



DEVELOPMENT OF AN MRV FRAMEWORK FOR THE WASTE SECTOR IN CAMBODIA

Report on institutional arrangements



May 2026



Initiative for Climate Action Transparency - ICAT

DEVELOPMENT OF AN MRV FRAMEWORK FOR THE WASTE SECTOR, INCLUDING
APPLICATION OF THE WASCAD AND GACMO TOOLS, CAMBODIA

Output J - Report on Institutional Arrangements

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The Royal Government of Cambodia (RGC) ratified the United Nations Framework Convention on Climate Change (UNFCCC) in 1996, and the Paris Agreement in 2017. The country submitted their Intended Nationally Determined Contribution (INDC) in 2015 and the third Nationally Determined Contribution (NDC 3.0) in August 2025 to the UNFCCC.

Cambodia has developed Monitoring, Reporting, and Verification (MRV) frameworks for several sectors, including forestry (REDD+), energy efficiency (NAMA in garments), renewable energy, and transport. However, a national MRV framework for the waste sector is still not in place. Existing systems, such as the NDC platform, do not currently enable the estimation of GHG impacts, requiring focal points to depend on external tools. Since tracking progress in the implementation and achievement of NDCs is a key requirement under the Enhanced Transparency Framework (ETF), establishing an MRV system is essential for Cambodia to achieve its targets in a standardized and transparent manner. In this context it is necessary to identify relevant indicators and assess existing data gaps to support the development of an effective and reliable MRV system for the waste sector in Cambodia.

The United Nations Office for Project Services (UNOPS) is providing technical assistance to the RGC under this ICAT project, which aims to design an MRV system for selected mitigation actions in the waste sector of Cambodia. A Team of National Experts, and International Experts of Climate Smart Initiatives (Pvt) Ltd (ClimateSI), were selected to support this project.

Appreciating the invaluable contribution extended from all stakeholders related to the assignment, we would like to extend our sincere thanks and gratitude to H.E. Sum Thy, Director General of General Directorate of Policy and Strategy (GDPS), Ministry of Environment; Mr. Sum Cheat, Deputy Director of the Department of Climate Change; and Mr. Lun Lido, Head of Office, Department of Climate Change, and other relevant key stakeholders for cooperating and assisting with this assignment by granting necessary approvals making relevant officers available for participation for the discussions, and providing necessary information.

Executive summary

This report presents institutional arrangement for the NDC tracking assessment for Cambodia's waste sector under NDC 3.0, undertaken within the framework of ICAT Phase 3. The report reviews the institutional arrangements introduced under BTR1 and finds meaningful progress toward a more structured and transparent NDC tracking framework. Roles and responsibilities are increasingly aligned with data-generating institutions at the sectoral level, including the Ministry of Rural Development, National Institute of Statistics, Ministry of Water Resources and Meteorology, Ministry of Industry, Science, Technology and Innovation, and Ministry of Agriculture, Forestry and Fisheries. At the national level, the establishment of a National NDC Tracking Compilation Team, an International NDC Tracking Evaluation Team, and a QA and Verification Team represents a significant improvement in data coordination, methodological oversight, and quality assurance. The Department of Climate Change functions as the national coordinator, ensuring alignment between NDC tracking, national GHG inventory processes, and transparency reporting.

Despite these advances, institutional gaps persist. Standardized reporting templates are not yet consistently applied across institutions and administrative levels, formal data-sharing agreements are largely absent, and QA/QC procedures are unevenly implemented, particularly at sub-national level. In addition, MRV functions remain heavily reliant on project-based technical support, with no long-term staffing plan to ensure continuity, institutional memory, and sustainability of the tracking system.

Overall, the report concludes that Cambodia has established a solid technical and institutional foundation for waste-sector NDC tracking under NDC 3.0. However, realizing the full transparency and accountability objectives of the Enhanced Transparency Framework will require sustained investment in MRV systems, institutional coordination, and operational monitoring. The recommendations set out in this report provide a practical and phased pathway to close existing gaps and enable credible tracking of waste-sector mitigation outcomes in future BTR and NDC reporting cycles.



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List of Abbreviations

ADB	Asian Development Bank
AR6	Sixth Assessment Report (IPCC)
BOD	Biochemical Oxygen Demand
BTR	Biennial Transparency Report
BTR1	First Biennial Transparency Report
CCTWG	Climate Change Technical Working Group
CH₄	Methane
CO₂	Carbon Dioxide
COD	Chemical Oxygen Demand
DCC	Department of Climate Change
DSWM	Department of Solid Waste Management
DWQM	Department of Water Quality Management
EPR	Extended Producer Responsibility
ETF	Enhanced Transparency Framework
F&B	Food and Beverage
GACMO	Greenhouse gas Abatement Cost Model
GDEP	General Directorate of Environmental Protection
GDPS	General Directorate of Policy and Strategy
GFT	Garment, Footwear and Travel goods
GGGI	Global Green Growth Institute
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation)
ICAT	Initiative for Climate Action Transparency
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IWW	Industrial Wastewater



LFG	Landfill Gas
MAFF	Ministry of Agriculture, Forestry and Fisheries
MBT	Mechanical-Biological Treatment
MISTI	Ministry of Industry, Science, Technology and Innovation
MME	Ministry of Mines and Energy
MoE	Ministry of Environment
MoU	Memorandum of Understanding
MWRAM	Ministry of Water Resources and Meteorology
MPGs	Modalities, Procedures and Guidelines
MRD	Ministry of Rural Development
MRV	Measurement, Reporting and Verification
MSW	Municipal Solid Waste
NAMA	Nationally Appropriate Mitigation Action
NC	National Communication
NCSD	National Council for Sustainable Development
NDC	Nationally Determined Contribution
NIS	National Institute of Statistics
PDoE	Provincial Department of Environment
PITW	Post-Industrial Textile Waste
PPWMA	Phnom Penh Waste Management Authority
QA	Quality Assurance
QA/QC	Quality Assurance / Quality Control
QC	Quality Control
RDF	Refuse-Derived Fuel
REDD+	Reducing Emissions from Deforestation and Forest Degradation
RGC	Royal Government of Cambodia
SNA	Sub-National Administration
SOP	Standard Operating Procedure
SUP	Single-Use Plastic
SWDS	Solid Waste Disposal Sites



SWM	Solid Waste Management
UNFCCC	United Nations Framework Convention on Climate Change
UNOPS	United Nations Office for Project Services
WasCAD	Waste Sector Climate Action Data tool
WtE	Waste-to-Energy

I. INTRODUCTION

1.1. Background

The waste sector is one of the fastest-growing contributors to Cambodia's greenhouse gas emissions, accounting for a significant share due to rapid urbanization, increasing waste generation, and gaps in existing waste management systems. Compared to other sectors like energy and agriculture, the waste sector presents unique opportunities for mitigation through integrated waste management strategies, such as composting, landfill gas recovery, and improved wastewater treatment.

Cambodia's Nationally Determined Contribution (NDC) establishes mitigation commitments across key sectors, including waste, to support the country's transition toward a low-emissions and climate-resilient development pathway. The waste sector, encompassing solid waste, wastewater, and open burning, represents a growing share of national greenhouse gas (GHG) emissions, primarily due to rapid urbanization, increasing consumption, and gaps in waste management, treatment, and disposal systems. Strengthening monitoring, reporting, and verification (MRV) arrangements in this sector is therefore essential to track progress toward Cambodia's NDC targets, inform policy adjustments, and enhance transparency under the Enhanced Transparency Framework (ETF) of the Paris Agreement.

Decision 18/CMA.1 provides specific modalities, procedures, and guidelines (MPGs) for reporting information necessary to track progress made in implementing and achieving NDCs. These MPGs require developing country Parties to identify indicators, establish data collection systems, report methodologies, and document progress over time. The Initiative for Climate Action Transparency (ICAT) guidelines provide a complementary, practical framework for designing indicator systems, assessing policy impacts, and strengthening institutional arrangements for transparency. Within this context, this report presents a structured approach for institutional arrangement in Cambodia's waste sector.



1.2. Objective

The purpose of this report is to propose an institutional arrangement for monitoring the implementation and achievement of Cambodia's NDC 3.0 targets in the waste sector. This includes Mapping institutional arrangements, stakeholder roles, and existing reporting pathways for data collection.

This report constitutes **Output J** under Activity 5 of the ICAT-supported assessment and will serve as a key technical input for strengthening the waste sector MRV system of Cambodia.

1.3. Scope

This assessment covers all major waste-sector emission sources, mitigation actions, and enabling systems relevant to Cambodia's NDC 3.0 and consistent with the scope of the ICAT Phase 3 project on the development of an MRV framework for the waste-sector. The scope encompasses both emission-generating activities and mitigation interventions across the waste management value chain, including upstream waste prevention and reduction, downstream treatment and disposal processes, and cross-cutting institutional arrangement and data management systems required to support MRV, projections, and tracking the NDC implementation.

II. CAMBODIA'S NDC TARGET & TRACKING NEEDS FOR WASTE SECTOR

2.1. Overview of NDC Targets for the Waste Sector

Cambodia's NDC 3.0 outlines an integrated waste sector strategy aimed at reducing municipal solid waste (MSW) generation, enhancing resource recovery, and improving waste treatment systems to support long-term climate mitigation. The country targets 50% source segregation of MSW, 75% household access to regular waste collection, and a reduction of open burning to 10% by 2035. Organic waste processing capacity is planned to expand to 600,000 tons per year, equivalent to approximately 25% of total MSW, through the establishment of municipal and regional composting facilities, community-based composting, and increased participation of farmers in organic waste utilization.

To extend landfill lifespan and reduce methane generation, the NDC introduces large-scale Refuse-Derived Fuel (RDF) production and waste-to-energy (WtE) development, to decrease

landfill MSW disposal by 30% by 2035. Medical waste management will also be strengthened, targeting a capacity of 8 tons per day. Landfill operations will be upgraded through a 50% increase in controlled and sanitary landfills. The Toul Prech regional landfill is expected to integrate landfill gas (LFG) extraction by 2027.

The NDC additionally prioritizes plastic and textile waste reduction, including nationwide recycling programs, public awareness initiatives, centralized textile sorting centres, and factory-level waste minimization supported by incentives. In the wastewater subsector, Cambodia aims to achieve 100% industrial wastewater treatment coverage for Garment, Footwear, and Travel goods (GFT) and leather factories, alongside doubling the number of biogas-producing treatment plants¹.

To operationalize Cambodia's waste-sector NDC targets, the following specific mitigation measures were outlined in NDC 3.0:

- Implement solid waste reduction strategies and pollution control measures;
- Waste collection and segregation at source (at households, schools, markets, restaurants/hotels levels);
- Increase capacities for organic waste processing;
- Introduce alternative SWM processing at existing landfills;
- Landfill management;
- Improve textile waste management capacities; and
- Industrial wastewater (IWW) management.

III. INSTITUTIONAL ARRANGEMENTS FOR DATA COLLECTION

3.1. Current Institutional Setup

The current institutional arrangement for NDC tracking in the waste sector is primarily anchored in the sector lead agency, the Ministry of Environment, with technical and implementation support from the Ministry of Industry, Science, Technology and Innovation and the Phnom Penh Municipality. While this institutional arrangement was identified in the

¹ Cambodia NDC 3.0



First Biennial Transparency Report (BTR1) as the basis for tracking NDC implementation in the waste sector, recent developments associated with the preparation of NDC 3.0 indicate that the arrangement requires updating. Accordingly, revisions to the institutional setup are reflected in section 3.6 to ensure alignment with the current national context and enhanced NDC tracking requirements.

NDC reporting in Waste Sector in Cambodia is structured by multiple stakeholders, consisting of national ministries, subnational authorities and private operators. The national management of waste sector was designed to facilitate data collection, validation, and reporting to meet international transparency requirements under the Paris Agreement's ETF.

Following figure illustrates the proposed institutional arrangements of the Waste sector for NDC progress tracking in BTR1.

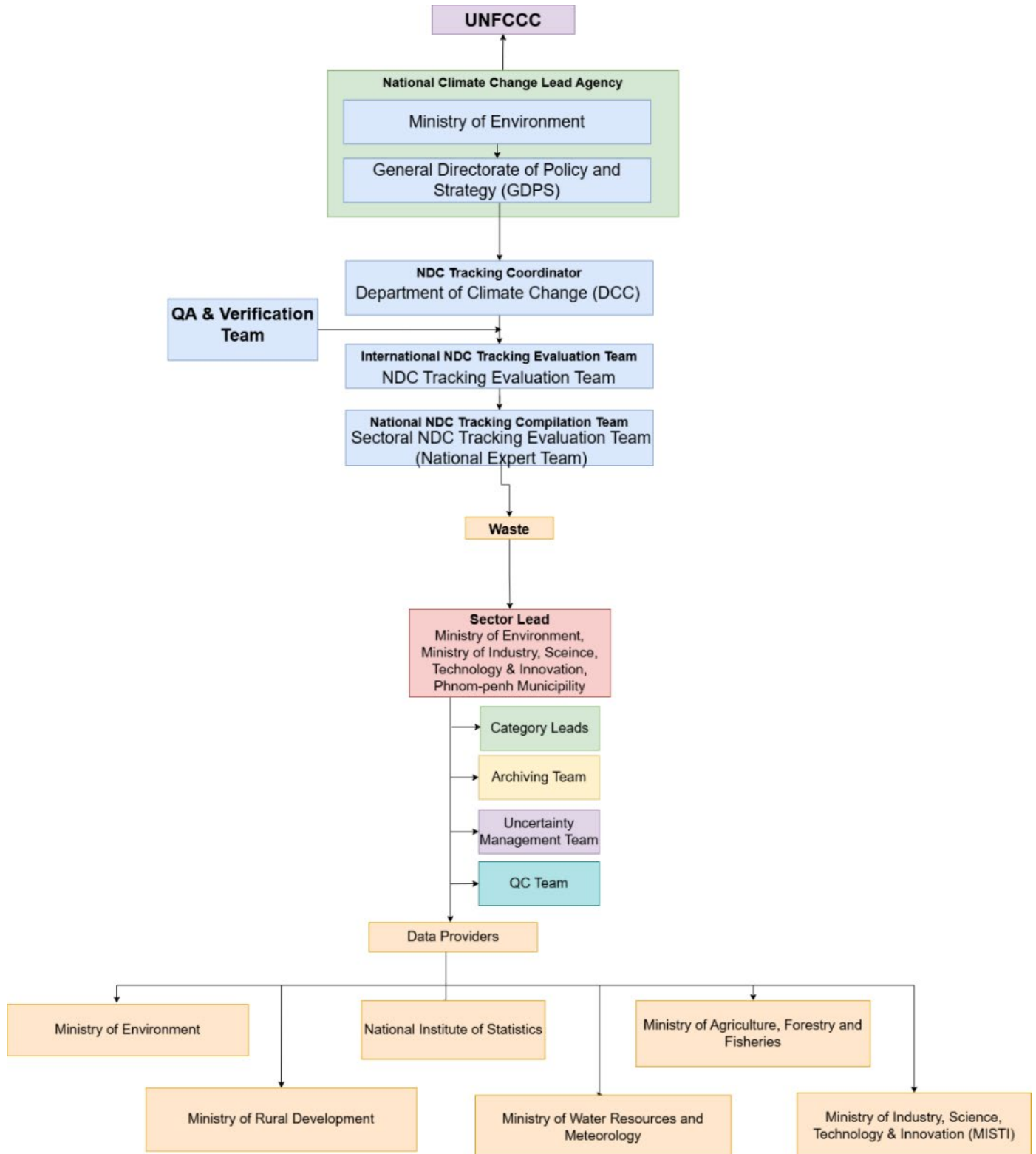


Figure 1: The proposed institutional arrangements of the Waste sector for NDC progress tracking, as outlined in BTR 1

3.2. National and Sub-national Coordination

At the national level, the Ministry of Environment (MoE) serves as the lead entity responsible for data compilation, national GHG inventory documentation, and overall MRV activities. Within the MoE, specific teams handle inventory and MRV tasks, often collaborating with the Department of Climate Change (DCC), which is the national coordinator for climate related reporting. The Ministry of Mines and Energy (MME) also plays a critical role in providing energy statistics and grid emission factors required for waste-to-energy plants.

The operational implementation and primary data gathering often occur at the sub-national level. Sub National Administrations (SNAs) and Provincial Departments of Environment (PDoEs) are the key actors in monitoring local waste management activities. Specifically, the Phnom Penh Waste Management Authority (PPWMA), is a significant institutional body managing waste in the capital city.

The workflow illustrates Cambodia's institutional architecture for NDC tracking, structured to ensure compliance with the Enhanced Transparency Framework under the UNFCCC. At the apex, the national climate change lead agency is the Ministry of Environment, operating through the General Directorate of Policy and Strategy (GDPS), which provides overall policy oversight, strategic direction, and formal reporting linkage to the UNFCCC. Within this structure, the DCC serves as the national NDC Tracking Coordinator, translating policy mandates into operational tracking guidance, consolidating sectoral inputs, and ensuring alignment between national inventory systems, mitigation actions, and reporting requirements. An independent QA and Verification Team operates alongside this core structure to safeguard transparency, consistency, and credibility across the tracking process.

Below the coordination level, the workflow distinguishes between evaluation, compilation, and sectoral implementation functions. An International NDC Tracking Evaluation Team provides technical backstopping, methodological review, and alignment with international good practice, particularly for MRV design and indicator robustness. In parallel, the National NDC Tracking Compilation Team—comprising of sectoral national experts—aggregates data, applies agreed methodologies, manages assumptions, and prepares sector-level



tracking outputs. For the waste sector specifically, this compilation function translates national mitigation targets into measurable indicators, tracks progress against baselines, and documents uncertainties. This layered evaluation–compilation structure ensures that NDC tracking is not only nationally owned but also technically defensible and externally credible.

At the sectoral and data generation level, the waste sector is led jointly by the Ministry of Environment, the Ministry of Industry, Science, Technology and Innovation, and Phnom Penh Municipality, reflecting the cross-cutting nature of waste management across policy, regulation, and service delivery. Under the sector lead, specialized teams are assigned clear technical roles: category leads coordinate sub-sector data (solid waste, wastewater, treatment technologies), the archiving team ensures data traceability and documentation, the uncertainty management team assesses data limitations and methodological uncertainty, and the QC team conducts internal consistency checks before submission. Primary data providers include line ministries and institutions such as the National Institute of Statistics, the Ministry of Agriculture, Forestry and Fisheries, the Ministry of Rural Development, the Ministry of Water Resources and Meteorology, and MISTI, which supply activity data, operational statistics, and administrative records. Data flows upward from these providers through sectoral structures to the national coordination level, where they are validated, compiled, and ultimately reported as part of Cambodia’s NDC tracking and transparency obligations.

3.3. Private Operators and Partners

Private waste management companies are integral to the current implementation of data collection on the waste sector. They are responsible for primary data collection at the waste disposal sites for recycling mechanisms. CINTRI, GAEA, Mizuda Sanitation Cambodia Co. Ltd, CSARO, and Chip Mong Eco-cycle, are required to report data on waste collection, generation, treatment and disposal as part of their licensing agreements. Their information is intended to be integrated into a centralized platform to provide a comprehensive view of the waste management and further action plan.



Furthermore, several international development partners including GIZ, UNDP, GGGI, the World Bank and ADB support the institutional framework by providing technical assistance, funding and capacity building to improve data collection systems and align with international standards.

3.4. Roles and Responsibilities

The proposed institutional arrangement outlined in Cambodia's BTR1 represents a deliberate shift toward a more structured, role-based system for managing sectoral data and strengthening transparency in NDC tracking. At the sectoral level, responsibilities are explicitly assigned to institutions that generate or manage primary activity data relevant to the waste sector. These include the Ministry of Rural Development, the National Institute of Statistics, the Ministry of Water Resources and Meteorology, the Ministry of Industry, Science, Technology and Innovation, and the Ministry of Agriculture, Forestry and Fisheries. Each institution contributes data within its legal mandate, including rural sanitation and waste service coverage, population and household statistics, hydrological and discharge context, industrial wastewater volumes and permitting information, and agricultural or agro-processing organic waste streams. Together, these datasets form the empirical foundation for tracking waste-sector mitigation actions under NDC 3.0. [Click or tap here to enter text.](#)

At the national level, BTR1 introduces a clearer separation of coordination, compilation, and evaluation functions to enhance data integrity and methodological consistency. A National NDC Tracking Compilation Team has been established to systematically collect activity data from sectoral institutions, support emissions and mitigation calculations, and apply quality assurance checks in line with the national QA/QC plan. This team operates under the coordination of the Department of Climate Change, which serves as the national focal point for NDC tracking and ensures consistency with national GHG inventory systems, national communications, biennial transparency reporting, and NDC 3.0 tracking requirements. To reinforce technical credibility and alignment with international good practice, an International NDC Tracking Evaluation Team independently reviews compiled datasets, methodologies, assumptions, and uncertainty treatment.

To further strengthen accuracy, transparency, and completeness, a dedicated QA and Verification Team is embedded within the institutional arrangement to validate compiled data prior to submission to the Department of Climate Change. In parallel, private waste management operators are required to report operational data on waste collection, treatment, recycling, and disposal as part of their environmental licensing and permitting obligations. This reporting requirement enables integration of private-sector operations into the centralized NDC tracking framework, reduces reliance on project-based or ad hoc data sources, and improves coverage of waste-sector activities. Collectively, these roles and responsibilities establish a coherent institutional chain from data generation and validation to national compilation and reporting, consistent with BTR1, NDC 3.0, and Cambodia's broader transparency obligations under the Enhanced Transparency Framework.

To enhance the credibility of verification outputs, the QA and Verification Team will, where feasible, include at least one external technical reviewer (for example, from a national academic institution or research centre) and may invite a development-partner representative as an observer. The team's review findings, including methodological observations and recommendations for improvement, will be documented and shared with the National NDC Tracking Compilation Team and the Department of Climate Change, consistent with ETF expectations for transparency and external scrutiny.

Table 1: Summary of Roles and Responsibilities for Waste Sector NDC Tracking

Institution / Team	Primary Role in NDC Tracking	Key Data Provided	Data Use in NDC Tracking
Ministry of Rural Development (MRD)	Generation and reporting of rural sanitation and decentralized waste service data	Rural waste collection coverage, on-site sanitation systems, sludge management practices	Activity data for rural solid waste and domestic wastewater components; scaling of national estimates
National Institute of Statistics (NIS)	National statistical authority and cross-sector data harmonization	Population statistics, household surveys, waste generation proxies, urban–rural splits	Baseline scaling, consistency checks, extrapolation of waste quantities

Institution / Team	Primary Role in NDC Tracking	Key Data Provided	Data Use in NDC Tracking
Ministry of Water Resources and Meteorology (MoWRAM)	Provision of hydrological and water resource context	River flows, water availability, discharge points, climatic data	Validation and contextualization of wastewater generation and discharge estimates
Ministry of Industry, Science, Technology and Innovation (MISTI)	Regulation and oversight of industrial facilities and industrial wastewater	Industrial wastewater volumes, permits, treatment status, industrial activity data	Tracking of industrial wastewater (IWW) mitigation actions and treatment coverage
Ministry of Agriculture, Forestry and Fisheries (MAFF)	Management of agricultural and agro-processing waste streams	Organic waste from agro-processing, crop residues, livestock-related waste	Estimation of organic waste diversion and biological treatment potential
National NDC Tracking Compilation Team	Aggregation, calculation, and consolidation of sectoral data	Compiled activity data, mitigation indicators, assumptions	Estimation of emissions and mitigation outcomes; preparation of sector tracking outputs
International NDC Tracking Evaluation Team	Independent technical and methodological review	Reviewed datasets, methodologies, assumptions	Validation of methodological alignment with IPCC and ETF requirements
QA and Verification Team	Quality assurance, consistency checks, and verification	Verified datasets, QA/QC logs, review findings	Ensuring transparency, completeness, and readiness for submission
Private waste management operators	Operational data generation under licensing and contracts	Waste collection volumes, treatment capacity, disposal methods, recycling data	Improving completeness and accuracy of waste-sector activity data

Private waste management operators will be required to report data on waste collection, treatment, and disposal as part of their licensing agreements. This data will be integrated into the centralized platform to provide a complete picture of waste-sector activities.



3.5. Gaps in Institutional Arrangements

Despite the strengthened institutional framework introduced under BTR1, significant gaps remain that constrain effective MRV implementation for the waste sector. Institutional mandates related to waste and wastewater data remain fragmented across multiple ministries and agencies, with overlapping responsibilities and limited clarity on data ownership for NDC tracking purposes. While the Ministry of Environment is responsible for national MRV coordination and GHG inventory compilation, key datasets, particularly for industrial wastewater and treatment performance are generated and held by other institutions, including MISTI, the Department of Water Quality Management, industrial zone authorities, and private operators. In the absence of formalized data-sharing mechanisms, data transfer remains irregular and largely dependent on project-based arrangements.

A critical operational gap is the lack of standardized reporting templates and harmonized data definitions across institutions and administrative levels. Data are often reported in inconsistent formats, timeframes, and units, limiting their usability for national aggregation and trend analysis. QA/QC procedures, while defined at the national level, are not yet systematically applied across sectoral and sub-national data providers, resulting in uneven data quality. At the sub-national level, limited technical capacity and resources further weaken consistency, particularly for solid waste management data and wastewater monitoring, where routine measurement systems are still underdeveloped.

To address these gaps, several steps have been initiated, including the identification of core data providers under BTR1 and the conceptual design of a centralized data platform. However, additional actions are required to institutionalize these improvements. These include the development and mandatory use of standardized reporting templates, the establishment of formal memoranda of understanding or legal instruments to govern data sharing, and the expansion of QA/QC procedures to facility and sub-national levels. Furthermore, the absence of a long-term MRV staffing plan poses a structural risk to continuity and institutional memory, underscoring the need to embed MRV functions within permanent government structures rather than relying on short-term project support.



These gaps reinforce the need for an agreed coordination mechanism and role clarity among MoE departments, sub-national administrations, operators, and line ministries—an objective already emphasized through the inception-phase stakeholder platform.

Inter-ministerial coordination for waste-sector NDC tracking operates under the existing National Council for Sustainable Development (NCSd) framework, with the Climate Change Technical Working Group (CCTWG) providing technical guidance and the Department of Climate Change serving as secretariat for day-to-day coordination. Through this arrangement, MoE, MISTI, MAFF, MRD, MoWRAM, MME, NIS and Phnom Penh Municipality engage on data-related matters using established channels, avoiding the need for parallel coordination structures. This anchoring in statutory bodies with established mandates strengthens the long-term sustainability of the coordination function across NDC and BTR reporting cycles.

1. **Unclear routine data submission chain for landfill operators:** Although MoE leads national inventory/MRV, routine site-level reporting obligations for landfill operators are not consistently defined or enforced (e.g., annual waste tonnage, site operation parameters, flare logs).
2. **Fragmentation between national and sub-national roles:** Municipalities/provinces and service operators hold key operational data, but these are not systematically transferred to MoE through a standardized template and schedule. This creates discontinuities between service delivery records and national MRV needs.
3. **No standardized MRV protocol for LFG systems:** For LFG capture, the absence of national protocols for instrument calibration, minimum data fields (flow, CH₄%, uptime), and QA/QC procedures will delay credible methane accounting even after infrastructure is installed.
4. **Limited coordination mechanism across line ministries for cross-cutting parameters:** Waste MRV requires parameters such as grid emission factors and T&D losses (energy institutions), industrial energy/heat use (MME/industry), and

statistics (NIS). Coordination mechanisms and data-sharing arrangements are not yet formalized for routine annual updates.

Table 2: Summary of Institutional Gaps and Required Actions

Gap Area	Current Situation	Impact on NDC Tracking	Actions Required
Reporting templates	No unified templates across institutions	Inconsistent and non-comparable data	Develop and mandate standardized templates
Data-sharing mechanisms	No formal MoUs or legal instruments	Irregular data transfer	Establish formal data-sharing agreements
QA/QC implementation	Defined but unevenly applied	Variable data quality	Extend QA/QC to sub-national and facilities
Institutional coordination	Overlapping mandates	Duplication and data gaps	Clarify roles through formal mandates
Sub-national capacity	Limited technical expertise	Weak data consistency	Systematic capacity-building programs
MRV staffing	Project-based reliance	Risk to continuity	Establish permanent MRV units

No long-term MRV staffing plan

Institutional arrangements for waste sector MRV are characterized by overlapping mandates and unclear data-sharing mechanisms. While MoE is responsible for national MRV and GHG inventory compilation, key wastewater data are generated and managed by other institutions, notably MISTI, the Department of Water Quality Management, industrial zone authorities, and private operators. There is no formalized mechanism or legal instrument to ensure routine data transfer, validation, and aggregation for NDC tracking purposes. At the sub-national level, capacity constraints and limited technical expertise further weaken data consistency, particularly for solid waste management and wastewater monitoring. These gaps highlight the need for clearer role definitions, formal MoUs, and strengthened coordination platforms.

3.6. Proposed institutional arrangement

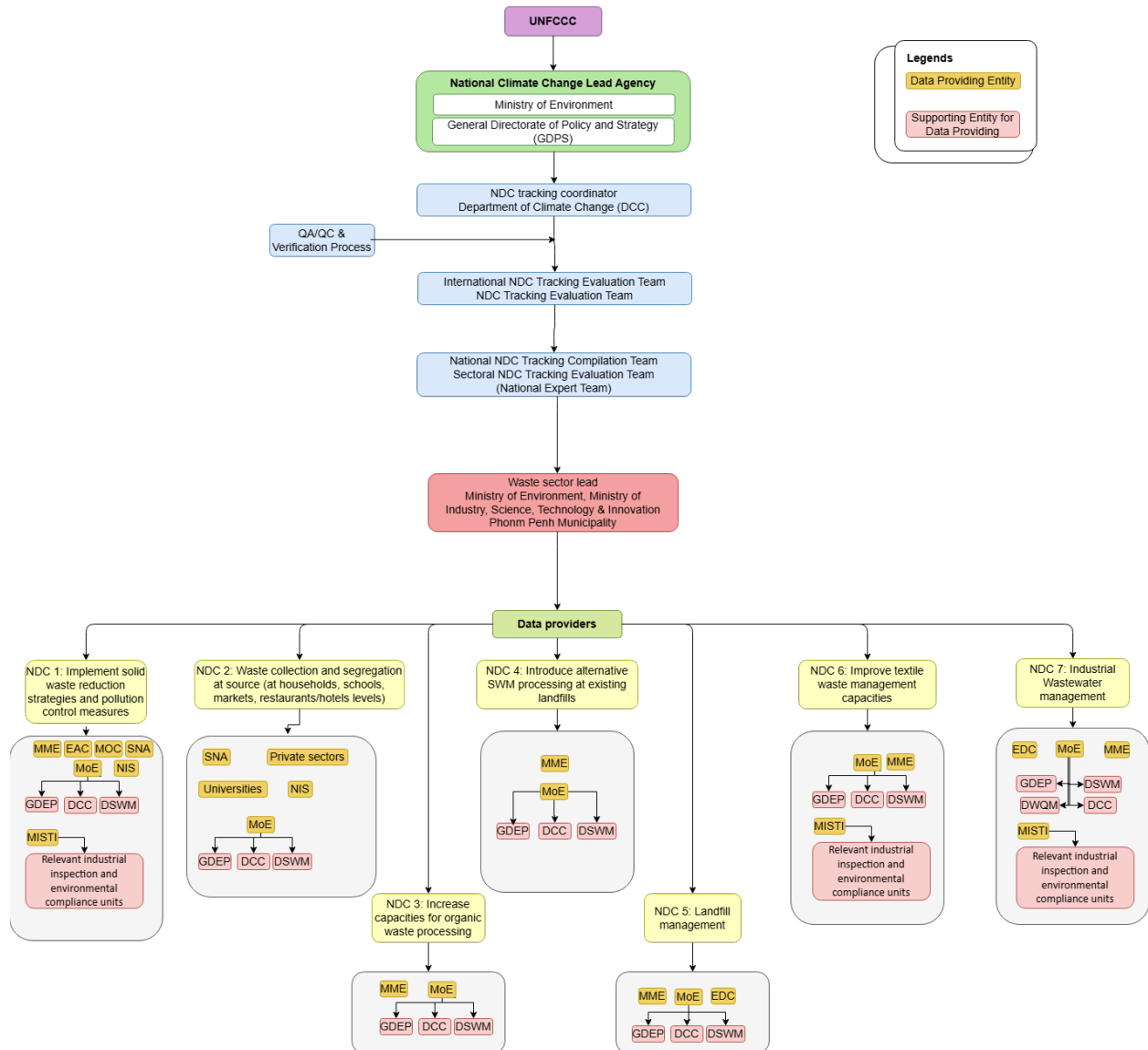
This section presents the proposed institutional arrangements for waste sector NDC progress tracking of NDC measures under Cambodia's NDC 3.0, structured explicitly around the roles and data flows of identified data providers. As illustrated in Figure 1, the institutional architecture is anchored at the national level by the Ministry of Environment, acting as the National Climate Change Lead Agency through the General Directorate of Policy and Strategy. This level holds overall policy authority, ensures alignment with national climate commitments, and serves as the formal interface with the UNFCCC. The Department of Climate Change functions as the NDC tracking coordinator, responsible for operationalizing NDC targets into trackable indicators, coordinating sectoral inputs, and ensuring coherence between mitigation implementation, national GHG inventory processes, and transparency reporting requirements. A QA and Verification Team is positioned alongside this coordination function to independently review data consistency, methodological application, and documentation quality before results are finalized.

The proposed arrangement distinguishes clearly between evaluation, compilation, and sectoral data generation to reflect the realities of Cambodia's waste data landscape. An International NDC Tracking Evaluation Team provides methodological oversight, alignment with international MRV good practice, and independent technical review of assumptions and uncertainty treatment. In parallel, the National NDC Tracking Compilation Team—comprising of national sector experts—aggregates data received from sectoral and institutional sources, applies agreed methodologies, and consolidates progress across all waste-related NDC measures. This separation ensures that national ownership of data and results is maintained, while technical robustness and credibility are reinforced through structured review. For the waste sector, this compilation role is critical to translating diverse data inputs into coherent tracking outputs across solid waste management, organic waste processing, landfill management, textile waste, and industrial wastewater actions.

Figure 2 reflects a data-provider-driven model at the operational level in which sector leadership and technical functions are closely linked to institutions responsible for implementation and data generation. The waste sector is led jointly by the Ministry of



Environment, the Ministry of Industry, Science, Technology and Innovation, and Phnom Penh Municipality, recognizing the cross-cutting governance of waste across policy, regulation, and service delivery. Under the sector lead, category leads coordinate specific NDC actions, while dedicated teams manage archiving, uncertainty assessment, and quality control. Primary data providers—including line ministries, the National Institute of Statistics, sub-national authorities, private sector operators, universities, and development partners—supply activity data, operational statistics, and project-level information relevant to each NDC action. Data flow upward through this structured pathway to the national coordination level, enabling systematic compilation, review, and reporting of waste sector NDC progress. This proposed arrangement is designed to strengthen institutional clarity, improve data traceability, and progressively transition Cambodia’s waste sector NDC tracking from estimation-based reporting toward a more robust, implementation-focused MRV system. The Department of Climate Change serves as the operational owner of the WasCAD platform, responsible for system administration, user-access governance, and data validation workflows, with technical support arrangements as appropriate. Standard Operating Procedures (SOPs) for WasCAD data entry, validation, and archiving will be documented separately and updated as the system matures.



Note: GDEP: General Directorate of Environmental Protection, DCC: Department of Climate Change, DSWM: Department of Solid Waste Management, DWQM: Department of Water Quality Management

Figure 2: The proposed institutional arrangements of the Waste sector NDC progress tracking of NDC measures in NDC 3.0

IV. RECOMMENDATIONS AND NEXT STEPS

To strengthen waste-sector MRV for NDC tracking, it is recommended to standardize data collection using ICAT-aligned templates covering both wastewater and solid waste, and to digitize data flows through an integrated national platform linked to WasCAD. Regular capacity-building and technical training should be provided to line ministries, sub-national authorities, and facility operators, with a particular focus on wastewater monitoring parameters relevant to GHG estimation. Institutional arrangements should be reinforced through formal data-sharing agreements, clearer mandates for QA/QC, and the establishment of a regular annual reporting cycle for NDC indicators. As a next step, pilot implementation of the MRV framework in selected wastewater and solid waste facilities can help test data collection procedures, refine methodologies, and progressively scale up national coverage.

4.1. Recommendations for Improving institutional arrangement

To strengthen the institutional arrangement with sustainable MRV system that satisfies the ETF under the Paris Agreement, Cambodia need to move forward to from ad-hoc data collection. There are several recommendations to structure a practical phase approach suitable for the Cambodia context.

Formalization structure of Data Sharing Mechanisms and Legal Mandates

Currently, the data collection pass through the informal mechanism, project-based coordination, personal data sharing results in fragmented data loops. The structure of formalized administration management will be required to ensure a reliable data, role and responsibility of each relevant institution framework to routine upward data flow.

- Developing Inter-ministerial Memorandum of Understanding (MoU): The Ministry of Environment plays a significant role to establish this MoU to strengthen the formal data sharing with core line ministries. These MoUs require to define clearly about role and responsibility, time frame require to submit the data, format and annual timeline shall be explicit.
- Strengthen and Improving the Environmental Licensing Obligations: Leverage existing MoE and MISTI industrial regulatory frameworks, relevant governance; and

private waste concessional such as CINTRI, GAEA and factory operator must be legally required to submit standardized waste amount, waste tonnage, treatment volumes and recycling metrics as a condition for annual license renewals.

- Assign the Sectoral Data Focal Points: Each primary data providing institution officially designate a permanent technical officer to serve as the MRV focal point by embedding responsibility into their roles in legal job descriptions.

Structuring Sustainability and Long-Term Capacity Building

There are some challenges regarding institutional capacity in the data collection flow. Currently, each ministry structures the data collection due to over reliance on the technical assistance from international and short-term consultants, that's unsustainable approaches. There is some recommendation to strengthen capacity as well:

- Establishing a central/national permanent waste sector MRV Unit: the civil staffs waste MRV unit shall be established in the Department of Climate Change and Lead by the General Directorate of Policy and Strategy of Ministry of Environment to be a central of the data collection and technical unit to support in the whole process.
- Institutional training programs: The contribution from partner with national-international universities, development partners such as ICAT, GGGI, UNDP, GIZ, etc. shall support in the technical capacity building to all relevant organization support in the process. That should be including IPCC guideline, WasCAD and GACMO tool into the mechanism methodology.
- Integrate sub-national administrations into national system: Providing the continue capacity building support to Phnom Penh Waste Management Authority and Provincial Department of Environment and others organisation to enforce their passive entities into active capable in front data verifier.