SCOPING STUDY ON THE CURRENT STATUS OF NDC TRACKING IN THE WASTE SECTOR, CAMBODIA

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Initiative for Climate Action Transparency - ICAT
Scoping Study on the Current Status of NDC Tracking in the Waste Sector, Cambodia

Output A – Report on stock taking Exercise

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Contents

Abbreviations

ADB	Asian Development Bank
BTR	Biennial Transparency Report
BUR	Biennial Update Report
CAD	Climate Action Data
CCCSP	Cambodia Climate Change Strategic Plan
CCTT	Climate Change Technical Team
CCTWG	Climate Change Technical Working Group
CSOs	Civil Society Organizations
DCC	Department of Climate Change
DPs	Development Partners
FBUR	First Biennial Update Report
FOLU	Forestry and Other Land Use
GHG	Greenhouse Gas
GHGI	Greenhouse Gas Inventory
ICAT	Initiative for Climate Action Transparency
IPCC	Intergovernmental Panel on Climate Change
IWW	Industrial Waste Water
JICA	Japan International Cooperation Agency
KAP	Knowledge, Attitudes, and Practices
LFG	Landfill Gas
MAFF	Ministry of Agriculture, Forestry and Fisheries
MAC	Marginal Abatement Cost
M&E	Monitoring and Evaluation
MISTI	Ministry of Industry, Science, Technology and Innovation
MLMUPC	Ministry of Land Management, Urban Planning and Construction
MME	Ministry of Mines and Energy
MoE	Ministry of Environment
MoEYS	Ministry of Education, Youth and Sport
MoP	Ministry of Planning
MoWRAM	Ministry of Water Resources and Meteorology
MPWT	Ministry of Public Works and Transport
MRD	Ministry of Rural Development
MRV	Monitoring, Reporting and Verification
MSW	Municipal Solid Waste
NCSD	National Council for Sustainable Development
NCCC	National Climate Change Committee
NCDD	National Committee for Sub-National Democratic Development
NDC	Nationally Determined Contribution
NGOs	Non-Governmental Organizations
QA	Quality Assurance
QC	Quality Control
RDF	Refuse-Derived Fuel
REDD+	Reducing Emissions from Deforestation and Forest Degradation

SDGs	Sustainable Development Goals
SNA	Sub-National Administration
TNC	Third National Communication
UNFCCC	United Nations Framework Convention on Climate Change
WasCAD	Waste Climate Action Data

1 Introduction

1.1 Background of the scoping study

Cambodia, as a signatory to the UNFCCC and the Paris Agreement, has progressively enhanced its climate commitments, with its updated Nationally Determined Contributions (NDC) in 2020. While Cambodia has developed Monitoring, Reporting, and Verification (MRV) frameworks for forestry (REDD+), energy efficiency (NAMA in garments), renewable energy, and transport, a national MRV framework for the waste sector is still lacking. Current systems, including the NDC platform, do not allow estimation of GHG impacts, requiring focal points to rely on external tools. In this context, the scoping study will undertake a stocktaking exercise to determine the current status of data collection and sources, review institutional arrangements, and identify key priorities for developing an MRV system, projections, and NDC tracking in the waste sector.

1.2 Objectives of the scoping study

The primary objective of this scoping study is to assess and map the current conditions of the waste sector in Cambodia. The results of this study will provide a critical foundation for the development and implementation of a national tracking framework for Cambodia's NDC framework. It will identify key priorities for the MRV system, projections and NDC tracking in the waste sector. By understanding the existing conditions, the scoping study will highlight the gaps in the existing system and provide insights into how these gaps can be addressed through a comprehensive and transparent framework.

2 Current status of data collection and data sources in the waste sector

Globally, the waste sector contributes significantly to global emissions, primarily from landfill methane, wastewater, and open burning. Systematically collected reliable data are critical for policy planning, mitigation actions, and tracking progress against national climate commitments such as NDCs. Many countries lack systematic reporting on key parameters such as waste generation, composition, collection coverage, disposal methods, and recovery rates. Cambodia is not an exception. For MRV purposes, these data gaps can affect the reliability of emission factors and activity data, which are essential inputs for calculating sectoral emissions.

Cambodia, driving towards its international commitments, puts great emphasis on the development of an integrated and detailed MRV system, which is also aimed at achieving the implementation of the NDC (Cambodia’s Initial Biennial Transparency Report, 2024).

2.1 Status of waste sector data collection and data sources in Cambodia

Currently, Cambodia does not have an established greenhouse gas inventory (GHGI) MRV framework for the waste sector. The following figure shows the current MRV types in the country (see Figure 1).

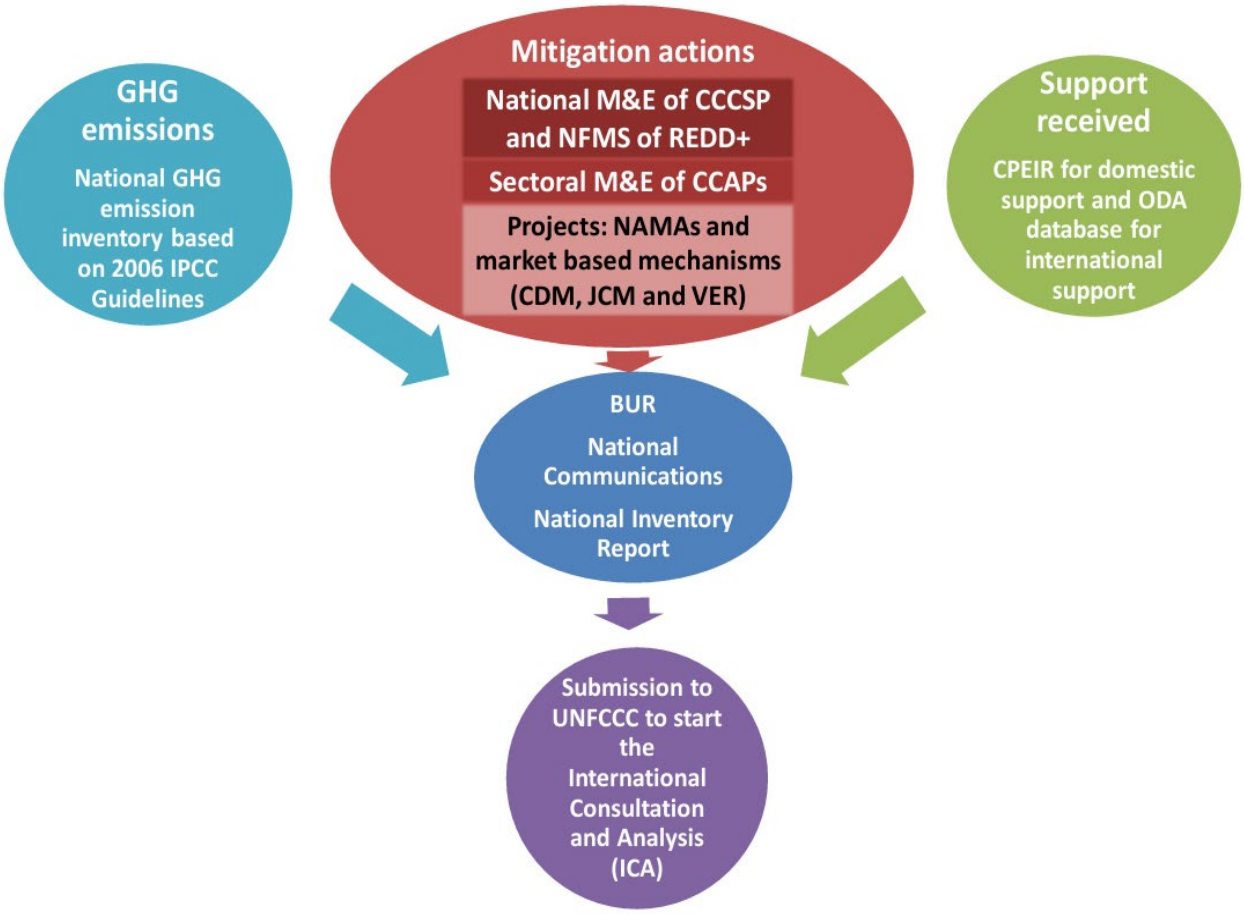

Figure 1: Existing MRV types in Cambodia (Source: FBUR,2020)

The waste sector data collection for the GHGI has been conducted on an ad hoc basis. For the latest GHGI in the first Biennial Transparency Report (BTR), the data were primarily drawn from Cambodia's First Biennial Update Report (BUR) and Third National Communication (TNC) for 1994 to 2016. Where necessary, data for 2016 to 2022 were projected based on observed trends and historical records. The following table shows the waste sector data providers for the latest GHGI in the first BTR (see Table 1).

Table 1: Activity data providers for the GHGI MRV framework in BTR 1

Subcategory	Sources of data
Solid Waste Disposal	Department of Solid Waste Management, General Directorate of Environment Protection, Ministry of Environment
Open burning of waste	Third National Communication of Cambodia First Biennial Update Report (BUR) of Cambodia 2019 GHGI
Domestic Wastewater Treatment and Discharge	National Committee for Sub-National Democratic Development (NCDD)

Furthermore, the first BTR highlighted that data for certain subcategories were drawn from previous climate transparency reports, with consistent records available only for selected years. To address gaps in the time series, projections were developed for years with missing data. While projections help fill these gaps, they introduce additional uncertainty, especially when activity data and emission factors fluctuate over time. This highlights the critical need for a robust MRV framework, which establishes standardized procedures for the measurement, reporting, and verification of emissions, ensuring data consistency, transparency, and reliability.

The NDC tracking platform of Cambodia, which is used to track progress of the NDC actions, is managed by the National Council for Sustainable Development (NCSD). It is the primary tool that is used in Cambodia for NDC tracking purposes. It covers the tracking of mitigation, adaptation, and enabling actions in NDC progress. This system is updated annually by including data that is submitted by the line ministries. This tracking system covers the following tasks,

- Providing the details on status, indicators, and the ministry responsible for each mitigation action covers seven sectors, including energy, waste, industry, transport, agriculture, building and forestry, and other land use (FOLU)
- Providing the details on the adaptation section, including the tracking of adaptation actions and the linkages to the existing vulnerability indicators
- The enabling action section, including the tracking of finance, cross-cutting issues, knowledge, attitudes, and practices (KAP)
- Providing the details on existing readiness indicators
- Providing details on the financial progress of mitigation actions
- Providing additional information on emission reduction projects, emission per sector, and emission per capita
- Providing additional information on the REDD+ program

The NDC 2.0 (2021–2030) actions are already available on the NDC platform, whereas the NDC 3.0 (2026–2035) actions have not yet been uploaded. Data collection for NDC 3.0 actions is still being carried out on an ad hoc basis. Although the platform includes indicators for each NDC and data are collected accordingly, the information is entered manually. Furthermore, the mitigation impacts of the actions are not assessed through the platform. The table below shows the NDCs along with the responsible data providers (see Table 2).

Table 2: Key data providers for NDC 2.0 and NDC 3.0 actions

NDC version	NDCs	Data provider/s
NDC 2.0	New sanitary landfills with LFG extraction and LFG extraction at the Dangkor Landfill	MoE
	Composting of biodegradable organic fraction of MSW supplemented with separation of organic waste (at source)	MoE
	Production of Refuse-Derived Fuel (RDF) from either a) fresh MSW or b) old MSW mined from the Dangkor landfill.	MoE
	Implementation of national 3R strategy	MoE
	Better management of industrial wastewater in the food & beverage sector	MISTI
	Prioritize the construction and upgrading of municipal wastewater treatment facilities	MOE
	Improve wastewater management system to reduce methane emission	MoE, MPWT, JICA, ADB
	Bio-digesters construction (85% reduction compared to 2000) (Small size (2-3-4m^3); Medium size(6-8-10m^3), Large size(>10m^3)	MAFF
	Centralized recycling facility for industrial waste from the garment sector	MISTI
NDC 3.0	Implement solid waste reduction strategies, and pollution control measures	MOE
	Waste collection and segregation at source (at households, schools, markets, restaurants/hotels levels)	MoE with PDoE and SNA
	Increase capacities for organic waste processing	MoE, MAFF, PDoE, SNA
	Introduce alternative SWM processing at existing landfills	MoE with MME
	Landfill management	MoE with PDoE and SNA
	Improve textile waste management capacities	MoE and MISTI
	Industrial wastewater (IWW) management	MISTI

According to the TNC of Cambodia, the projections in the waste sector are based on various factors. The table below describes the data sources and data providers for each factor under the 4 subcategories of solid waste disposal, biological treatment, open burning, and wastewater treatment (see Table 3)(Cambodia's Initial Biennial Transparency Report, 2024).

Table 3: Data providers and data sources of the parameters used for the projections

Sub sector	Parameter	Data Provider	Source	Unit
Solid waste disposal	Municipal solid waste (MSW) generation	Department of Solid Waste Management of the Ministry of Environment	NA	Tonnes
	Population	National Committee for Sub-National Democratic Development (NCDD)	World Bank-database	NA
	GDP	Ministry of Planning (MOP)	World Bank-database	USD
	waste generation per GDP	Ministry of Environment	2006 IPCC default value	Gg
Biological treatment	Population growth rate	National Committee for Sub-National Democratic Development (NCDD)	World Bank-database	NA
Open burning	Population	National Committee for Sub-National Democratic Development (NCDD)	World Bank-database	
	Share of population open burn		Yut S. and Seng B., 2018. KAP	%

Wastewater treatment (Domestic)	Population growth rate	National Committee for Sub-National Democratic Development (NCDD)	World Bank-database	
Wastewater treatment and discharge	Wastewater treatment type	MoE, MPWT, JICA	National sanitation surveys, infrastructure project	Qualitative
Wastewater treatment and discharge	BOD per capita	MoE	IPCC default (60g/person/day)	g/person/day (no specific factor used)

2.2 Gaps and needs in the waste sector MRV framework in Cambodia

The following have been identified as issues in the GHGI MRV for the waste sector in Cambodia.

- Challenges to waste sector data collection include the availability and quality of input data, completeness and accuracy of emissions factors, and data collection difficulties.
- The MRV in the waste sector faces challenges with accurate estimation due to the variability in waste composition, lack of comprehensive waste flow data, and challenges in monitoring methane emissions from landfills and organic waste decomposition.
- Institutional capacity constraints and technical expertise gaps affect the robust implementation of MRV systems for the waste sector.
- Existing methodologies are used globally, but adapting these to Cambodia's specific waste management context requires overcoming barriers related to local data availability, infrastructure, and system integration.
- Key methodological issues also include establishing reliable baseline data, managing dynamic waste streams, and handling informal waste sector activities, which are significant in Cambodia's context.

- Verification of emissions reductions and integrating MRV systems into existing institutional frameworks to ensure sustainability remain complex challenges.

When examining the gaps and challenges in data collection, the updated NDC 2.0 identifies ministry-specific constraints. The Ministry of Land Management, Urban Planning and Construction (MLMUPC) reports on the absence of systems to monitor and evaluate the impacts of climate change interventions. The Ministry of Mines and Energy (MME) highlights limited capacity for data collection and monitoring, compounded by the lack of data management systems. The Ministry of Environment (MoE), as the lead agency for the waste sector, also faces challenges in data management and reporting. Similarly, the Ministry of Education, Youth and Sport (MOEYS) identifies data collection and monitoring systems as a key capacity need. The Ministry of Water Resources and Meteorology (MOWRAM) likewise notes the absence of adequate data and information centers (NDC 2.0, 2020).

The primary gap identified in the NDC tracking platform is the absence of an impact assessment of the indicators linked to NDC actions. To address this, the system needs to be enhanced by integrating an impact assessment feature with appropriate methodologies for calculating emissions associated with the targets. Alternatively, an external tool could be employed to collect and assess data, with the results subsequently integrated into the NDC platform. In addition to this, the following gaps in Cambodia's NDC tracking platform were highlighted during stakeholder consultations**.**

- **Data Acquisition and Availability:** challenges in acquiring comprehensive and consistent data.
- **Technical and Human Capacity:** Limited technical expertise and human resource capacities constrain the ability to maintain robust data systems and ensure accuracy in reporting.
- **Inconsistencies and Standardization:** Variations in NDC structures and reporting mechanisms hinder comparability and complicate tracking across sectors and regions.
- **Cross-cutting Data Deficiencies:** Reporting on themes like gender and youth inclusion suffers from critically insufficient disaggregated data.
- **Integration and Institutional Coordination:** not integrated into a single binding legal framework, which complicates data harmonization within the tracking system.
- **Historical Baseline and Data Gaps:** Compiling coherent baseline data remains a key gap, limiting the tracking system's ability to effectively measure progress against set targets.
- **Demand-Side Accountability:** Public discourse and stakeholder engagement, including legislative involvement, are limited.

- The tracking platform aims at an integrated MRV system with components for mitigation, adaptation, GHG inventory, and support monitoring, but methodological refinements and strengthened data systems are required to fully realize this goal.

According to the first BUR, Cambodia has identified the following priority areas to guide the future development of its MRV systems (FBUR, 2020). It has also identified the need for an NDC impact assessment feature.

- Strengthening institutional arrangements to ensure the effective operation of MRV systems.
- Enhancing the capacities of all institutions engaged in MRV processes.
- Establishing methodologies to assess the support required for NDC implementation; and
- Improving the integration and coordination among different MRV systems Institutional arrangements

2.3 Existing climate change institutional arrangement

In 2006, the Royal Government of Cambodia (RGC) established the National Climate Change Committee (NCCC) as a cross-sectoral and multi-disciplinary body to oversee the development and implementation of climate change-related policies, strategies, and programmes. To support this mandate, the Climate Change Technical Team (CCTT) was formed as an inter-ministerial technical body, with the Department of Climate Change (DCC) serving as its Secretariat.

In 2015, the NCCC was restructured, and its responsibilities were assumed by the National Council for Sustainable Development (NCSD), a more comprehensive inter-ministerial body chaired by the Minister of Environment and with the Prime Minister as its Honorary Chair. The NCSD includes high-level representatives from 36 ministries, agencies, and all provincial governors, significantly broadening its reach and institutional authority. The CCTT was subsequently reorganized into the Climate Change Technical Working Group (CCTWG) in 2017, to provide technical and advisory support to the NCSD in policy development, reporting, capacity building, and international engagement.

The NCSD oversees the development, coordination, and monitoring of climate strategies and instruments, including the Cambodia Climate Change Strategic Plan (CCCSP) 2014–2023, sectoral action plans, and the Climate Change Financing Framework. Its coordination efforts are supported by biennial multi-stakeholder consultations. At the operational level the General Secretariat of the NCSD serves as the national focal point to the UNFCCC and the General Directorate of Policy and Strategy (GDPS) of the MoE supports NCSD operations and coordinate the development of policies, strategic plans,

action plans, and legal instruments related to sustainable development, including the green economy, climate change, biodiversity conservation and biosafety, and science and technology.

The Department of Climate Change (DCC), under the GDPS, serves as the lead technical agency for climate change adaptation, mitigation, and reporting. It plays a pivotal role in coordinating efforts across government institutions, integrating climate action into national planning and budgeting frameworks, and facilitating capacity building and stakeholder engagement (Cambodia NDC 3.0, 2025). Further, it plays a central role in preparing national climate reports such as GHG inventories and Biennial Update Reports, coordinating the implementation of climate actions, mobilizing climate finance, and managing public awareness, data systems, and inter-agency collaboration.

The CCTWG provides technical support to the NCSD in advancing climate change action in Cambodia. It plays a critical role in facilitating cross-ministerial coordination and ensuring effective decision-making and implementation by key line ministries. The CCTWG comprises 38 officials representing 22 ministries and government institutions (Cambodia NDC 3.0, 2025). Together, the NCSD, CCTWG, and DCC form a robust institutional architecture for advancing Cambodia's climate resilience and mitigation objectives.

Development Partners (DPs) play a crucial role in advancing Cambodia's climate change agenda. In addition to providing financial support for key initiatives, they maintain strong, long-standing partnerships with government ministries, enabling strategic and targeted assistance in priority areas. DPs actively participate in policy development processes, offering technical expertise and guidance throughout (Cambodia NDC 3.0, 2025). Non-Governmental Organizations (NGOs) and Civil Society Organizations (CSOs) play a vital role in shaping and advancing climate policy in Cambodia. Their engagement helps ensure that climate action is inclusive, transparent, and responsive to the needs of local communities. By bridging the gap between policy and implementation, they facilitate the dissemination of critical information on climate change, policies, and adaptation strategies to the public and local stakeholders. NGOs and CSOs also provide technical, financial, and logistical support to enhance community resilience and adaptive capacity (Cambodia NDC 3.0, 2025).

2.4 Existing institutional arrangement of the NDC tracking platform

The institutional arrangements for Cambodia's climate response are anchored in the establishment of the NCSD and its Secretariat (GSSD) in 2015 (mandated through Royal Decree No. NorSor/RorKorTor/0515/403 and Sub-Decree No. 59 OrNorKrar.BorKor). In 2017, the Climate Change Technical Working Group (CCTWG) was further created under Prakas No. 002 S.S.R NCSD. Together, these institutions are responsible for coordinating

climate policy and for overseeing the development and management of monitoring and evaluation (M&E) instruments, including the national M&E framework that underpins NDC implementation and tracking.

The figure below illustrates the institutional arrangement of the NDC platform of Cambodia (see Figure 2).

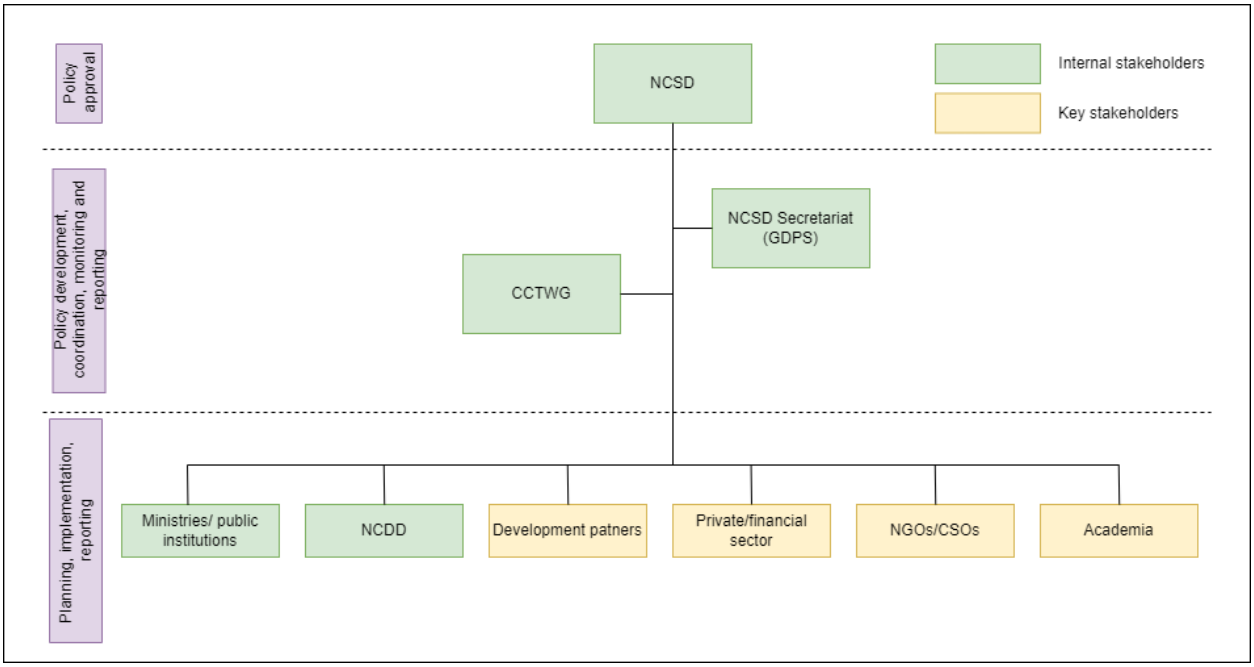

Figure 2: Institutional arrangement of the NDC tracking platform (Source: NDC platform of NCSD)

As in the above figure, the stakeholders have defined roles and responsibilities. The table below summarizes the roles and responsibilities of the stakeholders (see Table 4).

Table 4: Roles and responsibilities of the institution responsible for the NDC platform

Institution / Group	Roles and Responsibilities
NCSD Board	• Provide overall direction and coordination of the M&E framework • Approve biennial M&E/BTR reports • Recommend adjustments to Cambodia's climate change response
NCSD Secretariat (GDPS) – Department of Climate Change, Policy and Coordination Office	• Lead annual updates of M&E framework indicators with MoP and relevant institutions • Facilitate CCTWG scoring of institutional readiness indicators • Establish mechanisms for automated, quality-assured data transfer • Provide QA through validation checks

	• Prepare biennial M&E reports and summaries of annual indicator updates • Disseminate M&E findings via climate change web portal and other means • Propose improvements to the framework and information system • Support sectors in developing sectoral CC M&E frameworks • Facilitate practitioner discussions for inputs and framework development
CCTWG (Climate Change Technical Working Group)	• Participate in updating institutional readiness indicators • Liaise with member institutions for data sharing (primary and secondary) • Provide inputs for M&E/BTR reports, including analysis and policy recommendations • Contribute to framework development and system improvement • Promote alignment of climate-related M&E instruments with the national framework • Ensure sectoral M&E frameworks are aligned with the national framework • Disseminate findings and recommendations from the national M&E results
Ministries / Agencies (members of CCTWG)	• Support their CCTWG representatives in performing their roles effectively and on time
Other Stakeholders (development partners, NGOs, private sector, research institutions, practitioners)	• Provide feedback on the use of the national M&E system • Contribute to improving monitoring and evaluation capacity • Support operationalization and broader use of the M&E framework

2.5 Gaps in existing institutional arrangements

Human and institutional capacity gaps

Cambodia faces a shortage of experts and researchers specializing in waste-sector mitigation. Moreover, systematic coordination among relevant ministries and agencies remains limited, undermining effective cross-sectoral integration of climate policies. Although the government has begun transition from international technical support to nationally led efforts, it continues to require enhanced technical capacity, institutional coherence, and expanded support for research and academia in priority areas like climate impact assessments, economic analyses, and climate finance.

Technical and systemic barriers in inventory

The country's waste-sector inventory system is underdeveloped and relies heavily on project-based data collection without a permanent institutional framework. Key challenges include the lack of reliable and consistent activity data. There is no centralized data management platform to integrate information from ministries, municipalities, and private operators. Limited technical expertise at national and subnational levels further constrains the application of methodologies.

2.6 Proposed Institutional Arrangement for NDC tracking

The first BTR of Cambodia has proposed an institutional arrangement for the NDC tracking process (see Figure 3).

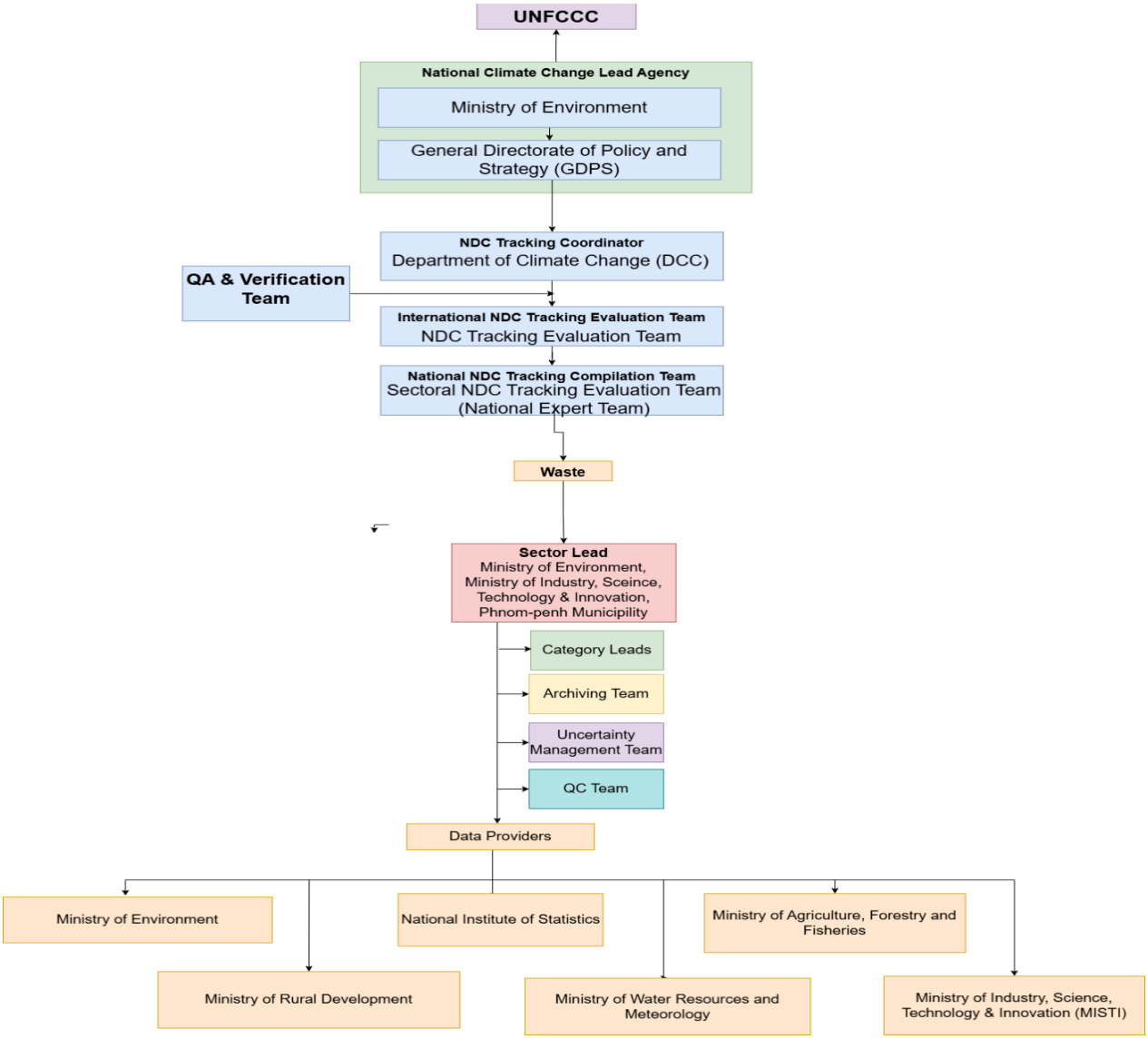

Figure 3: The proposed institutional arrangements of the Waste sector for NDC progress tracking, as outlined in Cambodia's Biennial Transparency 1 Report (The Kingdom of Cambodia, 2025)

The proposed institutional arrangements, as outlined in Cambodia's Biennial Transparency Report (BTR), introduce a more structured and comprehensive approach to managing sectoral data and improving transparency in the NDC tracking process.

At the sectoral level, each sector category now includes designated teams for:

- Category Lead
- Archiving
- Uncertainty Management
- Quality Control (QC)

Key data providers for the waste sector were identified.

- Ministry of Environment (MoE)
- Ministry of Rural Development (MRD)
- National Institute of Statistics (NIS)
- Ministry of Water Resources and Meteorology (MoWRAM)
- Ministry of Industry, Science, Technology and Innovation (MISTI)
- Ministry of Agriculture, Forestry and Fisheries (MAFF)

At the national level, institutional arrangements have been revised to support NDC tracking, with some structural differences:

- NDC tracking, a National NDC Tracking Compilation Team, has been introduced to collect and compile information from various sectors.

To ensure accuracy and consistency:

- An International NDC Tracking Evaluation Team has been introduced to review and assess the compiled data for NDC tracking.
- A Quality Assurance (QA) and Verification Team is presented in the arrangements to further validate the data before it is submitted to the Department of Climate Change (DCC), which acts as the national coordinator.

3 Key priorities for the MRV system, projections, and NDC tracking in the waste sector

The analysis highlights that Cambodia requires a dedicated platform to systematically track progress on NDC activities in the waste sector. Since the NDC platform does not have methodologies to calculate GHG impact assessment, there is a need to have a tool to fill this gap. To achieve this, the collection of activity data must be aligned with defined methodologies that enable accurate calculation of climate impacts from NDC actions. In this regard, the Waste Climate Action Data (WasCAD) Tool, developed under the Initiative for Climate Action Transparency (ICAT), provides a practical solution.

The WasCAD tool supports comprehensive progress tracking, data collection, and climate impact assessment for the waste sector. It is built on the Climate Action Data (CAD) framework, which consists of five interlinked modules, namely the climate action module**,** GHG impact assessment module**,** cost module**,** data management module**,** and GHG inventory module**.** Among these, the GHG impact assessment module plays a central role by quantifying the emissions impact directly attributable to climate actions in the waste sector. The climate action module collects mitigation actions and those actions under the commitments of NDCs. The impact assessment module assesses the GHG impact of waste sector methodologies. Currently, the tool has 10 waste sector-specific methodologies. The cost module assesses the additional costs associated with climate actions. Marginal Abatement Cost (MAC) assessment can be conducted for the waste sector using this module. The data management module links data providers and data collectors, collects data required for GHG impact assessment, collects data required for MAC assessments, assesses GHG and additional costs of mitigation actions, and tracks the mitigation actions. The GHG inventory module collects activity data for GHG inventory emission sources from data providers, creates GHG inventories, and exports XML files that are compatible with the IPCC software.

4 Conclusion

At present, since the NDC platform does not provide a mechanism to calculate the GHG impact of individual NDC actions, this scoping assessment proposes integrating tools for quantifying GHG impacts, such as the WASCAD Tool developed by ICAT.

The current online tracking system already collects data such as location, annual progress, technology availability, relevant SDGs, financial costs, required capacity support, and private sector involvement for each action. Building on this, the GHG impact assessment can be embedded into the Online NDC Tracking Platform through this assessment. The following approach was prepared by incorporating the MRV framework

to estimate the GHG impact assessment into the Online NDC Tracking Platform of NCSD (see Figure 4).

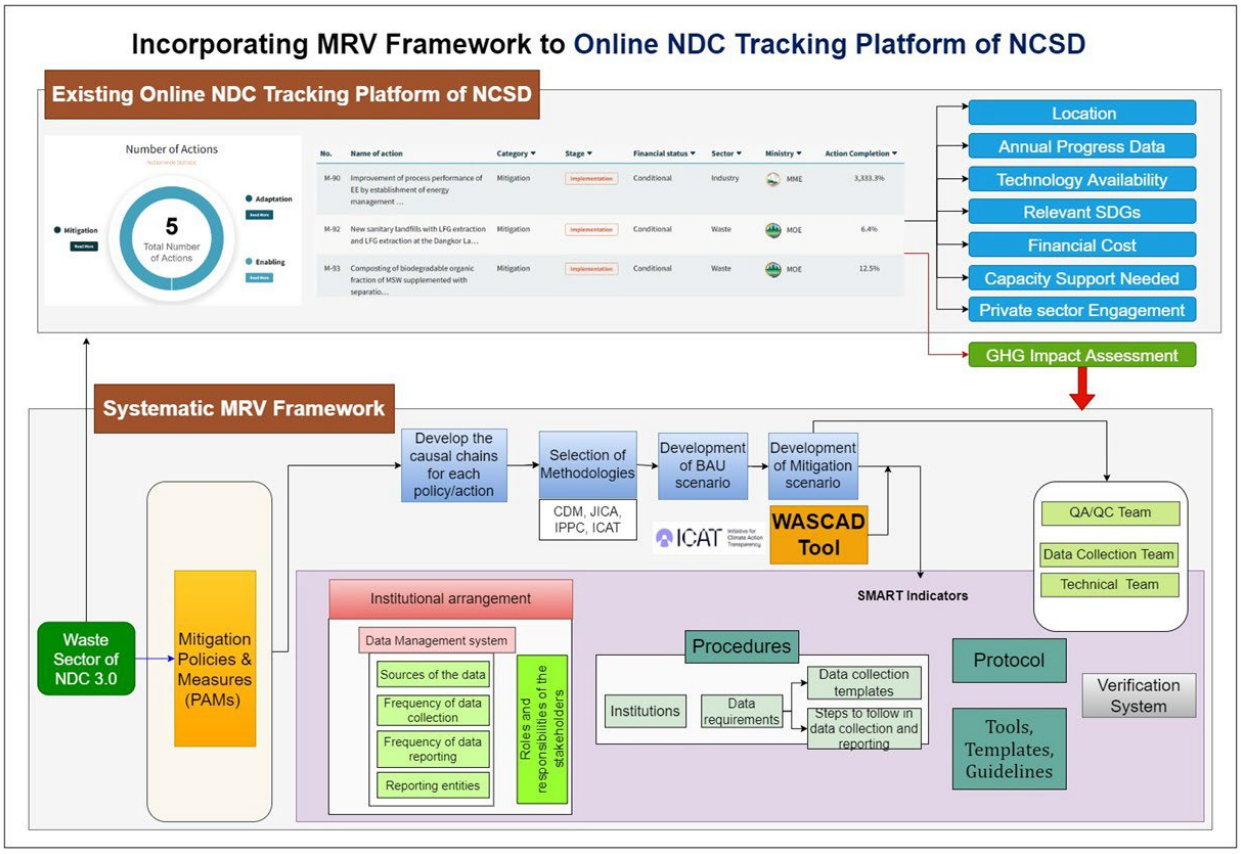

Figure 4: Incorporating the MRV framework to estimate GHG impact assessment into the online NDC tracking platform of NCSD

The systematic MRV framework includes the development of causal chains to identify potential emission reduction pathways, followed by the selection of appropriate methodologies for calculating baselines and mitigation scenarios using data from systematic institutional arrangements. Furthermore, it establishes procedures and protocols, including standardized data collection templates, data-sharing procedures across institutions, and a verification system. Dedicated teams for QA/QC, data collection, and technical work will also be assigned to ensure effective implementation.

With continued support and proper implementation of the proposed framework, Cambodia can establish a robust, transparent, and sustainable MRV system for NDC tracking in the waste sector.

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Annex I

Gaps and needs for effective compilation of the national inventory reports for the waste sector

To effectively compile a national inventory report for the waste sector, a comprehensive approach is required, including identifying key waste streams, utilizing standardized methodologies based on IPCC guidelines, implementing robust data collection systems, incorporating quality assurance/quality control (QA/QC) procedures, engaging stakeholders, and documenting all methods and data sources to ensure accuracy, transparency, and comparability of the report. Developing countries often face difficulties in collecting and verifying waste-related activity data due to fragmented waste management systems, a lack of standardized data collection protocols, and reliance on default emission factors rather than country-specific values

Gaps in data collection

Gaps in data collection in Cambodia's waste sector pose significant challenges to accurate emissions estimation. Gaps in data collection in Cambodia's waste sector stem from the lack of a structured and institutionalized system, with data gathering occurring on an ad hoc basis. The following table demonstrates several gaps and needs identified in the first biennial transparency report and the third national communication.

Gaps and needs in data collection

Gaps	Needs
Activity data for industrial solid waste, biological treatment of solid waste, open burning of waste, and domestic wastewater treatment and discharge are inconsistently available and lack continuity across the years (CMB BTR1, 2024).	Implement a proper data collection mechanism to collect all the data for the entire period.
For municipal solid waste, only the bulk waste amounts were available. Activity data for separated waste types was unavailable (CMB BTR1, 2024).	Establish a data collection mechanism to collect the amount of waste for each waste type under municipal waste.
Limited local emission factors (CMB BTR1, 2024)	Development of country-specific emission factors

Inadequate system for managing and updating national activity data for all sectors(FBUR technical analysis, n.d.)	Enhance institutional capacity by strengthening collaboration with relevant government agencies, improving data collection and management systems, and striving to enhance the completeness of data.
Lack of activity data needed to estimate indirect GHGs (NOx, NMVOCs, CO, SO_2) outside the energy sector (FBUR technical analysis, n.d.)r	Strengthen national capacity to estimate indirect GHGs (nitrogen oxides, nonmethane volatile organic compounds, carbon monoxide, sulfur dioxide) in sectors beyond energy.
Incomplete data on the implementation status and emission reductions of mitigation actions (FBUR technical analysis, n.d.)	Expand the domestic MRV system to include all the mitigation actions with regular updates from implementing entities
Limited availability of quantitative goals, progress indicators, and assumptions for modeling emission impacts (FBUR technical analysis, n.d.)	Strengthen the capacity to report the description, quantitative targets, and progress indicators for defined mitigation actions in line with UNFCCC reporting guidelines
Absence of uniform structure or reporting format for implementing entities to communicate progress on mitigation actions (FBUR technical analysis, n.d.)	Enhance the existing MRV system for mitigation actions by developing standardized reporting templates to be used by implementing entities for annual reporting, clearly reflecting all relevant BUR reporting provisions
Lack of a comprehensive system to monitor the status of all projects receiving financial support and project ideas (FBUR technical analysis, n.d.)	Improve the support MRV system to ensure effective monitoring, reporting, and verifying the status of funded projects and project ideas introduced in the Technology Needs Assessment (TNA)

Gaps in reporting mechanisms

Gaps in reporting mechanisms for Cambodia's waste sector create challenges in ensuring transparency, accuracy, and consistency in emissions estimation. The technical analysis of FBUR identifies several gaps, including the absence of an institutionalized system for compiling and managing the inventory, limited national capacity to develop the inventory, and limited financial support for inventory preparation.

Gaps and needs in reporting mechanisms

Gaps	Needs
Weak coordination for reviewing GHG inventory data and assumptions (FBUR technical analysis, n.d.)	Improve the country's ability to efficiently organize, manage, and evaluate the data and information required for compiling the Greenhouse Gas (GHG) inventory, ensuring that this process happens on schedule
Lack of procedures for continuous inventory preparation and timely review (FBUR technical analysis, n.d.)	Strengthen institutional capacity to develop a continuous inventory preparation process, including procedures and arrangements, with an emphasis on enhanced cooperation with relevant government bodies
Weak QA/QC processes for MRV reports submitted to the UNFCCC (FBUR technical analysis, n.d.)	Strengthen the domestic MRV system, with a focus on preparing reports for submission to the secretariat and enhancing quality assurance procedures.
Absence of mandatory annual reporting from Clean Development Mechanism (CDM) entities to national coordinating bodies (FBUR technical analysis, n.d.)	Improve the MRV system for international carbon market mechanisms, like the CDM, so that the organization running the project (the implementing entity) is required to report every year to the national CDM authority.

Limited capacity to prepare, review, and submit BURs continuously and accurately (FBUR technical analysis, n.d.)	Enhance national capacity to mobilize resources and prepare, review, and submit BURs continuously
Insufficient capacity to report on support received and needed, including technical and technological aspects (FBUR technical analysis, n.d.)	Enhance national capacity to report on support received and needed, including the technical and technological aspects of such support