statistical institute would send a format of how they want that information Example of data • Several experiment at field level (fertilizers, pre-emergent herbicides, irrigation) How often? Depends on the crop cycle • .E.g. For instance, during a crop cycle, goes from the establishment of the harvesting of the sugar cane at establishment they require to take data on germination and evaluation of the crop. • Also, agronomic data that is captured every month (height of the plant, diameter, number of stocks present • After 8 months, quality data is captured (brakes, pole and fiber (Important data at field level) • Harvesting time 15 months, measure the yield, weight within the experimental units • Crop cycle is repeated	
FAO	BAIMS (Belize Agriculture Information Management System)	

	• Record farmer information field data, inputs overtime • Extension officers visit the field to get information from farmers • Using a digital form to collect data • System is updated internally • The system is shared across the ministry and nationally Access is limited to the persons inputting, analyzing and extracting the data presently	

Annex 4. Energy Sector MRV practices

Institutions	MRV experience	Comments
Energy Unit	No formal MRV system in place, through the national energy information system that is currently under development the system will include a module, looking at energy indicators and through that module there are two aspect: Reporting format for GHG emissions base on the IPCC guidelines 2006, also a list of energy indicators and targets base on the international recommendation for energy statistics, this list is currently being developed by the Latin American energy organization. • The indicators that is being reported on is recent and it has been a request of the statistical institute of Belize, for their system • Under that system the energy unit is responsible for 4 indicators, so at this time it would represent one of the main monitoring and reporting format that the organization have. • IRENA is assisting to develop a MRV system for monitoring of mitigation actions and GHG emissions	Sustainable development action plan indicators are somewhat generic and not specific to the action or strategy that were laid out within the sustainable energy strategy e.g. we do have energy efficiency projects within public buildings however there is no concrete MRV system that are tracking these targets specifically, relating to the strategy plan **Currently ongoing the energy unit does not have a concrete system**

SOL-Belize Limited	Data tracking • No formal database • Keep records of our customers tank capacity, sales, volume (encompass within their financial system) • The sharing of data and providing reports, depends on the entity that request that information, once it is not confidential it can be shared	
FLPC	Solar panel-Concern about reliability, and durability, long life span (effort is needed when finding panels) They also look at invertors, they look at efficiency to reduce energy wastage (not only for environmental reason but for bottom line reasons • GHG has synchronize with this manner they concentrate on quality rather than cheap equipment's • They sell on a per customer basis • They are open to use template to share data	FLPC-Function as a cooperative Note: There are independent from the national grid. They are not a supplier Utility and electricity provider for Spanish lookout community

Annex 5. Transport Sector MRV Practices

Institution	MRV Experience	Comments
Transportation	The sector does have a formal system in place. National data base for vehicle registered, driver's license issued (per month, quarterly, annually, male, females), traffic violation tickets etc. • This information will be housed by CITO • The type of information expected from this system (type of vehicles, how many cars, year of manufacture, types of fuel, size of the engine • What age group is driving, • This project is linked to the courts so when someone is charged with a violation, the driver's license can be suspended • The system will identify traffic offenders throughout the country	**Note:** This project is part of the master plan recommendation to put a system in place, it needs the participation of all nine municipalities in order for this project to be a success. Challenges face centered around politics

	• These are some of the outcomes expected for this project • The municipalities have signed an MoU to provide data, not all municipalities have system in place due financial constraints in putting their information digital like in the case of Punta Gorda	

Annex 6. Coastal Zone/ Fisheries MRV Practice

Institution	MRV Practice	Comments
Coastal Zone/Fisheries	A formal system does exist to managed fisher licensing (Manage Access) Data collected (biological and monitoring data e.g lobster, conchs, catch per unit-effort data, how long they spent in the sea, how much fuel was used, types of fish they catch, how much product they obtain from the zone The monitor corals, finfish, seagrass They do have a formal agreement with fisheries, for managing the reserves, also conduct pre- and post-harvest monitoring that data is provided directly to the fisheries dept Information is both analyze by the organization to see how to propel the industry Data is collected throughout the year e.g lobster fishery inventory, that is continuous, that report is forwarded to the fisheries department, for conchs and lobster done pre- and post-season and then during the they also look at the catch data to look at size, where there are obtaining it, areas at times are georeferenced • Along with the university of Belize they look at stock assessment, juveniles, mature to see what is being harvested • Enforcement is done through the smart tool, looking at hotspot illegal activities	

	Also: SMART system to monitor hotspot, and Coastal and marine data center CMDC. Data collected include catch data, comprising of the fish species, length, weight, time spent fishing etc. Additional data that is collected are conch, finfish, lobster which would be used to assess stock and population health. As it relates to CMDC it is used to store spatial information, MoU is signed when data is being used form different entities.	

Annex 7. Water MRV Practice

Institution	MRV Practice	Comments
BWS Hydrology	There is no formal MRV system in place, however, is still guided by a process of data collection, validation, and reporting. The type of data collected includes surface water, streamflow, precipitation, groundwater, water quality. Training is given to personnel collecting data. As it relates to data sharing, data is shared on request, only processed data and information, raw data is not shared.	

Annex 8. Forest sector MRV practice

Institution	MRV Practice	Comments
Forest Dept.	There is a formal system in place. The National Forest Monitoring System. The types of data collected are spatial data on Land Use Change and Biomass/Carbon Stock for different land uses. Ideally the objective of data collection is to monitor carbon stocks and emissions of the country to base on historical and present land-use change and to also monitor the drivers of carbon emissions in terms of land use change from forest. -Data is collected annually -The validation process for data collection and reporting is in the planning phase.	-More funding would assist in the data collection as it is not budgeted for. -There is also need for formal agreements to be developed for data collection, reporting and sharing

	-A team validate data before reaching the relevant users. Templates/ guidelines for data collection and reporting at sectoral level is in the planning phase. -Obstacles to data collection- Data is available, but has a cost, submission of data is non-compulsory -There are no formal agreements in place for collaboration and reporting of data and NDC tracking to the climate change office (Non-formal agreements) -Strategy for data management, including regular updates, backup and archive routine is in the planning phase -Quality control and assurance procedures are partially implemented at the sectorial level	