MRV Guidance Document

Water Sector

Initiative for Climate Action Transparency - ICAT

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Executive Summary

The Guidance Document for the Water Sector Adaptation Reporting Template provides a comprehensive manual for stakeholders tasked with data entry, analysis, and reporting within Eswatini's climate adaptation framework. Developed as part of the Initiative for Climate Action Transparency (ICAT), it ensures clarity, consistency, and alignment in the use of the reporting template to track progress on Nationally Determined Contributions (NDCs) in the water sector.

Purpose and Importance

The guidance document simplifies the often-complex reporting processes associated with climate adaptation by offering explicit instructions and examples. It serves as a critical resource to:

- Enhance Reporting Consistency: Provides step-by-step instructions on completing the template, reducing ambiguities and promoting standardized practices across stakeholders.
- Ensure Data Reliability: Offers guidance on entering accurate and verifiable data, using pre-defined metrics and indicators aligned with Eswatini's national policies and international obligations.
- Facilitate Stakeholder Collaboration: Outlines roles and responsibilities for various stakeholders, fostering seamless coordination and teamwork.

Key Features of the Guidance Document

1. Template Navigation and Use:
    - Describes how to use the content sheet for efficient navigation between sections.
    - Explains the purpose of each template sheet, including data input fields, auto-calculated fields, and locked sections to preserve data integrity.
2. Detailed Instructions for Data Entry:
    - Offers guidance on completing specific sections, such as baseline and target values, indicators, and metrics for NDC measures.
    - Highlights color-coded sections in the template to direct user input and prevent errors.
3. Standardized Calculations:
    - Provides formulas for calculating indices like the Water Quality Index (WQI) and Water Governance Index, ensuring uniformity in methodology.
    - Includes pre-defined weights and parameters for calculations, based on established literature and expert inputs.

4. Responsibilities and Collaboration:
    - Clarifies roles for data collection teams, reporting organizations, and supporting committees.
    - Encourages stakeholder engagement through a contact list and collaboration guidelines.
5. Examples and Context:
    - Offers practical examples to illustrate correct data entry and use of template features, such as progress tracking and indicator updates.
    - Suggests comments for fields where users can document challenges, assumptions, or key insights.
6. Reporting Timelines and Submission Protocols:
    - Defines timelines for data submission, review, and report consolidation to ensure timely updates for stakeholders.
    - Specifies submission formats, including electronic and hard copy requirements, ensuring all data entries are traceable and properly archived.

Role in Supporting Adaptation Efforts

This guidance document is a cornerstone for operationalizing Eswatini's water sector adaptation framework. It supports:

- Alignment with National and International Policies: Ensures that all data submitted reflects Eswatini's National Climate Change Policy (2016), Water Policy (2019), and international reporting obligations under the Paris Agreement.
- Capacity Building: Provides training materials and methodologies for stakeholders, promoting skill development in data collection and analysis.
- Stakeholder Empowerment: Equips local and national entities with tools to effectively monitor, report, and verify progress on adaptation actions.

Conclusion

The Guidance Document is essential for ensuring that the Water Sector Adaptation Reporting Template is used efficiently and effectively. By addressing common reporting challenges and providing clear, actionable instructions, it empowers stakeholders to contribute meaningful, high-quality data to Eswatini's climate adaptation efforts, fostering transparency and collaboration at all levels.

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Abbreviations

AMR – Antimicrobial Resistance

CSO – Central Statistics Office

DWA – Department of Water Affairs

ETF – Enhanced Transparency Framework

EWSC – Eswatini Water Services Corporation

GIS – Geographic Information Systems

ICAT – Initiative for Climate Action Transparency

JRBA – Joint River Basin Authority

MNRE – Ministry of Natural Resources and Energy

MoA – Ministry of Agriculture

MoF – Ministry of Finance

MoH – Ministry of Health

MoPWT – Ministry of Public Works and Transport

MTAD – Ministry of Tinkhundla Administration and Development

MRV – Monitoring, Reporting, and Verification

NCCC – National Climate Change Committee

NDC – Nationally Determined Contribution

NDMA – National Disaster Management Agency

NGO – Non-Governmental Organization

UNFCCC – United Nations Framework Convention on Climate Change

UNESWA – University of Eswatini

WASH – Water, Sanitation, and Hygiene

WQI – Water Quality Index

Key Definitions

Adaptation: - Actions or processes aimed at reducing the vulnerability of systems, communities, and resources to the adverse impacts of climate change.

Baseline: - Initial values or conditions against which progress in adaptation measures is measured. These provide reference points for assessing change over time.

Indicator: - A measurable variable used to evaluate the effectiveness, progress, or impact of adaptation actions within the water sector. Examples include water quality parameters or infrastructure resilience metrics.

Metric: - A quantitative measure used to track and assess specific aspects of adaptation interventions, such as water availability in liters per capita per day or reduction in pollutant levels.

Monitoring: - The systematic collection and analysis of data to track progress toward defined adaptation objectives and ensure alignment with planned interventions.

Nationally Determined Contributions (NDCs): - Commitments made by countries under the Paris Agreement to mitigate climate change and adapt to its impacts. For Eswatini, NDCs include sector-specific actions such as improving water governance and enhancing infrastructure resilience.

MRV Framework: - A structured approach to Monitoring, Reporting, and Verification of adaptation actions, aimed at ensuring transparency, accountability, and consistency in tracking progress.

Resilience: - The ability of systems, communities, or infrastructure to anticipate, prepare for, respond to, and recover from climate-related stresses and shocks.

Reporting Template: - A standardized tool for collecting, organizing, and submitting data on water sector adaptation measures, designed to ensure consistent and verifiable reporting practices.

Stakeholders: - Individuals, groups, or organizations with a role or interest in the planning, implementation, or monitoring of water sector adaptation actions. This includes government agencies, local communities, civil society, and international partners.

Verification: - The process of independently assessing the accuracy, reliability, and validity of reported data to ensure that it reflects the true status of adaptation efforts.

Water Quality Index (WQI): A composite measure used to evaluate and compare the quality of water based on multiple parameters, such as pH, dissolved oxygen, and chemical contaminants.

Water Governance: The institutional, policy, and management frameworks that guide the allocation, use, and protection of water resources.

Water Infrastructure Resilience: - The capacity of water-related infrastructure, such as pipelines, dams, and treatment plants, to withstand and adapt to climate impacts, including droughts and floods

1. Introduction

1.1 Purpose of the Guidance Document

This guidance document is designed to provide a comprehensive support to officers or teams that are tasked with entering data in the water sector adaptation reporting template. It provides a simplistic overall explanation of the template and specific guidance to sections of the template that may normally either be ambiguous or differently interpreted. It plays a critical role in ensuring that the Water Sector Adaptation Reporting Template is used effectively and consistently by all stakeholders. Its importance can be summarized as follows:

- *Standardized Reporting*: The guidance document ensures that all contributors report data in a consistent and standardized manner. This uniformity is crucial for comparing progress across different projects within the water sector in Eswatini, in line with international best practices.
- *Clarity and Usability*: The template requires detailed input of data on various aspects of water sector adaptation and the guidance document simplifies this process by providing clear instructions on how to complete each section, ensuring that data is accurately captured.
- *Alignment with National and International Policies*: By following this guidance, users ensure that the information submitted through the template is aligned with key national frameworks, such as the National Climate Change Policy (2016) and the National Water Policy (2019), as well as international obligations like the Paris Agreement. The guidance ensures that Eswatini's adaptation efforts are properly documented and can be reported at the global level.
- *Data Quality and Consistency*: The guidance document provides detailed explanations of key terms and indicators, helping users avoid common reporting errors and ensuring that the data collected is reliable and comparable over time.
- *Facilitating Verification*: The document supports the verification process by clearly outlining the expectations for each section of the template. This ensures that reported data is comprehensive, transparent, and suitable for both national reporting and submission to international bodies.
- *Enabling Stakeholder Collaboration*: Given the complexity of water sector adaptation efforts, effective collaboration between government ministries, civil society, and local communities is vital. This guidance document ensures that all stakeholders are working with the same definitions and reporting criteria, fostering better cooperation and communication.

1.1.1 Scope

The guidance document is intended to ensure a clear understanding of the requirements of the reporting templates to ensure credible and verifiable data is collected for all the NDC measures captured in the template. Specifically, the MRV system will cover the following dimensions:

Water Supply and Availability

Water availability is one of the most critical areas impacted by climate change in Eswatini. Droughts and variable rainfall patterns have led to significant water shortages, particularly in rural and semi-urban areas. Monitoring water availability will focus on tracking key water supply infrastructure such as dams, reservoirs, and groundwater sources, which are essential to ensuring consistent access to potable water. In this regard, the MRV framework aligns with the Eswatini Water Act, 2003, which governs water resource management and sustainable utilization.

Water Quality

Water quality in Eswatini is increasingly compromised by the effects of climate change, including intensified flooding that causes contamination and droughts that concentrate pollutants. The MRV system will track the effectiveness of water treatment technologies, especially in rural areas where access to safe drinking water is threatened. This will involve monitoring biological and chemical contaminant levels in potable water sources, as mandated by Eswatini's National Water Policy (2018). It also supports the goals of the National Climate Change Policy (2016), which highlights water quality as a priority area for climate adaptation.

Resilience of Water Infrastructure

Eswatini's water infrastructure, including dams, pipelines, and irrigation systems, faces heightened risks due to extreme weather events like floods and droughts. The MRV framework will track the resilience of these structures and assess adaptation projects aimed at upgrading and rehabilitating water infrastructure to withstand climate change impacts. The National Development Strategy (NDS) (1999–2022) underscores the importance of climate-resilient infrastructure for sustainable development, aligning with these monitoring efforts.

Community-based Adaptation Initiatives

Eswatini's rural and semi-urban communities are on the frontlines of climate change, and community-level adaptation measures are vital for addressing water challenges. The MRV system will monitor the success of community-driven initiatives such as rainwater harvesting, water conservation, and local infrastructure improvements. These grassroots efforts align with the National Rural Water Supply and Sanitation Programme (2017–2022), which emphasizes the importance of community engagement and local solutions in addressing water scarcity.

Policy Integration and Institutional Coordination

The MRV framework ensures that adaptation actions in the water sector are in harmony with national policies such as the National Development Strategy (NDS) (1999–2022), National Climate Change Policy (2016), and Eswatini's National Water Policy (2018). Effective coordination among key government ministries, such as the Ministry of Natural Resources and Energy, the Ministry of Agriculture, and the Ministry of Tourism and Environmental Affairs, is critical for the successful implementation of adaptation measures. Moreover, the MRV system will integrate data from the water

sector into national climate change reporting frameworks, supporting Eswatini's commitments under international agreements like the Paris Agreement.

1.1.2 Key Stakeholders

Several stakeholders are key in the successful monitoring of the adaptation progress in the water sector. These stakeholders will be part of different committees, or teams that perform either data collection and analysis, provide data or even verify data for the MRV framework. These stakeholders play different roles in the NCCC, Technical Advisory Committee on Adaptation, Water Sector Adaptation Committee and data collection teams and are listed below;

- Ministry of Natural Resources and Energy (MNRE)
- Ministry of Agriculture (MoA)
- Ministry of Tourism and Environmental Affairs (MTEA)
- Ministry of Health (MoH)
- Ministry of Public Works and Transport (MoPWT)
- Ministry of Economic Planning and Development (MEPD)
- Ministry of Finance (MoF)
- Ministry of Tinkhundla Administration and Development (MTAD)
- Central Statistics Office (CSO)
- National Disaster Management Agency (NDMA)
- University of Eswatini (UNESWA)
- Joint River Basin Authority – Project Board (JRBA-PB)
- Eswatini Water Services Corporation (EWSC)
- Eswatini Water and Agriculture Development Enterprise (EWADE)
- Civil Society Organizations (CSOs) and Non-Governmental Organizations (NGOs)

2. MRV Framework Overview

The MRV Implementation Framework for Water Sector Adaptation has been developed to ensure that adaptation measures in Eswatini's water sector are systematically monitored, reported, and verified. This approach enhances transparency, accountability, and effectiveness of climate adaptation actions, aligning with national and international obligations, such as the Enhanced Transparency Framework (ETF) under the Paris Agreement. The components of the framework are summarized in the sub-sections that follow.

2.1 Monitoring

Monitoring focuses on the systematic collection of data to assess the progress and effectiveness of water adaptation strategies as outlined in the aspirations of the country in the revised NDC. It involves tracking various indicators and metrics related to water resource management, infrastructure resilience, and environmental impacts.

2.1.1 Key Aspects of Monitoring

Adaptation Indicators: For each of the adaptation measures listed in the NDC, a set of indicators have been identified to track the progress of measure in the water sector. The indicators cover aspects of water availability, water quality, infrastructure resilience, institutional capacity and governance and have been extracted from the NDC measures and the key performance indicators for the NDC implementation.

2.1.2 Monitoring Methods

Data collection: will include field surveys where regular assessments of water levels, quality and infrastructure conditions will be monitored against baseline metrics and intended targets. For some of the metrics, real time water quality and quantity monitoring equipment will be deployed in critical locations and the extent of this deployment will also be a measurable of adaptation measures. Remote sensing will also be important for the monitoring of large-scale water bodies, drought conditions, extent of other climate change impacts and land use patterns.

2.1.3 Frequency of Monitoring

Different metrics require different frequency in monitoring and data collection for the adaptation monitoring in the water sector may be on a monthly or quarterly basis, depending on the indicator and nature of adaptation intervention. For instance, groundwater levels might be monitored monthly, while infrastructure resilience could be evaluated annually.

2.2 Reporting

Reporting ensures that the collected data and adaptation outcomes are communicated to relevant stakeholders, including national agencies, international bodies, and local communities.

2.2.1 Key Aspects of Reporting

Reporting in the MRV framework is important in that the reports provide data for strategic decisions and policy adjustments, keeps stakeholders informed to promote collaboration and transparency. The outcomes from each reporting cycle creates new lessons, identifies gaps and improve future adaptation efforts and ensure adherence to national and international reporting obligations

The reports shall include an Executive Summary, Introduction, Vulnerability Assessment, Adaptation Measures Status, Financial Summary, Environmental and Social Impacts, Stakeholder Engagement, Lessons Learned, and Conclusion.

Reporting Flow: data collection teams will submit their findings to the Water Sector Adaptation Committee, which consolidates them into a comprehensive report to be reviewed by the Technical Advisory Committee and shared with the National Climate Change Committee (NCCC) for decision-making and resource allocation.

2.2.2 Report Content

This section outlines the key components of adaptation reports under the MRV framework, ensuring that all submissions are comprehensive, consistent, and aligned with Eswatini's NDC goals. Each report must provide a clear overview of progress, challenges, and stakeholder contributions, offering actionable insights for improving adaptation strategies.

Progress on Indicators

Reports must detail measurable progress on key water sector metrics, aligned with the specified indicators in the MRV framework. This section should include:

- Quantitative Data:
    - Changes in water availability, such as increased reservoir capacity or groundwater recharge rates.
    - Water quality improvements, including reductions in biological or chemical contaminants.
    - Enhanced resilience of water infrastructure, such as upgraded pipelines, treatment plants, or early warning systems.
- Supporting Evidence:
    - Graphs, tables, or visualizations showing trends and comparisons with previous reporting periods.
    - Verified data sources and references to ensure transparency and traceability.

Challenges and Barriers

This section should provide an honest assessment of obstacles encountered during the implementation of adaptation strategies, including:

- Financial Constraints:
    - Limitations in funding for critical projects or delays in financial disbursements.
- Technical Difficulties:
    - Shortages in technical expertise or challenges in deploying new technologies.
    - Difficulties in obtaining or processing reliable data for certain metrics.
- Institutional Gaps:
    - Lack of alignment between policies or conflicting mandates among stakeholders.
    - Insufficient coordination across sectors or regions.

- External Factors:
    - Impacts of unexpected events, such as extreme weather conditions or socio-political disruptions.

Adaptation Effectiveness

This section evaluates the overall effectiveness of adaptation strategies in achieving their intended outcomes. Key aspects to address include:

- Achievement of Adaptation Goals:
    - Reduction in water contamination or pollution levels.
    - Improvements in water-use efficiency across agriculture, industry, and households.
    - Increased resilience to droughts, floods, or other climate impacts.
- Evaluation Metrics:
    - Use calculated fields (e.g., change from baseline, progress toward targets) to provide quantifiable evidence of success.
- Lessons Learned:
    - Highlight insights from successful initiatives and areas requiring adjustments for improved outcomes.

Stakeholder Engagement

Reports must detail the contributions of various stakeholders in driving adaptation efforts, ensuring accountability and inclusivity. This section should include:

- Government Bodies:
    - Roles of the Ministry of Natural Resources and Energy, Department of Water Affairs, and other relevant institutions.
    - Contributions to policy development, resource allocation, and project implementation.
- Local Communities:
    - Participation in adaptation activities, such as rainwater harvesting, conservation agriculture, or community-led water management.
- External Partners:
    - Contributions from international organizations, NGOs, or academic institutions in providing technical assistance, funding, or research support.
- Engagement Metrics:
    - Number of stakeholder meetings, training sessions, or awareness campaigns conducted.

- Feedback received from communities and other stakeholders on adaptation measures.

Alignment with Reporting Standards

To ensure consistency and alignment, reports should:

- Follow the standardized MRV reporting template provided for each NDC action.
- Address each content area comprehensively, using the provided guidance for data collection, verification, and validation.
- Clearly document assumptions, methodologies, and data sources for transparency

2.2.3 Target Audience for Reports

National Stakeholders: different national stakeholders require the adaptation reports for different actions. These stakeholders include government Ministries and departments, research institutions, municipalities, water user associations and communities.

International Developmental Partners: several developmental partners incorporate climate change adaptation in their country plans and the progress in water sector adaptation will enable them to re-program and appreciate the impact of their work. Institutions such as the UNFCCC will receive the reports as part of the reporting obligations under the Paris Agreement.

Local Communities: local communities, most who are recipient of the projects that ensure adaptation and who also affected by the impacts of climate change through disturbed service provision, intermittent unavailability of services and sometimes destruction of water infrastructure or farming will receive reports to ensure transparency and inclusivity.

2.2.4 Reporting Frequency

Reports will be produced annually or biennially for national and international stakeholders, with more frequent quarterly progress updates provided to local authorities.

2.3 Verification

Verification plays a crucial role in ensuring that data on climate adaptation progress in the water sector is accurate, reliable, and reflective of the true status of adaptation efforts. Through a combination of internal and external checks, verification processes help confirm that adaptation interventions are effective and implemented as planned. This section outlines the key aspects of verification, the methods employed, expected outcomes, and how results are reported.

2.3.1 Key Aspects of Verification

The key aspects of verification define the processes that ensure data integrity throughout. These include internal and external audits, on-site inspections, and sampling methods that validate the effectiveness of adaptation measures. Each of these activities strengthens accountability, enabling stakeholders to have confidence in the reported data. The following components are essential for robust verification.

- ***Internal Audits***: Internal verification teams from relevant ministries and other stakeholders will conduct regular audits to ensure that data is being collected in accordance with established protocols and that adaptation measures are being implemented as planned.
- ***Third-party Audits***: External verifiers, including independent auditors or international organizations, will be engaged to conduct objective assessments of the reported data. This will ensure impartiality and adherence to international best practices.
- ***On-site Inspections***: Regular field visits will be conducted to physically verify the progress of adaptation projects (e.g., the construction of water retention structures, the installation of early warning systems, or the performance of water treatment plants).
- ***Sampling and Cross-Verification***: Random sampling of data points will be conducted to cross-verify findings. For example, water quality data collected by automated sensors may be compared with manual field sample results to ensure consistency.

2.3.2 Verification Methods

Verification methods provide the practical tools and procedures necessary to assess the accuracy and consistency of collected data. Standardized operating procedures (SOPs), documentation reviews, and beneficiary feedback mechanisms ensure that data collection and project implementation adhere to established guidelines and reflect real-world conditions. Each method helps to maintain quality and consistency across all stages of adaptation.

- ***Standard Operating Procedures (SOPs)***: Verification will assess adherence to standardized data collection methods and project implementation guidelines. Regular training will ensure that all personnel involved are familiar with SOPs.
- ***Documentation Review***: Progress reports, adaptation plans, and financial records will be reviewed for consistency and completeness.
- ***Beneficiary Feedback***: Surveys and consultations with local communities and beneficiaries of the adaptation measures will provide insight into the real-world effectiveness of the interventions. This also helps ensure that the MRV framework reflects the experiences of those most affected by climate change impacts.

2.3.3 Verification Outcomes

Verification outcomes represent the measurable impacts of adaptation efforts, which are essential for evaluating the effectiveness of interventions. This section details the indicators tracked, the socio-economic and environmental impact assessments conducted, and the feedback mechanisms used to improve adaptation planning. These outcomes support data-driven decision-making and continual improvement in the adaptation framework.

- ***Performance Indicators***: The verification process will track specific indicators that track the progress of adaptation in the water sector. These indicators are described in the MRV framework and in the data collection template. However, based on the availability of data, the performance indicators may be limited to key indicators, such as improvements in water quality, the reduction of climate-related risks (e.g., floods, droughts), and the resilience of water infrastructure.
- ***Impact Assessments***: The socio-economic and environmental impacts of adaptation measures will be evaluated, ensuring that interventions are delivering tangible benefits to communities and ecosystems. This will also include the tracking of such indicators that measure the economic and environmental impacts of climate change adaptation efforts in the water sector.
- ***Feedback Mechanisms***: Verified data will be used to provide feedback for future adaptation planning, helping to refine ongoing strategies and identify new areas for intervention.

2.3.4 Reporting Verification Results:

Reporting verification results ensures transparency and accountability in the adaptation process. Detailed verification reports summarize findings, methodologies, and any discrepancies, while also providing recommendations for improvement. This section also emphasizes the importance of timely reporting to stakeholders, aligning with scheduled reporting periods to ensure that validated data is communicated promptly.

- ***Verification Reports***: After each verification cycle, detailed reports will be produced, documenting the methodologies used, discrepancies found, corrective actions taken, and recommendations for future improvements. These reports will be shared with national and international stakeholders.
- ***Timeliness of Verification***: Verification will be conducted after each reporting period (annually or biennially), ensuring that all reported data has been validated before it is sent to stakeholders.

3. Data Reporting Template

The data reporting template is designed to standardize the collection, organization and submission of data that assists in the measurement of the progress related to the water sector adaptation measures. It aims to ensure consistency, transparency and accuracy in reporting and enables stakeholders to effectively monitor and evaluate progress

towards climate change adaptation goals. The template has been separated into the following sections ; introduction, guidance, content, NDC actions and individual sheets for the 11 NDC measures, to ensure comprehensive coverage of each adaptation initiative.

3.1 Introduction

The introduction section of the NDC Water Adaptation Action Tracker Template provides foundational information on the purpose, structure, and responsibilities associated with tracking water adaptation actions. The introductory section helps users understand the overarching purpose of the template, clarifies roles and responsibilities, and underscores the importance of maintaining accessibility and collaboration across ministries. This foundation ensures that stakeholders have a clear understanding of how the data collection and reporting process will function within the framework of the NDC Water Adaptation Action Tracker Template. It gives information on the;

- purpose of the template
- Responsibility for Completing the Template
- Template Accessibility

3.2 Guidance

This section provides an overview of the NDC Water Adaptation Action Tracker Template. This provides a high-level summary of the requirements for filling the template, including color codes that guide where input is required, for instance, Data entry is required only in the green sheets (NDC 1 to NDC 11 and Project Tracker), where input is limited to light green cells. Orange cells are locked and auto-populate based on inputs from the green cells. Most fields offer dropdown options, except for specific input fields like baseline, target values, indicator data, references, and comments. A detailed guidance on each of the sheets in the template is presented later in this document.

3.3 Content

The Content sheet serves as the central navigation tool within the NDC Water Adaptation Action Tracker Template, providing a clickable Table of Contents for all 16 sheets. This sheet is designed to simplify access to various sections of the template, ensuring that users can quickly locate the specific areas where data entry, review, or reference is required.

3.3.1 Using the Content Sheet

Navigate with Clickable Links

Each entry in the Content sheet is linked directly to the respective sheet. To navigate, simply click on the name of the sheet you wish to access, and you will be directed there automatically. This feature is particularly useful for multi-stakeholder collaboration, as users from different ministries or departments can quickly access the sheets, they are responsible for without scrolling through the entire document.

Understand Sheet Functions

Next to each sheet name, a short description explains the sheet's function, so users can immediately recognize where to input data, review existing information, or access relevant contacts. For example, the description for *NDC Actions* notes that it lists all the Nationally Determined Contributions (NDCs) and associated tracking metrics, making it clear that this sheet is informational.

Locate Data Entry Sections

The Content sheet also specifies which sheets require data entry, such as NDC1 - NDC11 and Project Tracker. This information directs users to only the sheets where input is required, helping maintain the integrity of the template by limiting edits to designated fields.

Organized Reference for Stakeholders

Each entry indicates whether the sheet is for data input, reference, or verification, allowing stakeholders to understand the roles and responsibilities tied to each section. For instance, the *Contact List* sheet serves as a reference for finding responsible personnel, while the *Drop-Down Lists* sheet should be edited only by authorized personnel.

3.3.2 Example of Using the Content Sheet

If a user needs to enter data for NDC 3, they can locate "NDC3" in the Content sheet, read the description to confirm it's the correct sheet for Data Input for NDC 3, and click the link to navigate directly to that section. This ensures efficient data entry and reduces the chance of input errors in the wrong sections.

Key Benefits of the Content Sheet

- Efficiency: Simplifies navigation, reducing time spent searching for sections.
- Clarity: Provides brief descriptions to clarify each sheet's purpose.
- Accuracy: Limits data entry to designated sheets, preventing unauthorized or accidental edits.
- Collaboration: Facilitates multi-stakeholder use by clearly indicating roles and responsibilities for each sheet.

3.4 NDC Actions

The *NDC Water Adaptation Actions* sheet provides an outline of Nationally Determined Contributions (NDCs) for the water sector, paired with measurable metrics to track progress in climate change adaptation. This section guides users on how to understand and input data related to water adaptation actions within the template.

3.4.1 Purpose of the Sheet

- To list the 11-water sector NDC actions designed to address climate change impacts.
- To define measurable metrics for each action, providing a framework for monitoring progress and outcomes.
- To assign responsibilities to specific organizations for data provision and implementation.

3.4.2 Key Features of the NDC Actions Sheet

1. NDC Actions
    a. Each NDC outlines a specific adaptation goal or intervention aimed at enhancing water resource resilience and management.
    b. Examples include improving water governance, strengthening early warning systems, enhancing WASH (Water, Sanitation, and Hygiene), and constructing water storage infrastructure.
2. Metrics for Adaptation
    a. Each action has associated metrics that quantify progress. For example:
        i. Water Governance: Assesses stakeholder participation, transparency, and legal frameworks.
        ii. Water Usage Efficiency: Tracks water consumption and optimization efforts.
        iii. Resilience of Water Infrastructure: Measures the ability of infrastructure to withstand extreme climate events.
3. Descriptions and Explanations
    a. Each metric is accompanied by a brief description to clarify its purpose and relevance. For example:
        i. Catchment Adaptation Plans: Number of plans developed and implemented, and their impact on ecosystems and communities.
        ii. Smart Metering Systems: Tracks the percentage of water consumers using smart metering systems.
4. Responsible Organizations
    a. The sheet identifies the ministries, departments, and organizations accountable for implementing actions and providing data.
    b. For instance
        i. The Ministry of Natural Resources and Energy (MNRE) oversees water governance and resource management.

ii. The Eswatini Water Services Corporation (EWSC) contributes to WASH improvements.

3.5 Data Entry Guidance

- Users must input data for each action's metrics into the designated green cells in the corresponding NDC sheet (e.g., NDC1, NDC2, etc.).
- Key data to include:
  - Baseline values.
  - Current indicator values.
  - Target values (optional but encouraged).
  - References for verification, such as published reports or approved documents.

3.5.1 Examples of NDC Actions and Metrics

- NDC 1: Improve water governance and compliance.
  - Metrics: Water usage efficiency, governance structures, and community engagement metrics.
  - Responsible Organization: MNRE (DWA), Attorney General's Office, MTEA.
- NDC 7: Design and construct water storage infrastructure for multiple uses.
  - Metrics: Number of projects, total storage capacity, and maintenance program effectiveness.
  - Responsible Organization: MNRE (DWA).
- NDC 11: Secure climate-proof water infrastructure.
  - Metrics: Frequency of vulnerability assessments and number of climate-resilient WASH projects.
  - Responsible Organization: MNRE (DWA & EWSC), MTEA, NDMA.

3.6 Contact List

The *Contact List* sheet provides a centralized record of contact details for individuals responsible for completing and verifying the data collection template. It ensures that users can easily identify and communicate with the appropriate personnel from various organizations involved in tracking NDC water adaptation actions.

3.6.1 Purpose of the Sheet

- To provide a clear and accessible list of contacts responsible for submitting and verifying data for each NDC action.
- To facilitate communication and collaboration between stakeholders across different organizations.

3.6.2 Key Features

1. Organizational Representation:
    a. The sheet lists contacts from multiple organizations and departments, such as:
        i. Ministry of Natural Resources and Energy (MNRE): Divisions like DWA (Department of Water Affairs), JRBA (Joint River Basin Authority), and EWSC (Eswatini Water Services Corporation).
        ii. Ministry of Tourism and Environmental Affairs (MTEA).
        iii. Other stakeholders like NDMA (National Disaster Management Agency), Attorney General's Office, and UNICEF.
2. Details Provided:
    a. Each entry includes:
        i. Organization Name: Identifies the relevant ministry, agency, or organization.
        ii. Contact Person: Includes the first name, surname, and position of the responsible individual.
        iii. Contact Information: Provides fields for email addresses and telephone numbers for direct communication. (Some entries may require updates to fill missing details.)
3. Flexibility for Multiple Contacts:
    a. If more than one individual is responsible for a specific organization or action, additional rows can be added to accommodate multiple contacts.

3.6.3 Examples of Key Contacts:

- MNRE (DWA):
    - Spencer Green-Thompson – Hydrology and Water Control Division.
    - Limbo Dlamini – WASH Division.
- ENTC:
    - Sandile T. Gumedze – General Coordination.
- DWA (Laboratory):
    - Makhosazana Shongwe – Water Quality Laboratory Lead.

This sheet is essential for ensuring effective collaboration and accountability during the data collection and reporting process. Users should regularly review and update the contact list to reflect changes in personnel or organizational roles.

3.7 NDC (1) through to NDC (11) sheets

3.7.1 Purpose

This section guides the data entry and best practices for the sheets NDC (1) through to NDC (11). It serves both as a technical manual for data entry teams and a strategic framework for reporting organizations, emphasizing their roles in facilitating collaboration and ensuring data integrity is designed to ensure consistency, accuracy,

and transparency in monitoring, reporting, and verifying (MRV) progress in climate adaptation actions.

3.7.2 Data Entry Guidelines

Editable and Non-Editable Fields

- Editable Fields: Enter data only in the light green cells, designated for data input. These cells capture metrics and indicators critical to tracking NDC progress.
- Non-Editable Fields: Do not alter locked fields (e.g., orange cells). These have automated calculations that process data entered into editable fields, including percentages and progress metrics.

Water Governance Index

This section provides guidance for calculating the Government Water Policy Index, which assesses government efforts in safeguarding water resources and addressing climate change. The index is based on the following components: Policies and Legislation, Regulations, Projects and Infrastructure, Water Resource Management, Climate Resilience Efforts, and Public Awareness. Steps for calculating the index are outlined as follows:

1. Assign Scores to Each Component
    a. For each component, a score between 0 and 100 is assigned based on the government's performance in that area. This can be done using data from reports, evaluations, and expert judgment (stakeholders).
2. Weighting System
    a. Each component is weighted based on its importance in the overall assessment of water resource management of Eswatini. The weights assigned are:
        - Policies and Legislation: 15%
        - Water compliance audits to the water act of 2003: 30%
        - Projects and Infrastructure: 10%
        - Water Resource Management: 20%
        - Climate Resilience Efforts: 10%
        - Public Awareness and Stakeholder Engagement: 15%
3. Calculate Weighted Scores
    a. To calculate the weighted score for each component, multiply the assigned score by the weight of the component. For example:

        Weighted Score = (Score / 100) * Weight

4. Calculate the Overall Index
    a. The overall Government Water Policy Index is calculated by summing the weighted scores of all components:

        Index = Sum of Weighted Scores

    b. This index will give a composite measure of government performance in safeguarding water resources.

NB: When filling out the template, only fill out the light green cells; that is, the score and the comments section. Stakeholder input was considered in assigning weights to ensure the index is comprehensive.

Water Quality Index

This section provides a guide for calculating the Water Quality Index (WQI) for surface water using parameters such as COD, Conductivity, TDS, Colour, pH, TSS, Nitrate, Phosphate, and Dissolved Oxygen. The calculations in the Excel template are based on the following formulas. We first have to calculate the quality rating which is then used to compute the weighted quality and subsequently the water quality index. The standard value (Sn), Ideal value (Id) and weight (Wn) have been prepopulated based on literature (Brown et al, 1972).

1. Quality Rating (Qn)
   a. The quality rating (Qn) is the percentage assigned to each parameter in percentage differences between the observed value and the water quality allowable limits. It is calculated for each parameter using equation 1:

$$Q_n = \frac{Vn - Id}{Sn} x100 \qquad \text{(Equation 1)}$$

Where:

Q_n = Quality rating for the parameter

V_n = Observed value of the parameter

S_n = Standard permissible value of the parameter

I_d = Ideal value of the parameter (usually 0 for pollutants)

2. Weighted Quality
   a. The weight (Wn) is a value apportioned to each parameter with a total of 100% for all parameters. Each weighted parameter is estimated based on literature and the importance each parameter is with reference to the desired quality of the water. Parameters with lower allowable limits will have a higher weighted value than parameters with high limits. Each weighted quality (equation 2) parameter is calculated by multiplying the quality rating (Qn) by the assigned weight (Wn) of the parameter:

Weighted Quality = Qn x Wn (Equation 2)

3. Overall Water Quality Index (WQI)
   a. The overall Water Quality Index (WQI) is calculated using the formula:

$$QWI = \frac{\Sigma(Qn \times \mathrm{Wn})}{\Sigma Wn} \qquad \text{(Equation 3)}$$

Where:

Σ(Qn * Wn) = Sum of all the weighted quality ratings

ΣWn = Sum of all the weights assigned to the parameters

NB: When filling out the template, only fill out the light green cells; that is , the observed value in the specified units and the comments section.

Units of Measurement

To maintain uniformity and precision in data reporting, adhere to the specific units assigned to each metric:

Unit	Description and When to Use
L/ton	For reporting water usage per ton of material, such as agricultural products or waste.
%	For proportional data, including compliance rates and progress toward targets.
L/Day	For daily water consumption or usage in households, industries, or agriculture.
L/Hectare	For water usage in agricultural irrigation or per hectare of land.
Months	For the duration of specific actions or events.
Participation	For tracking the number of individuals or entities involved in activities.
Availability	For measuring the accessibility or presence of a resource or service.
Number of Farms	For counting farms involved in climate adaptation initiatives.
Number of Initiatives	For counting projects, actions, or programs implemented.
Count	For general numeric tracking of items, events, or entities.
N/A	Use when a metric is not applicable, or data is unavailable.
YES/NO	To indicate whether a specific condition, milestone, or action occurred.
Annually	For actions or metrics reviewed or tracked once a year.
Bi-Annually	For actions reviewed or updated twice a year.
Monthly	For metrics or actions that are tracked or reported monthly.

Providing Accurate Data

- **Baseline Data**:
  - For the first reporting period (2024), input baseline data to establish a starting point for tracking progress.
  - Ensure that this data reflects the initial conditions of each metric.
- **Current Data**:
  - Enter the most up-to-date values for the reporting year. Ensure accuracy by cross-referencing sources and validating data against established baselines.
- **Target Values for 2030/2050**:

    - Include optional target values to track long-term progress. These targets should align with Eswatini's climate adaptation goals and enable automated calculations of progress relative to these benchmarks.
- **Data Sources**:
    - Always provide verifiable references for all data entries (e.g., reports, monitoring systems, or studies). Include the source name, date, and, if available, a URL or document link.

Using Calculated Fields

- Change from Baseline (%): Automatically calculates the percentage change between the baseline and current values, offering a clear indication of progress.
- Progress Toward 2030/2050 Targets: Displays progress as a percentage relative to long-term targets, helping stakeholders assess achievements.
- Governance and Water Quality Index: For NDCs involving governance or water quality metrics, input weighted scores for specific components to generate a composite index.

Providing Context in the Comments Section

Use the comments section to enhance transparency and understanding:

- **Explanations**: Document any challenges, assumptions, or deviations (e.g., reasons for marking a metric as N/A, external factors affecting progress).
- **Insights**: Include recommendations or lessons learned, such as potential improvements to methodologies or suggestions for better data sources.

3.7.3 Responsibilities of the Reporting Organization

- Facilitate Communication and Coordination
    - Establish clear communication channels with data collection teams to ensure timely updates on:
        - Data needs.
        - Collection schedules.
        - Methodologies.
    - Designate a reporting focal point to liaise with data collection teams and resolve any challenges.
    - Assign a representative of the organization as the head of the data collection team for each data type, ensuring alignment with organizational goals and facilitating oversight.
- Ensure Data Quality and Accuracy
    - Provide standardized templates and clear instructions on data requirements to all data collection teams.
    - Review submitted data for:
        - Completeness.
        - Consistency with MRV standards.
        - Alignment with specified metrics and indicators.
- Support Capacity Building

    - Identify training needs for data collection teams and organize workshops on:
        - Reporting standards.
        - Data collection methods.
        - Quality assurance protocols.
    - Share best practices to ensure uniformity in interpreting and reporting metrics.
- Integrate Data into Reports
    - Consolidate validated data into periodic reports (e.g., quarterly or annual).
    - Align reports with national and international reporting frameworks, such as the UNFCCC and Paris Agreement and transmit to the Water Sector Adaptation Committee.
- Promote Transparency and Accountability
    - Maintain detailed records of:
        - Data sources.
        - Collection methodologies.
        - Review processes for verification.
    - Collaboratively address discrepancies or gaps in data with collection teams to ensure accuracy.

3.7.4 Collaboration with Data Collection Teams

Roles and Responsibilities

- Clearly define tasks for data collection teams, including:
    - Collecting field data.
    - Monitoring metrics.
    - Conducting surveys.
    - Verifying the accuracy of submitted data.

Develop a Collaboration Framework

- Establish agreements (e.g., Memorandums of Understanding) outlining:
    - Data submission timelines.
    - Quality assurance processes.
    - Collaboration scope.

Align Data Standards

- Provide guidance on:
    - Units of measurement.
    - Sampling methods and geographic coverage.
    - Use of advanced tools like GIS or remote sensing to enhance data precision.

Verification and Validation

- Cross-reference submitted data with benchmarks or other sources.
- Conduct periodic spot checks, audits, or peer reviews.
- Offer constructive feedback to improve future submissions.

3.7.5 Reporting Timeline

The table below outlines the key actions, deadlines, and assigned responsibilities within the reporting process under the MRV framework.

Action	Deadline	Responsibility
Initial Communication with Teams	Start of Reporting Period	Reporting Focal Point
Data Submission	Midpoint of Reporting Period	Data Collection Teams
Review and Feedback	Within Two Weeks of Submission	Technical Advisory Committee on Adaptation
Final Report Submission	End of Reporting Period	National Climate Change Committee

4. Guidance for Data Collection

Effective data collection is central to the success of the MRV system, ensuring accurate monitoring, reporting, and verification of progress toward NDC goals. This section provides guidance on recommended data sources, data quality standards, and frequency of data collection to ensure reliability and consistency across all adaptation actions.

4.1 Data Sources

To collect reliable and relevant data, teams should utilize the following sources based on the nature of the metrics being monitored:

- National Databases and Statistical Records:
  - Eswatini National Policy Database: For policy reviews and compliance metrics.
  - Central Statistical Office (CSO): For demographic, agricultural, and socio-economic data.
  - Ministry of Natural Resources and Energy (MNRE): For water usage, pricing, and abstraction data.
- Climate Monitoring Systems:
  - Eswatini Meteorological Service: For early warning systems, weather forecasts, and climate risk data.
  - Hydrological Monitoring Stations: For river flows, groundwater levels, and drought frequency.
- Community Reports:
  - Collaborate with local councils, traditional leaders, and community-based organizations for qualitative data on stakeholder engagement, water access, and land management practices.
- Water Utility Records:

    - Eswatini Water Services Corporation (EWSC): For data on water distribution, smart metering, and pricing structures.
    - Joint River Basin Authorities (JRBA): For basin-level water usage and compliance data.
- Remote Sensing and GIS Data:
    - Use satellite imagery and GIS tools for land-use mapping, deforestation rates, and water resource availability.
- Academic and Research Institutions:
    - Partner with UNESWA and similar institutions for baseline studies, vulnerability assessments, and evaluation reports.
- International Sources:
    - Access datasets from the UNFCCC, World Bank, or ICAT for benchmarking and comparison.

4.2 Data Quality Standards

Reliable data collection requires adherence to robust quality standards. Follow these best practices to ensure data accuracy and consistency:

- Standardized Data Collection Methods:
    - Use uniform templates provided in the MRV framework to minimize variability.
    - Employ validated methodologies for sample collection, such as ISO-certified protocols for water quality testing.
- Training for Data Collectors:
    - Provide regular training sessions to equip teams with the necessary skills for accurate data gathering, entry, and interpretation.
- Verification Processes:
    - Conduct peer reviews of data by cross-checking sources or using triangulation methods.
    - Perform spot checks or audits to confirm data reliability.
- Error Management:
    - Document and address inconsistencies or errors through a data correction log.
    - Establish thresholds for acceptable data variability (e.g., ±5% for measurements).
- Traceability and Transparency:
    - records of all data sources, including the date, location, and method of collection, to ensure traceability.
    - Clearly document assumptions or extrapolations used in data analysis.
- Real-Time Data Monitoring:
    - Where feasible, use real-time monitoring systems for metrics like river flow or weather conditions to improve data accuracy.

4.3 Frequency of Data Collection

The frequency of data collection should be tailored to the type of metric being monitored and the reporting requirements. Below is a recommended schedule:

Metric Type	Recommended Frequency
Water Usage and Efficiency	Monthly
Policy Reviews and Governance	Annually
Early Warning Systems	Quarterly
Community Engagement Metrics	Quarterly or Annually
Smart Meter Installations	Bi-annually
Land Restoration Efforts	Annually
Water Quality Testing	Monthly or Quarterly
Climate Risk Data	Monthly
Greenhouse Gas Emissions	Annually

4.4 Responsibilities of Data Collection Teams

1. **Data Compilation**:
    a. Gather data from designated sources and input it into the MRV templates within the specified timeframe.
2. **Coordination with Reporting Organizations**:
    a. Collaborate with reporting organizations to address gaps or inconsistencies and verify data quality.
3. **Feedback and Improvement**:
    a. Provide feedback on challenges faced during data collection and suggest improvements to the reporting framework.

4.5 Responsibilities of Supporting Committees

Effective data collection and reporting under the MRV framework rely on collaboration between various stakeholders. This section outlines the specific responsibilities of the Water Sector Adaptation Committee and the Technical Advisory Committee on Adaptation and Resilience in the data collection process.

4.5.1 Responsibilities of the Water Sector Adaptation Committee

Oversight and Coordination

a. Oversee the overall data collection process for water sector adaptation actions under the MRV framework.
b. Coordinate with data collection teams, ensuring that all relevant metrics for water sector NDCs are monitored and reported.
c. Act as the primary liaison between field-level data collection teams and the National Climate Change Committee (NCCC).

Facilitation of Resources

d. Identify and mobilize resources, including personnel, tools, and training, to support efficient data collection.
e. Ensure that monitoring equipment (e.g., water quality testing kits, flow meters) is available and in good working condition.

Verification and Validation

f. Review data submitted by data collection teams for accuracy, completeness, and consistency with MRV standards.
g. Address any identified discrepancies by collaborating with the responsible teams to validate and correct data.

Capacity Building

h. Facilitate training sessions and workshops for data collection teams on MRV protocols, focusing on water-specific metrics.
i. Provide guidance on the interpretation of water sector indicators and methodologies.

Reporting Support

j. Prepare and submit consolidated water sector data to the NCCC, ensuring alignment with Eswatini's NDCs and international reporting standards.
k. Provide input on challenges, gaps, and recommendations to improve future data collection efforts.

4.5.2 Responsibilities of the Technical Advisory Committee on Adaptation and Resilience

Technical Guidance

a. Develop and maintain standardized methodologies for data collection and analysis across all NDC actions.
b. Provide technical input on the selection and interpretation of indicators, ensuring alignment with climate adaptation objectives.

Quality Assurance

c. Establish quality control protocols to ensure that data collected meets international standards (e.g., ISO 14064 for climate adaptation data).
d. Conduct periodic audits of data collection processes to identify and resolve gaps or inconsistencies.

Advisory Support to Data Collection Teams

e. Offer technical support and advice to field teams encountering challenges during data collection, such as methodological issues or data unavailability.
f. Review feedback from data collection teams and recommend adjustments to data collection protocols as needed.

Harmonization and Integration

g. Work with the Water Sector Adaptation Committee and other sectoral committees to ensure that water data integrates seamlessly into the broader MRV framework.
h. Promote the alignment of water sector data with data from other sectors (e.g., agriculture, energy) to support cross-sectoral analysis.

Review and Endorsement of Reports

i. Review consolidated data reports for accuracy and completeness before submission to the NCCC.
j. Endorse final reports, ensuring that they reflect the intended outcomes and meet national and international standards.

Capacity Development

k. Identify knowledge gaps in MRV implementation and develop training materials to address these gaps.
l. Conduct workshops and knowledge-sharing sessions on advanced techniques, such as Geographic Information Systems (GIS) and climate risk modeling

5. Submission and Reporting Process

The submission and reporting processes are critical components of the MRV framework, ensuring that data collected from various sources is consolidated, validated, and reported accurately. This section outlines the standardized procedures for submitting data, preparing reports, and ensuring alignment with Eswatini's NDC goals and international reporting obligations.

5.1 Submission Processes

- Data Submission Timelines
  - Initial Data Submission: Data collection teams must submit their datasets at the midpoint of the reporting period (e.g., quarterly, bi-annually, or annually, as determined by the metric).
  - Final Submission: Consolidated and verified data must be submitted to the Water Sector Adaptation Committee or the responsible sectoral committee by the end of the reporting period.
- Format and Templates
  - Use the standardized MRV reporting templates provided and the guides presented in this document.
  - Ensure all data entries are in the designated fields, using the correct units of measurement (e.g., L/Day, %, Number of Initiatives).
  - Include verifiable data sources and references in the appropriate sections.
- Submission Protocols

- Submit completed templates electronically via the designated platform or email provided by the committee.
- Hard copy submissions, if required, must be accompanied by digital records for verification purposes.

- Supporting Documentation
  - Attach any supplementary documents, such as technical reports, community surveys, or monitoring system outputs, to validate the submitted data.
  - Highlight any assumptions or deviations from standard methodologies in the comments section of the template.

5.2 Reporting Processes

- Consolidation of Data
  - The Water Sector Adaptation Committee will consolidate data from various collection teams, ensuring it is complete and aligns with the NDC-specific metrics and indicators.
  - Cross-sectoral data (e.g., from agriculture, health, or energy sectors) must be integrated to provide a holistic view of adaptation efforts.
- Validation and Quality Checks
  - Committees (e.g., the Water Sector Adaptation Committee and the Technical Advisory Committee) will conduct quality assurance checks on submitted data, including:
    i. Cross-referencing data against historical trends and other sources.
    ii. Verifying automated calculations in the templates (e.g., percentage change from baseline).
    iii. Resolving discrepancies through follow-ups with data collection teams.
- Preparation of Reports
  - Reports must follow the structure outlined in the MRV framework, including:
    i. Introduction: Context of the reporting period and objectives.
    ii. Key Findings: Summary of progress for each NDC action.
    iii. Data Tables: Consolidated and verified data entries.
    iv. Analysis and Trends: Interpretation of data, highlighting achievements and gaps.
    v. Recommendations: Suggested actions for addressing challenges and improving future data collection.
- Submission of Reports
  - Finalized reports must be submitted to the National Climate Change Committee (NCCC) by the specified deadline.
  - The reporting focal point within each sectoral committee must ensure that reports are submitted both electronically and in hard copy, if required.

5.3 Roles and Responsibilities in Reporting

The table below provides an overview of the key milestones and responsibilities within the data submission process

Stakeholder	Responsibilities
Data Collection Teams	Submit accurate and complete data within the prescribed timeline, using the provided templates.
Water Sector Adaptation Committee	Consolidate and validate data from collection teams, ensuring alignment with MRV standards.
Technical Advisory Committee	Conduct quality assurance reviews, provide technical support, and endorse final reports.
National Climate Change Committee	Receive consolidated reports, review national progress, and prepare submissions for international reporting.

5.4 Reporting Timelines

The table below outlines the timeline for reviewing and providing feedback on submitted data.

Action	Deadline	Responsibility
Initial Data Submission	Midpoint of Reporting Period	Data Collection Teams
Final Data Submission	End of Reporting Period	Water Sector Adaptation Committee
Quality Assurance Review	Within Two Weeks of Submission	Technical Advisory Committee
Consolidated Report Submission	End of Reporting Period	Water Sector Adaptation Committee to NCCC
National Report Submission	Annually	NCCC to UNFCCC

5.5 Key Considerations for Submission and Reporting

- **Timeliness**: Adhere to the submission deadlines to allow sufficient time for validation and consolidation processes.
- **Accuracy**: Ensure that all data entries are accurate and supported by verifiable references to maintain credibility.
- **Clarity**: Use clear and concise language in reports, avoiding technical jargon where possible, to make the findings accessible to all stakeholders.
- **Transparency**: Clearly document any assumptions, challenges, or deviations in the comments section to provide context for the data.
- **Collaboration**: Foster collaboration between data collection teams and sectoral committees to address gaps or challenges efficiently.

5.6 Review and Feedback Process

A robust review and feedback process ensures that the data and reports submitted under the MRV framework meet the required quality standards and provide actionable insights for adaptation planning and reporting. This section outlines the steps and responsibilities in the review and feedback process.

Step 1: Initial Review of Submitted Data

- Responsibility: The Water Sector Adaptation Committee conducts an initial review of the submitted data to ensure:
  - Completeness: All required fields in the templates are filled.
  - Adherence to Templates: Data is entered in the correct format, using the appropriate units of measurement.
  - Verifiability: Each data point is accompanied by references to credible sources.
- **Actions**:
  - Flag incomplete or inconsistent entries for clarification.
  - Validate automated calculations (e.g., change from baseline percentages) against the raw data.

Step 2: Detailed Review by the Technical Advisory Committee

- Responsibility: The Technical Advisory Committee on Adaptation and Resilience reviews data submissions for technical accuracy, consistency with methodologies, and alignment with MRV standards.
- Actions:
  - Cross-reference data with national databases, monitoring systems, or historical records.
  - Conduct spot checks or audits on critical metrics (e.g., water governance indicators, early warning system coverage).
  - Review assumptions and methodologies used in generating data, ensuring they are scientifically sound and align with agreed protocols.

Step 3: Feedback to Data Collection Teams

- Responsibility: Both the Water Sector Adaptation Committee and the Technical Advisory Committee provide feedback to data collection teams, addressing any issues identified during the review process.
- Actions:
  - Highlight discrepancies, gaps, or inaccuracies in the submitted data.
  - Provide detailed guidance on how to correct or refine data entries.
  - Offer support to resolve challenges, such as sourcing missing data or improving methodologies.

Step 4: Consolidation and Final Review

- Responsibility: The Water Sector Adaptation Committee consolidates the reviewed data into a single comprehensive dataset.
- Actions:
  - Re-check all corrected or updated data entries.
  - Ensure consistency and alignment between data from different teams or sectors.
  - Prepare a summary of review findings and include a validation report to accompany the consolidated data.

Step 5: Reporting Feedback and Recommendations

- Responsibility: The Technical Advisory Committee and the National Climate Change Committee (NCCC) provide overarching feedback and recommendations for improving future data collection and reporting processes.
- Actions:
  - Identify common challenges or gaps across multiple submissions and propose solutions.
  - Develop action points to improve data quality and streamline future submissions.
  - Share a summary of best practices observed during the review process.

Timelines for Review and Feedback

Action	Timeline	Responsibility
Initial Review	Within One Week of Submission	Water Sector Adaptation Committee
Detailed Review and Validation	Within Two Weeks of Submission	Technical Advisory Committee
Feedback to Data Collection Teams	Within Three Weeks of Submission	Water Sector Adaptation & Technical Advisory Committees
Consolidation and Final Review	End of Reporting Period	Water Sector Adaptation Committee
Feedback on Reporting Process	Annually	Technical Advisory Committee and NCCC

5.7 Key Considerations for the Review and Feedback Process

- **Constructive Feedback**: Ensure that feedback to data collection teams is clear, constructive, and actionable to facilitate improvements in future reporting cycles.
- **Documentation**: Keep detailed records of all review findings, corrections made, and feedback provided for future reference and audits.
- **Collaboration**: Encourage open communication between committees and data collection teams to address challenges promptly.
- **Continuous Improvement**: Use feedback from each reporting period to refine data collection templates, methodologies, and review protocols.

6. Verification and Validation Protocol

The verification and validation process ensures the integrity, accuracy, and reliability of data submitted under the MRV framework. This protocol outlines the steps, responsibilities, and methods for verifying and validating data across all reporting levels.

6.1 Objectives

- Confirm that submitted data aligns with defined metrics, indicators, and baselines.
- Identify and address errors, inconsistencies, or gaps in the data.
- Build confidence in reported outcomes for both national and international stakeholders.

6.2 Verification and Validation Process

Pre-Submission Checks (Data Collection Teams)

- Self-Review: Teams must ensure data accuracy and completeness before submission. This includes:
    - Cross-checking values with raw data sources.
    - Confirming consistency with past reporting trends (where applicable).
- Template Compliance: Ensure all fields are filled in correctly, following the provided instructions and units of measurement.

Initial Review (Sectoral Committees)

- The Water Sector Adaptation Committee will:
    - Review submitted data for completeness, verifying that all required fields are populated.
    - Validate data against baseline values, targets, and other data sources to check for consistency.
    - Flag any discrepancies, missing information, or unusual trends for clarification.
- Data flagged for issues will be returned to the submitting team for correction or additional explanation.

Technical Validation (Technical Advisory Committee)

- The Technical Advisory Committee will:
    - Conduct a deeper technical review to ensure data aligns with scientific and methodological standards.
    - Use benchmarking techniques to compare reported data with:
        - Historical datasets.
        - Comparable data from other sectors or regions.
        - International datasets, where relevant.
    - Validate automated calculations in the MRV templates (e.g., percentage changes, progress toward targets).

Verification Methods

- Cross-Referencing: Compare reported data with independent datasets or reference documents, such as:
  - Climate monitoring system outputs.
  - Water utility records.
  - National databases.
- Spot Checks: Conduct random audits of selected data points to verify accuracy and authenticity.
- Peer Reviews: Facilitate reviews by independent experts to confirm that data methodologies and results are sound.
- On-Site Visits (where applicable): Verify physical implementation of projects or collection activities, such as smart meter installations or land restoration initiatives.

Validation Feedback

- Provide detailed feedback to data collection teams on flagged issues, including:
  - Specific errors or inconsistencies identified.
  - Recommendations for corrections or additional data required.
- Engage in follow-up consultations to address persistent issues or clarify methodologies.

6.3 Roles and Responsibilities

Stakeholder	Verification/Validation Role
Data Collection Teams	Perform self-reviews before submission and respond to feedback from committees.
Water Sector Adaptation Committee	Conduct initial reviews for completeness and consistency.
Technical Advisory Committee	Perform detailed technical reviews, cross-referencing, and peer validation.
National Climate Change Committee	Oversee final verification of consolidated reports before submission to UNFCCC.

6.4 Verification and Validation Timeline

Action	Timeline	Responsible Entity
Self-Review by Data Collection Teams	Before initial submission	Data Collection Teams
Initial Review and Feedback	Within two weeks of data submission	Water Sector Adaptation Committee
Technical Validation and Feedback	Within four weeks of data submission	Technical Advisory Committee
Final Verification	Before consolidated report submission	National Climate Change Committee

6.5 Key Considerations for Verification and Validation

- **Transparency**: Ensure all data sources, assumptions, and methodologies are well-documented and accessible for review.
- **Consistency**: Maintain alignment with baseline and target values, ensuring comparability across reporting periods.
- **Traceability**: Record all steps in the verification process to create a clear audit trail.
- **Timeliness**: Address flagged issues promptly to avoid delays in reporting.
- **Collaboration**: Encourage open communication between data collection teams and committees to resolve issues efficiently

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