



Initiative for Climate Action Transparency – ICAT

A Road Map for the Establishment of a National Measurement, Reporting and Verification (MRV) System of Climate Change Actions in Mozambique

Initiative for Climate Action Transparency - ICAT -

Recommendations for the establishment of a robust national MRV system for climate change policies and actions

Deliverable #3 and 4

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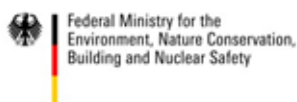
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ABSTRACT

Under the Paris Agreement, all parties to the United Nations Framework Convention on Climate Change (UNFCCC) agreed on the ambitious goal to limit the increase in global average temperature to well below 2°C, and pursue efforts to limit warming to 1.5 C. The main framework to achieve the objective of the Paris Agreement is the countries' Nationally Determined Contributions (NDCs). In this context, the government of Mozambique approved the country's NDC in December 2018, establishing domestic mitigation actions, adaptation measures, and the financial support needed to operationalize its NDC. Yet, the country is in need of more accurate data to better showcase the progress of its NDC and to demonstrate the progress in contributing to reduction of greenhouse gas emissions. Therefore, an improved and efficient monitoring system is necessary for measuring, reporting, and verifying (MRV) the implementation of the policies and actions present in the NDC.

The objectives of this document is, based on the assessment of the current institutional arrangement for national MRV of climate change policies and actions, its gaps and challenges, to design a roadmap for the establishment of a robust national MRV system. Mozambique's MRV system for climate change is characterized by weak coordination, outdated institutional setup, lack of consistent data, lack of robust mechanism for data collection, lack of information sharing mechanism for climate actions, limited institution capacity to collect metadata, and lack of legal instrument to operationalize the information sharing mechanism.

This document proposes an updated structure for the national MRV system. This updated structure replaces institutions that are no longer active, such as the Climate Change Unit (UMC), and the Environment Fund (FUNAB); revitalizes institutions that currently have little involvement, such as the National Council for Sustainable Development (CONDES); and includes other institutions with more active role, such as the National Institute of Statistics (INE), and the Ministry of Economy and Finance (MEF). With respect to legislation, the introduction of a climate change reporting instrument (law or decree-law) is important to guarantee that data related to climate change is shared between institutions and MITADER, therefore allowing this ministry to fulfill its mandate for reporting nationally, on the National System for Monitoring and Evaluation of Climate Change (SNMAMC), and reporting internationally, on the implementation of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement.

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Acronyms

Acronym	Meaning
ACM	Academy of Science of Mozambique (<i>Academia de Ciências de Moçambique</i>)
AFOLU	Agriculture, Forestry and Other Land Use
AMOR	Recycling Association of Mozambique (<i>Associação Moçambicana de Reciclagem</i>)
ANAMM	National Association of Municipalities of Mozambique (<i>Associação Nacional dos Municípios de Moçambique</i>)
BM	Central Bank of Mozambique (<i>Banco de Moçambique</i>)
BUR	Biennial Update Report
CBOs	Community based organizations
CDM	Mozambique Beer Company (<i>Cervejas de Moçambique</i>)
CONDES	National Council for Sustainable Development (<i>Conselho Nacional de Desenvolvimento Sustentável</i>)
COP	Conference Of Parties
CTA	Confederation of Economic Associations (<i>Confederação de Associações Económicas</i>)
DINAB	National Directorate of Environment (<i>Direcção Nacional do Ambiente</i>)
DINAF	National Directorate of Forestry (<i>National Directorate of Forestry</i>)
DTU	Technical University of Denmark
EDM	Mozambique Electricity Company (<i>Electricidade de Moçambique</i>)
ENAMMC	National Strategy for Adaptation and Mitigation of Climate Change (<i>Estratégia Nacional de Adaptação e Mitigação das Mudanças Climáticas</i>)
FAEF	Faculty of Agronomy and Rural Engineering (<i>Faculty of Agronomy and Rural Engineering</i>)
FEMA	Business Forum for Climate Change (<i>Fórum Empresarial do Meio Ambiente</i>)
FNDS	National Fund for Sustainable Development (<i>Fundo Nacional de Desenvolvimento Sustentável</i>)
FUNAE	Energy Fund (<i>Fundo de Energia</i>)
GHG	Greenhouse gases (Gases de efeito de estufa)
GIIMC	Inter-Institutional Group of Climate Change (<i>Grupo Inter-Institucional para as Mudanças Climáticas</i>)
ICAT	Initiative for Climate Action Transparency
IIAM	Mozambique Agriculture Research Institute (<i>Instituto de Investigação Agrária de Moçambique</i>)
INAM	National Institute of Meteorology (<i>Instituto Nacional de Meteorologia</i>)
INE	National Statistics Office (<i>Instituto Nacional de Estatísticas</i>)
INGC	National Institute of Management of Calamities (<i>Instituto Nacional de Gestão de Calamidades</i>)
MAEFP	Ministry of State Administration and Public Affairs (<i>Ministério de Administração Estatal e Função Pública</i>)
MASA	Ministry of Agriculture and Food Security (<i>Ministério da Agricultura e Segurança Alimentar</i>)
MCTESP	Ministry of Science, Technology, Higher Education and Vocational Studies (<i>Ministério da Ciência, Ensino Superior, e Técnico-Profissional</i>)
MEF	Ministry of Economy and Finance (<i>Ministério de Economia e Finanças</i>)
MGC	Matola Gas Company
MIC	Ministry of Industry and Commerce (<i>Ministério da Indústria e Comércio</i>)
MICOA	Ministry for the Coordination of Environment Action (<i>Ministério para a Coordenação da Acção Ambiental</i>)
MICULT	Ministry of Culture and Tourism (<i>Ministério da Cultura e Turismo</i>)



Acronym	Meaning
MINEDH	Ministry of Education and Human Development (<i>Ministério de Educação e Desenvolvimento Humano</i>)
MINEC	Ministry of Foreign Affairs and Cooperation (<i>Ministério dos Negócios Estrangeiros e Cooperação</i>)
MIMAIP	Ministry of Sea, Inland water and Fisheries (<i>Ministério do Mar, Águas, Interiores e Pescas</i>)
MIREME	Ministry of Mineral Resources and Energy (<i>Ministério dos Recursos Minerais e Energia</i>)
MISAU	Ministry of Health (<i>Ministério da Saúde</i>)
MITADER	Ministry of Land, Environment and Rural Development (<i>Ministério da Terra, Ambiente e Desenvolvimento Rural</i>)
MOPHRH	Ministry of Public Works, Housing and Water Resources (<i>Ministério das Obras Públicas, Habitação e Recursos Hídricos</i>)
MRV	Measurement, Reporting and Verification
MTC	Ministry of Transport and Communication (<i>Ministério dos Transportes e Comunicações</i>)
NAMA	Nationally Appropriate Mitigation Actions
NDC	Nationally Determined Contribution
NDC-P-SF	Nationally Determined Contribution Partnership, Support Facility
ODAMAZ	Official Development Assistance to Mozambique
PES	Economic and Social Plan (<i>Plano Económico e Social</i>)
REA	Environment Status Report (<i>Relatório do Estado do Ambiente</i>)
REDD+	Reduction of Emission from Deforestation and Forest Degradation
SAN	Food Security and Nutrition (<i>Segurança Alimentar e Nutricional</i>)
SCN	Second National Communication (<i>Segunda Comunicação Nacional</i>)
SETSAN	Technical Secretariat for Food Security and Nutrition (<i>Secretariado Técnico de Segurança Alimentar e Nutricional</i>)
SISTAFE	The State Financial Administration System (<i>Sistema de Administração Financeira do Estado</i>)
SNIGEE	National System of Greenhouse Gas Inventories (<i>Sistema Nacional de Inventários de Gases com Efeito Estufa</i>)
SNMAMC	National System of Monitoring and Evaluation of climate change (<i>Sistema Nacional de Monitoria e Avaliação das Mudanças Climáticas</i>)
UEM	University Eduardo Mondlane (<i>Universidade Eduardo Mondlane</i>)
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change (<i>Convenção Quadro das Mudanças Climáticas</i>)
UNIDO	United Nations Industrial Development Organization
UP	Pedagogic University (<i>Universidade Pedagógica</i>)
WBG	World Bank Group
WWF	World Wild Fund for Nature

1 INTRODUCTION

1.1 Background

In 1992 almost all countries joined to respond to the effects of climate change and its impacts, culminating in the adoption of the United Nations Framework for Climate Change Convention (UNFCCC, or Convention). Following the adoption of the UNFCCC, Mozambique has been an active member to the several events organized by the Convention. In 2015, the UNFCCC organized the COP21, and Parties reached a landmark agreement to tackle climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. The Paris Agreement builds upon the previous efforts to increase the ability of countries to deal with the impacts of climate change, and to make finance flows consistent with low Greenhouse gas (GHG) emissions and a climate-resilient pathway. The Agreement provides for an enhanced transparency framework for action and support, with the vision to build trust and confidence about the implementation of the Agreement by the Parties.

With the vision to support the implementation of the transparency framework for action and support, a multi-donor neutral fund was designed to improve the capacity of developing countries to assess the impacts of policies and actions to implement the Nationally Determined Contribution (NDCs). This multi-donor neutral fund is the Initiative for Climate Action Transparency (ICAT). In Mozambique, ICAT was introduced by the partnership between UNEP and the Technical University of Denmark (DTU), with a focus on the country needs related to national MRV system and the assessment of impacts of climate policies included in the NDC. The Ministry of Land, Environment and Rural Development (MITADER) was engaged as implementing entity and the project cooperation agreement was signed on 23rd June 2017. In order to implement the activities specified in the work plan, the ICAT project in Mozambique launched three consultancies covering different sets of activities. This report is about the component "Design of a roadmap for the establishment of a national Measurement Reporting Verification (MRV) system in Mozambique".

1.2 Objectives

As per the terms of reference, the purpose of this component was to reach a consensus between the stakeholders involved in climate change in order to define an appropriate structure for the management of the national MRV system, and assign specific roles, responsibilities and levels of authority to the involved institutions.

Specifically, this component has the following objectives:

- Present the institutional, legal, and procedural reforms needed to establish a robust national MRV system;
- Suggest options for improvement of data availability.

1.3 Organization of the report

The organization of the report is the following. Chapter 1 introduces the assignment including the rationale of the consultancy and the problems it aims to address. Under the same chapter, the objectives and the structure of the report are presented. Chapter 2 describes the methodology used to produce this deliverable, the steps taken to collect information, and the types



of institutions interviewed. Chapter 3 describes the existing national system of monitoring and assessment of climate change. Chapter 4 suggests improvements in the areas of institutional setup, legal setup, procedural setup, and data availability. Finally, a road map with recommended actions for establishing a robust national MRV system is presented in chapter 5. This is followed by chapters 5 and 6, which list the bibliography used and the annexes.

2 METHODOLOGY AND APPROACH

The overall methodology applied for this deliverable was desk review of the relevant national documents related to the measurement, reporting and verification (MRV) of climate change data. This approach was combined with consultation meetings with the stakeholders of the national MRV system, based on their capacities, area of expertise, institutional hierarchy, and engagement in previous activities. The instrument for information gathering about the type of information produced by the institutions and the main roles and responsibilities of the stakeholders in the climate change agenda is appended as annex 1. The main steps of the work were the following.

Interviews

Informal interviews with individuals who are familiar with MRV of climate change in Mozambique, to obtain information about institutional roles and responsibilities, and levels of authority in the national MRV system (list of people interviewed in annex 2).

Detailed reviews and compilation of data and information

This consisted in reviewing project documents, studies, reports and publications, and compiling information collected at organizations and institutions. The reports and documents reviewed were the following:

- The National System for Monitoring and Evaluation of climate change (SNMAMC);
- The National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC);
- Mozambique initial national communication to UNFCCC;
- The report on the national inventory on greenhouse gases;
- Nationally Determined Contribution of Mozambique to UNFCCC;

Consultation workshops

The consultant conducted a series of workshops with the stakeholders for discussing the establishing of roles and responsibilities and levels of authority in the national MRV system including:

- Sub-activity 1: Definition of MRV requirements and procedures within and between institutions and the private sector;
- Sub-activity 2: Design the necessary legal arrangement to enable the implementation and operationalization of the national MRV system and procedures;

The workshops were held in Maputo, at the premises of the Ministry of Land, Environment and Rural Development on 3, 4, 6, and 7 June 2019 and included institutions from the sectors of energy, agriculture and land use, industry and commerce, and environment. The full list of the institutions is presented in annex 3.

Inter-institutional validation workshop

Following the submission of intermediary reports by the consultants, a validation workshop was held in Maputo, on 18th November, with leadership of the Permanent Secretary of Ministry of Land, Environment and Rural Development (MITADER), with the aim of presentation and validation of the three consultancies undertaken by the ICAT project in Mozambique.

The workshop was attended by government technicians, civil society, non-governmental organizations (NGOs), and participants from universities. The agenda of the workshop is appended in the annex 4. The workshop opened with an intervention by the National Director of Environment, followed by an introduction about the ICAT project by the of the ICAT representative from UNEP DTU Partnership. The second intervention was done by the Permanent Secretary of MITADER and was about the vision of the MITADER on climate change transparency and actions towards a more transparent reporting. In the second part of the workshop, the three consultants presented their work. These presentations were followed by two rounds of debate, with consultants being asked to address the questions at the end of each debate. The workshop ended with next steps presented by the National Directorate of Environment (DINAB).

The following are the main recommendations from the validation workshop that were recommended for the three consultants:

- For the REFIT consultancy
 - Include the water sector in the analysis
- For the NAMA for coal consultancy
 - Revise the maximum impact of the NAMA;
 - Include civil society in these discussions to allow involvement of that sector due to its importance in the coal industry
 - Account for gender participation;
- For the MRV consultancy
 - Revise the information sharing mechanism
 - Address options to operationalize the information sharing mechanism;
 - Emphasize the relevance of INE in provision of information about climate change;
 - Address how the MRV for climate change can be embedded into the National Statistics System;
 - Develop options for information and data sharing mechanism;
 - Address the issue of how can the country better organize in order to meet the reporting requirements.

3 THE EXISTING SYSTEM: SNMAMC

3.1 Background

The National Climate Change Monitoring and Evaluation System (*Sistema Nacional de Monitoria e Avaliação das Mudanças Climáticas - SNMAMC, in Portuguese*) was developed by the government of Mozambique, with support of international non-government and development organizations (World Bank, United Nations Development Programme, Danish International Development Agency, Save the Children, World Vision, among others), to ensure the systematic monitoring and evaluation of climate change responses in an integrated way, with efficiency and effectiveness.

Approved in 2014, the SNMAMC framework provides the basis for national reporting on climate change to the Council of Ministers, international conventions, and climate financing bodies. SNMAMC was designed to fully integrate with government planning and budget systems and to ensure that relevant government sectors use the framework to report on climate change impacts, progress on adaptation to and mitigation of climate change, and development of policies and institutional responses to climate change.

The objectives of the SNMAMC (2015) in Mozambique have been defined as follows:

- Improve accountability in use of resources and verifying effective allocation for the sectors at all levels and for the most vulnerable groups;
- Support inter-sectoral coordination and the implementation of the National Strategy for Adaptation and Mitigation of Climate Change (*Estratégia Nacional para Adaptação e Mitigação das Mudanças Climáticas - ENAMMC, in Portuguese*) and Climate Change Action Plans (*Planos de Ação das Mudanças Climáticas, in Portuguese*) through monitoring and learning from the implementation process;
- Evaluate to what extent the ENAMMC has contributed to reduce vulnerability to Climate Change and attain Mozambique's national development goals.
- Inform policy-making and planning by developing new evidence on effectiveness of adaptation, mitigation and disaster risk reduction approaches.
- Fulfil the reporting requirements at national and international levels.

The SNMAMC is an information and data compilation instrument that describes the mandate of the Ministry of Land, Environment and Rural Development (MITADER), to report annually to the Council of Ministers on the progress and impacts of implementation of the ENAMMC. The key components of SNMAMC are as follows:

- Framework indicators at national and sectoral level to track progress towards the ENAMMC;
- Greenhouse gas (GHG) information obtained from independent GHG inventory report and its impact in policy making and emission reduction actions towards low carbon development;
- Climate change expenditure assessments and consistent tracking of climate change finance;

- Assessment of vulnerability to climate change at sectoral and local level, and assessment of changes in vulnerability in result of adaptation policies and interventions;
- Long term program evaluation to assess the impacts and effectiveness of climate change response over a period of 10-15 years;
- Learning mechanism to understand what approaches and technologies are successful; and
- Communication and sharing of monitoring & evaluation (M&E) results to inform stakeholders and influence policy development and implementation.

3.2 Mechanism for information sharing

Figure 1 presents the mechanism for information sharing developed by SNMAMC. The overall coordination of the implementation of SNMAMC is the responsibility of MITADER through the Department of Climate Change (DMC). MITADER is supposed to summarize information to produce the SNMAMC report. In order to operationalize the SNMAMC, the DMC needs to work closely with the Ministry of Economy and Finance (MEF), who receives information from all the other ministries. The information would be collected through the Economic and Social Plans (PES), deposited at the Ministry of Economy and Finance (MEF).

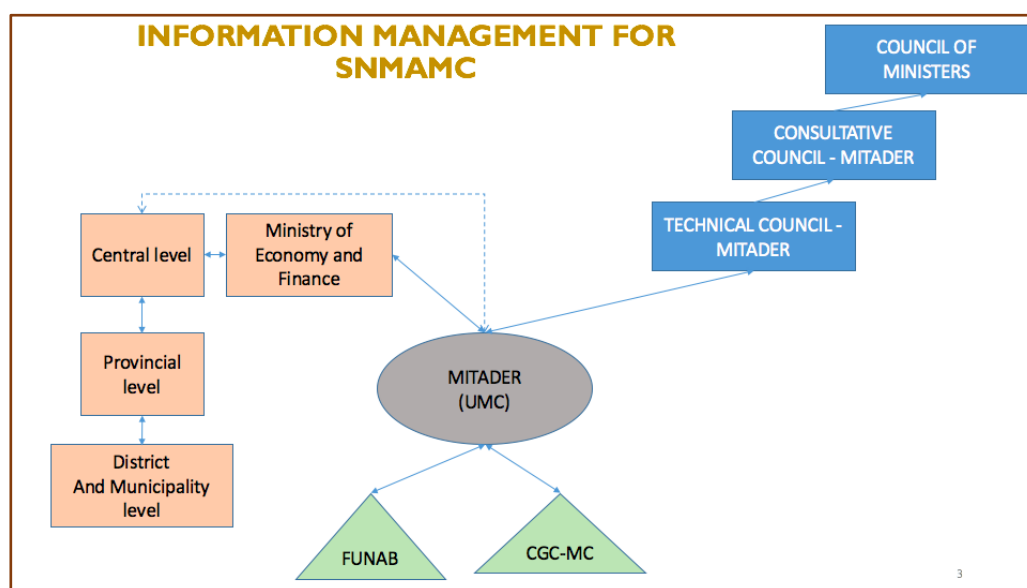


Figure 1: Mechanism for information sharing of SNMAMC

CGC-MC: Centro de Gestão de Conhecimento em Mudanças Climáticas (Knowledge Management Center of Climate Change)
 CONDES: Conselho Nacional de Desenvolvimento Sustentável (National Council for Sustainable Development)
 FUNAB: Fundo do Ambiente (National Environment Fund)
 MITADER: Ministério da Terra, Ambiente e Desenvolvimento Rural (Ministry of Land, Environment and Rural Development)
 UMC: Unidade das Mudanças Climáticas (Climate change coordination Unit)

Two institutions were given a supporting role: the National Environment Fund (FUNAB), with the role of fiduciary institution to provide information on climate change expenditure, and the Knowledge Management Centre for Climate Change (CGC-MC), with a mandate to assist

MITADER with the peer review of SNMAMC report. Following the elaboration of the SNMAMC report, the technical-council¹ of MITADER would revise it and submit it to the consultative-council² before being sent to the Council-of-Ministers³ for final approval (Figure 1).

3.3 Challenges and barriers

Some of the key challenges that remain on the implementation of the SNMAMC include inter alia:

- Ineffective mechanisms for coordination of institutions responsible for monitoring climate change (MITADER, Academy of Science, MASA, MIREME, MTC, MIC, MEF, INE, FNDS and others) and for providing information to produce the SNMAMC reports;
- Limited knowledge of government staff on monitoring and evaluating the effects of climate change;
- Limited availability of data, variable data quality, and lack of multi-level reporting systems (from local scale to a national level).

In sum, the process of reporting information about climate change actions to the government of Mozambique and to international conventions is hindered by several barriers summarized in box 1.

Box 1- Key challenges remaining for the implementation of the SNMAMC

a) Lack of up to date indicators – The SNMAMC is a recognized instrument to support monitoring and evaluation of climate change. Because the Nationally Determined Contribution (NDC) or the Paris Agreement were developed after the introduction of the SNMAMC, it is necessary to update the SNMAMC with newly developed indicators, as for example those resulting from the pilot ex-ante evaluation of the NAMA for vegetable coal and the NAMA for Renewable feed in tariff-REFIT (work completed under the ICAT project in Mozambique).

b) Weak legal instrument to guide reporting on climate change – The SNMAMC does not have a legal instrument that supports its operationalization, therefore its implementation relies on the goodwill of the institutions. Many requests from the SNMAMC (such as annual reporting to the Council of Ministers) are not being implemented. The legal instrument could be a law (on a long term basis and approved by the legislative bodies), decree (medium term and approved by the Council of Ministers) or even a ministerial diploma (short term and approved by a minister, or a group of ministers).

c) Lack of public documentation of SNMAMC - The SNMAMC is not publicly available in the common government information sharing mechanisms such as sector's webpage, library, or repository. Absence of these documents make them unknown to many stakeholders and decision makers.

¹ The Technical Council is a technical meeting lead by the Permanent Secretary attended by the national directors of sectors in MITADER, and the leaders of institutions that work in the area of influence of MITADER (for example FNDS, Agencia de Qualidade Ambiental).

² The Consultative Council is a meeting lead by the minister of MITADER, where all the participants of the technical council are invited.

³ The Council of Ministers is a meeting lead by the President of the Republic where all the ministers attend, and representatives from other agencies (for example, FNDS, Agencia de Qualidade Ambiental) can be called to participate, depending on the topic.

d) Lack of finance to operationalize SNMAMC - The SNMAMC lacks financial support from the institutions for full operationalization. The SNMAMC report requires data that in some cases require specific surveys and specific expertise, which may not be available or may require some effort and cost to obtain.

e) Lack of ownership of the SNMAMC - The SNMAMC was developed with support from national and international institutions. The fact that this instrument was strongly supported and lead by the implementation partners affected its ownership and institutionalization.

f) Limited capacity of many institutions to collect data specific on climate change - Even though many institutions have specialized technicians in statistics, their capacity and level of knowledge on the issues of climate change is limited and more training is needed.

Periodicity of SNMAMC

The SNMAMC is supposed to be reported on an annual basis while the NDC, the National Communication and the Biennial Update Report have different reporting periods. Adjusting the reporting of these documents to a similar period would allow the country to organize itself to better respond to national and international commitments. For example, if the periodicity of reporting on the SNMAMC is adjusted to the reporting on implementation of NDC (every 2 years, report through the biennial transparency report) would be advantageous in terms of data collection because of synergies in the objectives.

4 THE FUTURE NATIONAL MRV SYSTEM

4.1 Recommendations for the institutional setup

4.1.1 The previous information sharing mechanism

The previous information sharing mechanism for MRV of climate change (Figure 2) was composed by MICOA (now named MITADER) that used to receive information from the Climate Change Coordination Unit (CCU), which had the responsibility to provide reports on climate change, after validation by the Council of Ministers. The GIIMC, constituted by members representing a number of sectoral ministries, was instrumental in the preparation of the ENAMMC by providing their specific sector information and comments about the content of the ENAMMC. GIIMC's role included provision of inputs about the capacity development needs included in ENAMMC.

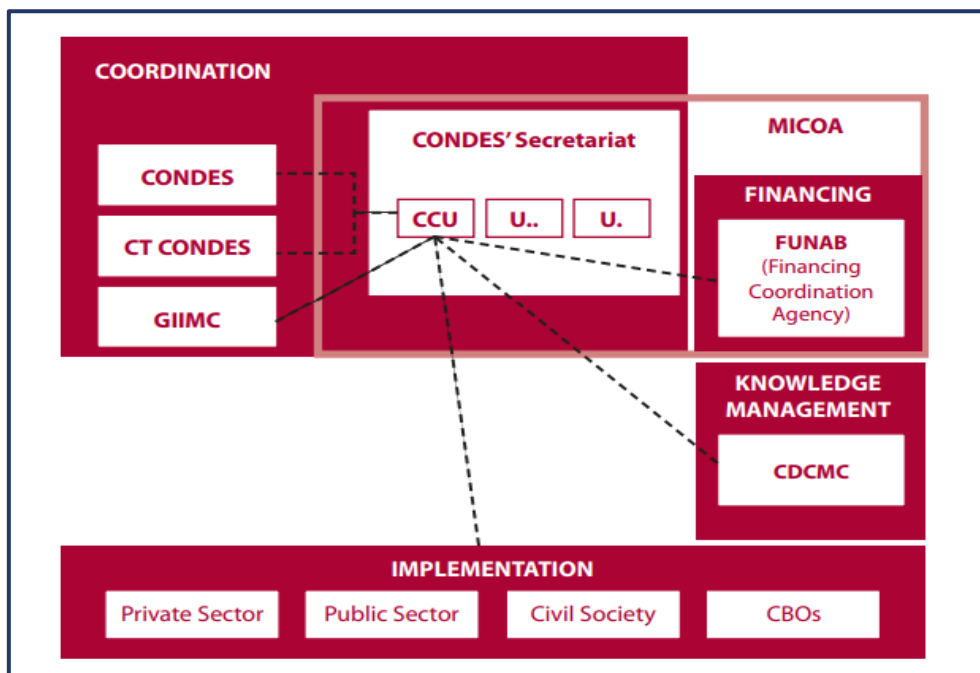


Figure 2: Institutional mechanism for coordination, implementation and financing for M&E (MICOA 2012)

CBOs: Organizações Baseadas na Comunidade (Community Based Organizations)
 CCU: Unidade das Mudanças Climáticas (Climate Change Coordination Unit)
 CDCMC: Centro de Conhecimento em Mudanças Climáticas (Knowledge Center of Climate Change)
 CONDES: Conselho Nacional de Desenvolvimento Sustentável (National Council for Sustainable Development)
 CT CONDES: Conselho Técnico do CONDES (Technical Council of CONDES)
 FUNAB: Fundo do Ambiente (Environment Fund)
 GIIMC: Grupo Inter-institucional de Mudanças Climáticas (Inter-Institutional Group of Climate Change)
 MICOA: Ministério para a Coordenação da Ação Ambiental (Ministry for the Coordination of Environment Action)
 U.: Unidades (Unities) (Other possible units not predetermined)

The technical council of CONDES (CT-CONDES) hosted the presentations, discussions and revisions of ENAMMC before submission to CONDES, where the document was endorsed to be submitted to the Council of Ministers for approval. CONDES hosted the climate change unit (CCU), responsible for the development of the SNMAMC for ENAMMC. The National Environment Fund (FUNAB) was responsible for coordination of finance, and the Knowledge Management Center of Climate Change (CDCMC) had a task to systematize and document scientific, technical and local knowledge. Community Based Organizations (CBO), private sector and civil society were responsible for supporting the operationalization of climate change agenda and implementation of climate change actions at community level. Public sector will be responsible for definition of policies, regulations and technical standards in line with climate change, as well as design and implementation of climate change projects.

The reporting process used to mandate sectors to submit climate change information directly to MITADER, via the CCU, in order to produce the reports. The past structure had the public sector, private sector, and civil society at the same level of responsibility in reporting, which affected the mandate for provision of information from subordinated institutions in the private sector and civil society to the lead sectors. The National Institute of Statistics and the institutions controlling the financial support had very limited influence in the structure.

A revised structure for climate change information sharing was proposed in the Plan for the Operationalization of the Nationally Determined Contribution (NDC) and presented in 2018. The information sharing mechanism presented in the NDC (Figure 3) represents an update in terms of the names of the institutions involved and the introduction of minor changes. The new structure proposed the introduction of the National Directorate of Monitoring and Evaluation (DNM), which has never been implemented and therefore cannot produce any effect. Also the institutional arrangement proposed by the NDC proposed an introduction of the Department of Planning and Cooperation (DPC) to coordinate implementation of the planning cycle of the ministries, especially the Social and Economic Plans (PES). The National Fund for Sustainable Development (FNDS) was introduced with similar role as FUNAB. And finally, the Community Based Organizations (CBOs) were replaced by the academia to strengthen the need for more research as well as technical support. The institutional arrangement proposed in the NDC does not include several institutions considered relevant to climate change⁴ structure, namely the National Institute of Statistics (INE), the Ministry of Economy and Finance (MEF), the multilateral organizations and development organizations, and introduces units that have never functioned (DNM). Moreover, it did not resolve the issue of lack of a sectoral reporting line (no reporting from the private sector and civil society to the line ministries) making the reporting responsibilities weak.

⁴ Climate Change relevant institutions are identified by MITADER (2016) in the document that operationalizes the Climate Change Network. They are MITADER, MASA, MOPHRH, MICULT, MAEFP, MMAIP, MISAU, MCTESTP, MEF, MINEDH, MINEC, MIREME, MTC, and MIC.

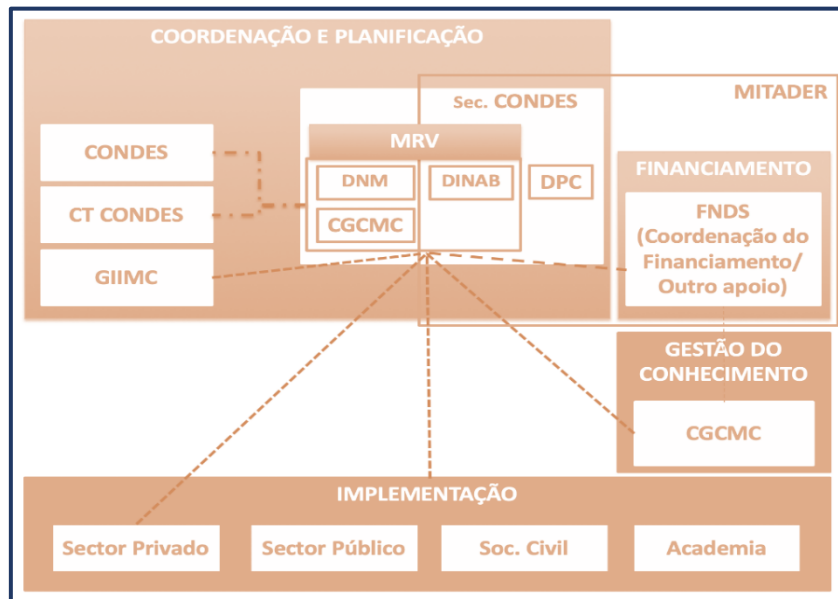


Figure 3: Information sharing mechanism proposed in the Plan for the Operationalization of the NDC

CGCMC: Centro de Gestão de Conhecimento em Mudanças Climáticas (Knowledge Management Center of Climate Change)
 CONDES: Conselho Nacional de Desenvolvimento Sustentável (National Council for Sustainable Development)
 CT CONDES: Conselho Técnico do CONDES (Technical Council of CONDES)
 DINAB: Direcção Nacional do Ambiente (National Directorate of Environment)
 DNM: Direcção Nacional de Monitoria (National Directorate of Monitoring)
 DPC: Direcção de Planificação e Cooperação Internacional (Directorate of Planning and International Cooperation)
 FNDS: Fundo Nacional de Desenvolvimento Sustentável (National Fund for Sustainable Development)
 GIIMC: Grupo Inter-institucional de Mudanças Climáticas (Inter-Institutional Group of Climate Change)
 MRV: Monitoria, Reporte e Verificação (Monitoring, Reporting and Verification)
 Sec CONDES: Secretariado do CONDES (Secretariat of CONDES)

MITADER continues to play a coordination role by serving as secretariat of the National Council for Sustainable Development (CONDES), through the National Directorate of Environment (DINAB). The revised structure also includes the Department of Planning and Cooperation (DPC), which is a unit that coordinates the elaboration of Economic and Social Plans (PES) and guarantees the linkage with the Ministry of Economy and Finance for provision and analysis of information from the PES. However, the Ministry of Economy and Finance (MEF) is not included in the figure. The Plan for the Operationalization of the Nationally Determined Contribution (NDC) suggests the National Institute of Statistics to serve as a repository archive and management of climate change information. The other institutions remain with their original roles.

4.1.2 Proposed future information sharing mechanism

The proposal for the future reporting structure is to have sectoral and cross-sectoral priorities and that the institutional arrangements on climate change are clearly and well-aligned through the relevant ministries. Under the proposed future structure (figure 4 below), the Inter-institutional Group for Climate Change (GIIMC) will continue playing its role and MITADER will continue with a coordinating role of that multi-sectoral group. The various stakeholders of climate change will play relevant roles in reporting climate change. The Academy of

Science of Mozambique (ACM) is called to improve its role in terms of participation in the elaboration and revision of climate change documents with an expanded role in terms of revision of major documents and conduction of studies on specific matters about the climate change topics.

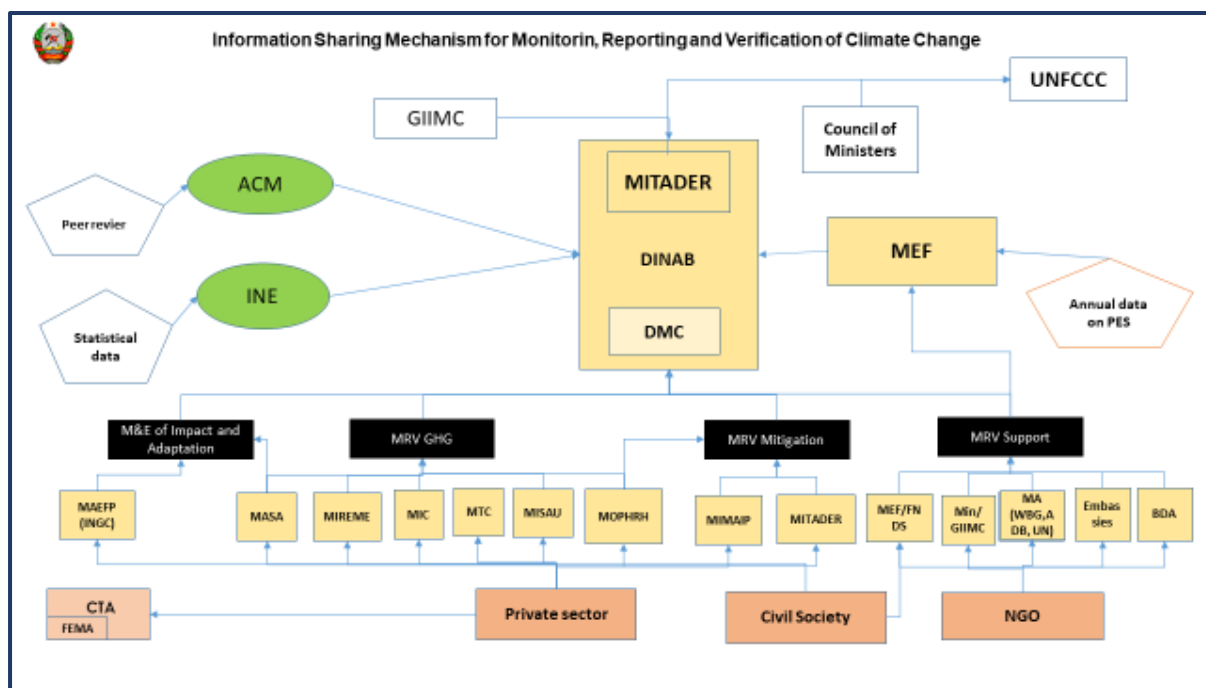


Figure 4: Mechanism for information sharing for MRV of climate change (developed by the author).

ACM: Academia de Ciências de Moçambique (Academy of Sciences of Mozambique)
 ADB: African Development Bank
 BDA: Bilateral development agencies (USAID, JICA, SIDA, etc.)
 DINAB: Direcção Nacional de Ambiente (National Directorate of Environment)
 DMC: Departamento de Mudanças Climáticas (Climate Change Department)
 FNDS: Fundo Nacional de Desenvolvimento Sustentável (National Fund for Sustainable Development)
 GIIMC: Grupo Inter-institucional de Mudanças Climáticas (Inter-Institutional Group of Climate Change)
 INE: Instituto Nacional de Estatística (National Statistics Office)
 INGC: Instituto Nacional de Gestão de Calamidades (National Institute of Management of Calamities)
 MA: Agentes Multilaterais (Multilateral Agents)
 MAEFP: Min. de Administração Estatal e Função Pública (Ministry of State Administration and Public Affairs)
 MASA: Min. de Agricultura e Segurança Alimentar (Ministry of Agriculture and Food Security)
 MEF: Min. de Economia e Finanças (Ministry of Economy and Finances)
 MIC: Min. da Indústria e Comércio (Ministry of Industry and Commerce)
 MIMAIP: Min. do Mar, Águas Interiores e Pescas (Ministry of Sea, Inland Water and Fisheries)
 MinGov: GovernmentCC relevant Ministries
 MIREME: Min. dos Recursos Minerais e Energia (Ministry of Mineral Resources and Energy)
 MISAU: Ministério da Saúde (Ministry of Health)
 MITADER: Min. da Terra, Ambiente e Desenvolvimento Rural (Ministry of Land, Environment and Rural Development)
 MOPHRH: Min. das Obras Públicas, Habitação e Recursos Hídricos (Ministry of Public Works, Housing and Water Resources)
 MTC: Min. dos Transportes e Comunicações (Ministry of Transport and Communication)
 UN: United Nations Agencies
 UNFCCC: United Nations Framework Convention on Climate Change
 WBG: World Bank Group

MEF will be included to gather and share climate change information through the social and economic plans (PES), and INE will produce annual yearbooks with basic climate change information. MITADER will take responsibility over the MRV and fulfil the recommendations of the National Climate Change Strategy (ENAMMC) through its Climate Change Department (DMC). The DMC will coordinate climate change reporting at a higher level. MITADER needs to elevate the discussions from department level to a higher level, at the level of National Director or at the managerial level within the ministry.

The proposal for the new structure (figure 4) will also strengthen and improve the linkage between the ministries overseeing the sectors and the private sector companies. In the past, MITADER had to seek information directly from private sector companies, for instance: aluminium melting company (MOZAL) and Mozambique Petroleum (PETROMOC), for information about quantity of metal melted and quantity of petroleum imported, respectively. The new structure proposes that lead ministers request information from the organizations, agencies, and bodies under their jurisdiction and send this information to MITADER. Therefore, information about MOZAL will be requested from the Ministry of Industry and Commerce (MIC), information from PETROMOC will be gathered by the Ministry of Mineral Resources and Energy (MIREME).

The process of collection of data will be conducted by the sectors and organized into four categories, namely: (a) MRV of greenhouse gas emissions, (b) MRV of mitigation actions, (c) M&E (monitoring and evaluation) of climate change impacts and adaptation, and (d) MRV of support needed and received. The institutions depicted in the figure 4, under each category, will have responsibility to collect information for the country to be able to measure, report, and verify data on GHG emissions, mitigation actions, impacts of climate change and adaptation, and support needed and received, in the light of the climate change law that will be established. The information collected will be made available in the official webpages for other users and for other studies.

The MRV of greenhouse gas emissions will be done through the National Inventory System of Greenhouse Gas (SNIGEE), which is overseen by MITADER, under the National Directorate of Environment. MITADER uses the SNIGEE to guide sectors for data collection on GHG indicators. Usually the country hires lecturers from the university as consultants for preparing the national GHG inventory. The MRV of GHG emissions will involve 6 ministries, namely MIREME, MASA, MIC, MTC, MISAU and MOPHRH, with the coordination of MITADER. Each ministry will create a technical working group that will lead the information sharing and reporting of information necessary for the MRV of GHG emissions. These technical working groups group institutions under a thematic area for the national system for inventory of greenhouse gas. Therefore, the energy group is composed by the sectors of energy and transport; the agriculture group is composed by the sectors of agriculture and environment; the industrial processes is composed by the trade and industry sectors; and the waste group is composed by the health, environment and public works. Each ministry is responsible for collecting information from the organizations, agencies, and bodies subordinated to their jurisdiction, including private sector and civil society.

The institutions involved in the MRV of mitigation are all the institutions involved in the MRV of GHG emissions - MASA, MIREME, MIC, MISAU, and MOPHRH - and also MIMAIP and MITADER. MIMAIP will provide information about the mangroves and oceans and MITADER will lead the provision of information about forestry, and land use. From an adaptation perspective, MAEFP will provide information related to adaptation co-benefits on mitigation.

The M&E of adaptation will involve all the institutions engaged in actions that help populations to adapt to the effects of climate change. These institutions are: MAEFP (especially INGC), MASA, MIREME, MIC, MTC, MISAU, MOPHRH, MIMAIP, MITADER. There is also a presence of private sector and civil society in adaptation.

The MRV of support needed and received looks at financial support, technology transfer and capacity-building needed and received. The MRV of financial support needed and received will involve the MEF and can build on the previous experience with the Climate Public Expenditure and Institutional Review (CPEIR) and the Public Environment Expenditure Report (PEER). The information used to produce the PEER was obtained from the state financial administration system, E-SISTAFE, and from the Official Development Assistance to Mozambique database (ODAMOZ). The MRV of support also includes capacity-building, which is under MITADER's responsibility and can be informed by all relevant institutions to climate change or through reporting from GIIMC members. The same applies to technology transfer, which can be informed by the members of GIIMC.

4.1.3 *Specific roles and responsibilities of the institutions*

4.1.3.1 **Ministry of Land, Environment and Rural Development (MITADER)**

The MITADER has the primary responsibility for matters related to climate change and environment, with a strong emphasis on cooperation with other ministries, such as MASA, MIREME, MOPHRH, MIC, MTC. Additionally, MITADER's mandate to lead the implementation of the National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC) places this ministry at the centre of the country's climate change response, with the responsibility to work in alignment with a various governmental and non-governmental stakeholders. MITADER is also responsible for reporting requirements under the UNFCCC and other international conventions. Box 1 refers to specific roles and responsibilities to be addressed by MITADER within the climate change reporting framework.

Box 2: Responsibilities of MITADER related to the national MRV system

- *Coordinate the existent Group Inter-Institutional for Climate Change (GIIMC) responsible for implementation of climate change issues within the country;*
- *Serve as the Secretariat of the GIIMC;*
- *Coordinate the thematic technical working groups such as energy including transport working group, Agriculture, Forestry and Other Land Use (AFOLU), waste working group, and industrial processes working group, responsibly for the preparation and implementation of climate change policies, strategies, plans, programs and actions and for the national and international MRV and transparency systems (preparation of the national GHG reports, National Communications - NCs, Biennial Update Reporting - BURs, NDC including its NDC Operational Plan, National Adaptation Plan – NAP and soon the Biennial Transparency Reporting – BTRs);*

- Appoint the project coordinator for the preparation of each of the above mentioned report to be submitted to the UNFCCC;
- Sign Memorandums of Understandings (MOUs) including information sharing protocol with relevant government institutions that coordinate thematic areas. The MOUs establish an institutional arrangement so that Mozambique can gather information necessary for complying with the international MRV requirements;
- Mobilize bilateral and multilateral funds including other sources of funds to implement climate change actions including to comply with national and international MRV and transparency system;
- Submit financial, progress and other reports to the climate funds and other institutions that provided funds for preparation of the national climate change reports and documents as required;
- Mobilize technical assistance from the academies (such as University Eduardo Mondlane, under the MOU signed with this institution) for the preparation of climate change reports and documents;
- Designate the technician to represent DINAB in all thematic technical working groups;
- Formulate and implement procedures for quality assurance, quality control and verification in all stages of the preparation of the reports (NCs, BUR, BTR and National GHG Reports) for high quality;
- Compile the reports (NCs, BUR, BTR, National GHG Inventory Reports, etc.) and other documents (NDC, NAP, policies, strategies, plan and programs);
- Circulate the compiled reports and documents for comments;
- Hold national meetings, whenever is required, to validate the compiled report;
- Submit reports prepared for approval by the Council of Ministers and subsequently to the Convention (BUR, National Communications, NDC, BTR, etc.);
- Maintain database of the activity data and information used in the preparation of the reports and documents including those reports and documents; and,
- Disseminate the reports and documents.

The multiple responsibilities and mandates of MITADER are enacted by its multiple directorates and departments, notably the National Directorate for Environment (DINAB), the National Directorate for Forestry (DINAF), and the National Directorate for Planning and International Cooperation (DPCI). In addition to the “line” directorates, MITADER’s activities are further supported by subordinate institutions such as the National Fund for Sustainable Development (FNDS) to promote and finance programs and projects to ensure sustainable, harmonious and inclusive development. Table 1 presents detailed roles and responsibilities of key directorates and entities participating in MRV within the MITADER.

Table 1: Key institutions within MITADER related to national MRV in Mozambique

MITADER	Institution role and responsibilities to MRV	Type of MRV
National Directorate of Forestry	<ul style="list-style-type: none"> • Quantitatively and qualitatively assess forest resources as well as reducing emissions from deforestation and forest degradation • Ensure the licensing, management, protection, research, conservation, monitoring and monitoring of forest resource use. 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>



National Directorate of Environment (DINAB)	<ul style="list-style-type: none"> • Provide technical assistance to all levels of environmental governance • Establish standards, guidelines and procedures for the preparation of environmental management plans for socio-economic development projects. • Coordinate the implement of bilateral and multilateral agreements including on climate change convention • Co-coordinate the implementation of Agenda 2030 • Develop environmental management system 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>
National Directorate of Land	<ul style="list-style-type: none"> • Globalize land use information • Oversee the exploration plans proposed by the land use and benefit holders 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>
National Directorate of Territorial Planning and Resettlement	<ul style="list-style-type: none"> • Monitor the implementation of territorial management instruments • Evaluate, monitor and promote good practices related to territorial management in communities. • Develop, coordinate and manage the national territorial information system 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>
Planning and Cooperation Directorate	<ul style="list-style-type: none"> • Lead and control the process of collecting, processing, analysing and inferring statistical information. • Monitor and evaluate the implementation of policies, programs and projects. • Ensure the creation and maintenance of a database for environmental statistics purposes. • Monitor the implementation of cooperation programs, projects and actions. • Evaluate the results of regional and international cooperation projects and / or programs. • Monitor the implementation of activities arising from bilateral and multilateral agreements. • Develop and maintain a database on all cooperation programs. 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p> <p>MRV of support</p>
National Fund for Sustainable Development (FNDS)	<ul style="list-style-type: none"> • Mobilize, generate and manage financial resources by applying them to actions leading to sustainable development • Fund programs for environmental management, climate change adaptation and mitigation, sustainable forest management, biodiversity conservation, land management and land use planning; • Mobilize resources bilaterally and multilaterally for the implementation of sustainable development activities; • Manage the financial resources of the Conventions in the areas of environment, land, forests, conservation and others that may prove relevant to sustainable development (as GEF Operational Focal Point). 	<p>MRV of support</p>

4.1.3.2 Ministry of Economy and Finance (MEF)

The Ministry of Economy and Finance (MEF) is responsible for managing national development and is the focal point for management of external finance and related projects. In addition, the National Directorate for Monitoring and Evaluation within MEF is the National Designated Authority (NDA) for Mozambique's communications with the Green Climate Fund (GCF) and is therefore anticipated to play an important role in applying for and managing external finance to support climate change-related initiatives through the GCF.

Although the MEF does not have a long record of leadership on Mozambique's climate change response, the former Ministry of Planning and Development (MPD), which preceded the current ministry leaders, was instrumental in facilitating the consideration of climate change in the country's revised institutional and policy frameworks. MEF can use this past experience to continue supporting the country, especially on the components of MRV for financial support needed and received. Furthermore, MEF can play an important role on resource mobilization because of hosting the focal point for the GCF.

The MEF has played an important institutional role in the formulation and financing of the Development of Policy and Operation (DPO) projects and as a result, has become an important stakeholder in national-level projects focused on climate change, despite not playing a major role in the implementation of field-level activities. Through the DPO projects, several policies on climate change have been approved, including the National System for Monitoring and Evaluation of climate change (SNMAMC). MEF is also a repository of the Economic and Social Plans (PES). These plans incorporate information on Adaptation and Mitigation that can be used to report climate change. The roles and responsibilities of MEF in climate change reporting are summarized in Box 2.

Box 3: Responsibilities of MEF related to the national MRV system

- Co-coordinate with MITADER the implementation of the agenda 2030;
- Represent the country in international financial and economic institutions and organizations (for example as NDA for GCF)
- Prepare the annual Social and Economic Plan (PES) based on the information received from other ministries and present to the Council of Ministers for endorsement before it is submitted to the parliament for approval;
- Monitor and evaluate the PES implementation
- Compile the PES balance based on the information provided by other ministries in regards to PES implementation and present to the Council of Ministries for endorsement before its approval by the parliament

Within MEF, three institutions are relevant for the MRV. The National Treasury Directorate for its role in managing the funds and its importance in contributing to the MRV of support; the National Directorate of Monitoring and Evaluation, for its role on compilation of the PES; and the Cooperation Directorate, for its role in elaboration of the projects including climate change projects. Table 2 illustrates the detailed roles and responsibilities of key directorate and INE within MEF relevant for MRV System.

Table 2: Key institutions related to CC MRV in Mozambique

MEF	Institution role and responsibilities to MRV	Type of MRV
National Treasury Directorate	<ul style="list-style-type: none"> Register external finance and disseminate their reports 	MRV of support
National Directorate of Monitoring and Evaluation	<ul style="list-style-type: none"> Assess the effectiveness of sectorial policies and strategies with support of the MEF focal point for NDC; Undertake monitoring and evaluation activities at all levels of the implementation of short, medium- and long-term plans; Lead the process of monitoring and evaluation of partner-funded projects implemented in the various sectors. 	MRV of mitigation actions MRV of support
Cooperation Directorate	<ul style="list-style-type: none"> Collect and update information on external financing projects. Maintain updated external financing database 	MRV of support

4.1.3.3 Ministry of Mineral Resources and Energy (MIREME)

The MIREME is responsible of coordinating of ensuring the implementation of the government's policy in geological research, exploration of mineral and energy resources, and development and expansion of infrastructure for the supply of electricity, natural gas and petroleum products.

The diverse responsibilities and mandates of MIREME within the MRV system are undertaken and supported by several directorates composed by representatives of National Directorates of Energy, Geology and Mines, Fuels and Hydrocarbons and Planning and Cooperation, National Energy Fund, National Hydrocarbon Company. Box 3 below presents the responsibilities of MIREME for the MRV of climate change.

Box 4: Responsibilities of MIREME related to the national MRV system

- Coordinate the energy technical working group composed of representatives of MIREME (National Directorates of Energy, Geology and Mines, Fuels and Hydrocarbons and Planning and Cooperation, National Energy Fund, National Hydrocarbon Company), Ministry of Transport and Communications (National Directorate Transport and Logistics, National Land Transport Institute, National Sea Institute, National Civil Aviation Institute, Ports of Mozambique Company and Mozambique Airports Company), Ministry of Industry and Commerce (National Directorate of Industry), MITADER (Directorate Environment (DINAB), National Statistics Institute, EDM, PETROMOC and other entities deemed relevant;
- To appoint the energy technical working group coordinator and other technicians to be part of this group, which is responsible for conducting studies related to the energy sector, such as identification of mitigation options and their effects and support needs and vulnerability and adaptation assessment, to be include in the documents (NDC, policies, strategies, plan, programs, etc.) and reports (NCs, BURs, BTR, etc.);
- Mobilize additional funds and other support and partnerships for MRV and transparency system and implementation of adaptation and mitigations actions in the energy sectors including transport;
- Promote the implementation of energy adaptation and mitigations actions through integration of those actions into annual PES especially the actions that are included in the NDC;
- Report to MITADER through DINAB the studies done, the progress achieved in implementing NDC and other adaptation and mitigation actions including support received and challenges
- Participate in the preparation of national GHG inventory report which includes, but not limited to data collections and analyses, selection of methodologies, definition of assumptions and preparation and validation of the GHG national reports and improvement plan;

- Provide data activities and information necessary for the preparation of documents (NDC, policies, strategies, plans and programs) and reports (NCs, BUR, BTR, etc.) to be submitted to the Council of Ministers and to the UNFCCC;
- Participate and provide information necessary for the process of consultation and international analysis of documents submitted to the UNFCCC (such as the BUR) as well as for the facilitation of the sharing of views;
- Permanently document the steps described above in order to allow re-estimation of future emissions; and
- Identify areas that require improvement in the next report.

Under MIREME, four institutions are relevant to the MRV system of climate change because of the data they are able to gather and report on mitigation actions. The subordinated institutions described in table 3 further support the activities on MRV of MIREME.

Table 3: Institutions related to MRV under MIREME

Institution	Activities related to climate change	Contributor to which MRV
General Inspectorate of Mineral Resources and Energy	<ul style="list-style-type: none"> • Inspect and audit facilities for the production, transport, distribution and marketing of electricity, hydrocarbons and fuel, including fuel storage and discharge facilities; • Organize and carry out inspections, investigations, investigations and audits of different activities related to the Mineral Resources and Energy sector. 	MRV of Mitigation actions
National Directorate of Geology and Mines	<ul style="list-style-type: none"> • Plan, coordinate, control and ensure the inventory of the country's mineral resources, including on the continental shelf and in the Exclusive Economic Zone. • Manage mining data and geological information and keep updated the respective geological inventory and mineral reserves of the country; • Coordinate and monitor mining geological activities carried out by public and private entities; • Ensure the promotion and monitoring of artisanal and small-scale mining. 	MRV of GHG Emissions MRV of mitigation actions
National Directorate of Energy	<ul style="list-style-type: none"> • Conduct studies on the development and sustainable use of energy resources, including their mapping and updating. • Licensing energy facilities, natural and legal persons responsible for the preparation and operation of energy projects and keeping their registration updated • Evaluate, monitor and propose the certification of energy technologies, in coordination with the competent entities, in order to comply with the quality, safety, health and environmental standards in force in the country 	MRV of GHG emissions MRV of mitigation actions MRV of support needed and received
Planning and Co-operation Directorate	<ul style="list-style-type: none"> • Monitor the execution of sector investments 	MRV of support needed and received
	<ul style="list-style-type: none"> • Organize and keep up to date statistical information on the mineral resources, fuel and energy sector, and disseminate information of interest to the sector; 	MRV of GHG emissions MRV of mitigation actions

4.1.3.4 Ministry of Transport and Communications

The Ministry of Transport and Communications leads the process of transport and communication and is composed by the following subsectors: (a) Ports; (b) Railways; (c) Merchant Marine; (d) Road Transport; (e) Civil Aeronautics; (f) Post mail and Telecommunications. MTC covers the National Directorate of Transport and Logistics, National Institute of Land Transport, National Institute of Sea, National Institute of Civil Aviation, Mozambican Ports Enterprise and Mozambique Airports Company. The roles and responsibilities of MTC are linked with those of MIREME and these two institutions are in the same working group for the analysis of MRV for mitigation and for the MRV for GHG. Box 4 presents the roles and responsibilities of MTC into the MRV.

Box 5: Responsibilities of MTC related to the national MRV system

- Participate in the energy working group, appointing representatives from National Directorate Transport and Logistics, National Land Transport Institute, National Sea Institute, National Civil Aviation Institute, Ports of Mozambique Company and Mozambique Airports Company;
- Mobilize additional funds and partnerships for reporting and documents;
- Plan the activities to be performed;
- Request payment of the resources allocated to the planned activities;
- Report to MITADER through DINAB the progress of planned activities so that this information can be included in progress and financial reports to be submitted to the Implementing Agency of the Global Environment Fund (GEF) assisting the country in drafting the documents;
- Provide data and information necessary for the preparation of documents to be submitted to the Council of Ministers and to the UNFCCC;
- Participate in the process of selection of methodologies, definition of assumptions and preparation of reports;
- Comment and validate reports prepared with stakeholders;
- Participate and provide information necessary for the process of consultation and international analysis of documents submitted to the UNFCCC (such as the BUR) as well as for the facilitation of the sharing of views;
- Permanently document the steps described above in order to allow re-estimation of future emissions; and
- Identify areas that require improvement in the next report.

Two sector departments are relevant for the MRV for climate change, as table 4 shows. These are the National Directorate of Transport and Security, and the National Directorate of Logistics for its role in data collection and the Directorate of Economics and Investments for its role in gathering new investments in climate change.

Table 4: MTC -Ministry of Transport and Communications

Institution	Activities related to climate change	Contributor to which MRV
National Directorate of Transport and Security	<ul style="list-style-type: none"> • Instruct and oversee transportation licensing processes 	MRV of GHG emissions MRV of mitigation actions

Institution	Activities related to climate change	Contributor to which MRV
National Directorate of Logistics and Private Sector Development	<ul style="list-style-type: none"> Conduct policy analysis, monitoring and evaluation 	MRV of mitigation actions
Directorate of Economics and Investments	<ul style="list-style-type: none"> Develop and monitor the implementation of transport sector development programs and projects. Direct and control the process of collecting, processing, analysing and inferring the statistical and economic information of the sector. Conduct sector policy analysis, monitoring and evaluation Monitor and evaluate the execution of investment projects. 	MRV of GHG emissions MRV of mitigation actions MRV of support

4.1.3.5 Ministry of Agriculture and Food Security (MASA)

The MASA is mandated to establish policies, regulations and strategies to ensure food and nutritional security of the population. In addition, the ministry is responsible for production and publication of official agricultural statistics in its various directorates and agencies (such as the Annual National Agricultural Survey-IAI). However, some statistical programs are jointly organized and conducted by the National Institute of Statistics of Mozambique (INE) and MASA (INE, 2016).

As a result of the cross-cutting nature of the agriculture sector, the implementation of MASA's policy framework is based on an approach of inter-sectoral coordination between the agriculture sector, energy for agriculture, transport for agriculture, forest for agriculture, processing of agriculture products, regarding the formulation, monitoring, evaluation and implementation of policy actions to reduce climate change impact for the sector.

The diverse responsibilities and mandates of MASA are enabled by several directorates and departments, including inter alia Inspectorate-General for Agriculture and Food Security; National Directorates for Agriculture and Silviculture; National Directorate for Veterinary; National Directorate for Agricultural Extension; Directorate for Documentation of Agrarian Information; and Directorate for Planning and International Cooperation. In addition to the abovementioned line directorates, MASA's activities are further supported by subordinated institutions for research and development activities (notably the National Institute for Agricultural Research of Mozambique (IIAM) and dedicated facilities for development of cotton and cashew crops) and sponsored institutions such as Agrarian Development Fund (FDA); National Institute of Irrigation (INIR); Technical Secretariat for Food and Nutritional Security (SETSAN).

In terms of climate change priorities, MASA's activities are aligned with cross-cutting national policy instruments such as the ENAMMC strategy and the SNMAMC monitoring framework (which includes multiple objective indicators for adaptation in the agriculture sector) and the sectoral priorities outlined in the draft Action Plan for Climate Smart Agriculture.

Box 6: Responsibilities of MASA related to the national MRV system

- Co-coordinate with MITADER, the Agriculture, Forestry and Land Use Group (AFOLU), composed of representatives from MASA (Directorate of International Planning and Cooperation, National Directorate of Agriculture and Forestry, National Directorate of Agricultural Extension, Directorate National Veterinary Organization, National Institute of Irrigation and Institute for Agricultural Research of Mozambique), MITADER (National Directorate of Environment - DINAB, National Directorate of Forests, National Directorate of Territorial Planning and Resettlement, CENACARTA and UTREDD), National Institute of Statistics and other entities deemed relevant;
- Appoint the AFOLU Group Co-coordinator and other technicians to be part of this group;
- Mobilize additional funds and partnerships for the preparation of reports and documents;
- Plan the activities to be carried out;
- Request payment of the resources allocated to the planned activities;
- Report to MITADER through DINAB the progress of planned activities so that this information may be included in the progress and financial reports to be submitted to the Global Environment Fund Implementing Agency assisting the country in drafting the documents;
- Provide data and information necessary for the preparation of documents to be submitted to the Council of Ministers and to the Convention;
- Participate in the process of selection of methodologies, definition of assumptions and preparation of reports; validate reports to stakeholders;
- Participate and provide information necessary for the process of international consultation and analysis of documents submitted to the Convention (such as the BUR) as well as for the facilitation of the sharing of views;
- Permanently document the steps described above in order to allow re-estimation of future emissions; and
- Identify areas that require improvement in the next report.

The directorates relevant for MRV of climate change are the following. The Directorate of Agriculture and Directorate of Veterinary, for data collection; the National Directorate of Planning, for statistics gathering; and the department of finance and administration, for its information gathering for MRV for financial support. The subordinated institutions described in table 5 further support the activities on MRV of MASA.

Table 5: MASA - Ministry of Agriculture and Food Security

Institution	Activities related to climate change	Contributor to which MRV
National Directorate of Agriculture	<ul style="list-style-type: none"> • Ensure the design, implementation, monitoring and evaluation of policies, strategies and specific legislation on agriculture and forestry. • Oversee and inspect commercial seed, fertilizer and pesticide networks • Lead data collection, processing and analysis to generate information about the course of the agrarian campaign. 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>
National Directorate of Veterinary	<ul style="list-style-type: none"> • Ensure the preparation, implementation, monitoring, evaluation of policies, strategies and legislation of the livestock subsector and veterinary area. • Collect, process and analyse data for the generation of livestock information and disseminate it. 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>
National Directorate of Planning and Co-operation	<ul style="list-style-type: none"> • Identify, formulate, monitor and evaluate the guidelines, policies, strategies, programs, plans and projects of the agrarian sector and advise on their technical and economic viability; 	<p>MRV of GHG emissions</p>

	<ul style="list-style-type: none"> Assess the effects of national and international macroeconomic policy on agricultural production and propose actions for the Produce and disseminate statistics to assess the performance of the agrarian sector; Produce evidence-based sector analytical information for decision making 	MRV of mitigation actions
	<ul style="list-style-type: none"> Explore and disseminate in the sector the technical, material and financial potential of cooperation 	MRV of support
Department of Administration and Finance	<ul style="list-style-type: none"> Monitor the execution of funds allocated to projects at Ministry level and report to stakeholders 	MRV of support

4.1.3.6 Ministry of Industry and Commerce (MIC)

The MIC has the primary responsibility for all matters related to ensuring the formulation, elaboration and implementation of sectoral policies and strategies to promote the growth of industrial production, trade, agricultural marketing and exports. MIC has a function of guaranteeing the statistics for the industry sector (food industry, mineral industry, beverage industry, metal industry, among others) by providing the quantities of produce, the raw material used for the fabrication of goods.

Box 7: Responsibilities of MIC related to the national MRV system

- Coordinate the Industrial Processes and Use of Product Group composed of representatives of the MIC (National Directorate of Industry), MIREME (National Directorate of Energy and National Directorate of Hydrocarbons and Fuels), MITADER (National Directorate of Environment - DINAB), Forum Business for the Environment, CTA, National Institute of Statistics, Large Industries / Associations (Mozal, Cement, Quarry, Sugar, etc.) and other entities deemed relevant;
- Appoint the Coordinator of the Industrial Processes and Use of Products Group and other technicians to be part of this Group;
- Mobilize additional funds and partnerships for reporting and documents;
- Plan the activities to be performed;
- Request payment of the resources allocated to the planned activities;
- Report to MITADER through DINAB the progress of planned activities so that this information can be included in progress and financial reports to be submitted to the Implementing Agency of the Global Environment Fund assisting the country in drafting the documents;
- Provide data and information necessary for the preparation of documents to be submitted to the Council of Ministers and to the Convention;
- Participate in the process of selection of methodologies, definition of assumptions and preparation of reports;
- Validate reports prepared with stakeholders;
- Participate and provide information necessary for the process of consultation and international analysis of documents submitted to the Convention (such as the BUR) as well as for the facilitation of the sharing of views;
- Permanently document the steps described above in order to allow re-estimation of future emissions; and
- Identify areas that require improvement in the next report.

Within MIC, only the National Directorate of Industry is relevant for the MRV because of the ability to collect information about the number, quantity, type of material used in industrial production. The MRV for MIC is described in table 6 below.

Table 6: MIC - Ministry of Industry and Commerce

Institution	Activities related to climate change	Contributor to which MRV
National Directorate of Industry	<ul style="list-style-type: none"> Manage and control all the industries and make a record of their raw material usage and production. 	MRV of GHG emissions MRV of mitigation actions

4.1.3.7 Ministry of Health (MISAU)

The MISAU is responsible for the implementation of the public and community health programme and for the development and supervision of policies for the private health system throughout Mozambique. Through its National Directorate of Planning, the Department of Environment Management is the lead sector for the environment working group within the health sector. MISAU provides information on the incineration of the hospital waste, MOPHRH and the municipalities provide information regarding the human waste management.

Box 8: Responsibilities of MISAU related to the national MRV system

<ul style="list-style-type: none"> Co-ordinate the Waste Group composed of representatives of MIREME, MASA, MISAU, MITADER, MOPHRH, Municipalities Association and other entities deemed relevant; Appoint the Coordinator of the Waste Group and other technicians to be part of this Group; Mobilize additional funds and partnerships for the preparation of reports and documents; Plan the activities to be carried out; Report to MITADER through DINAB the progress of planned activities so that this information may be included in the progress and financial reports to be submitted to the Global Environment Fund Implementing Agency assisting the country in drafting the documents; Provide data and information necessary for the preparation of the documents to be submitted to the Council of Ministers and to the Convention; Participate in the process of selection of methodologies, definition of assumptions and preparation of reports; Validate reports prepared with stakeholders; Participate and provide information necessary for the process of international consultation and review of documents submitted to the Convention (such as the BUR) as well as for the facilitation of the sharing of views; Permanently document the steps described above in order to allow re-estimation of future emissions

MISAU will lead the group through the Directorate of Cooperation, which will collect information from other sectors. The MISAU's activities on MRV are further supported by the institution described in table 7 below.

Table 7: MISAU - Ministry of Health

Institution	Activities related to climate change	Contributor to which MRV
National Directorate of Planning and Cooperation	<ul style="list-style-type: none"> Lead and control the process of collecting, processing, analysing and inferring statistical information about the health sector 	MRV of GHG emissions

4.1.3.8 Ministry of Public Works, Housing and Water Resources (MOPHRH)

The MOPHRH mandate is to promote, build and preserve infrastructure that drives socio-economic development, using resources available sustainably for the planning and coordinated implementation of public water management programs, development of construction industry, public buildings and the road network, access to clean water, sanitation and decent housing. Under the MRV of Adaptation, MOPHRH will provide information about infrastructure development, and access to water and sanitation.

Box 9: Responsibilities of MOPHRH related to the national MRV system

- Co-ordinate the waste working group composed of representatives of MIREME, MASA, MISAU, MITADER, Mozambique Municipalities Association (ANAMM) and other entities deemed relevant through leadership of the data collection and reporting frameworks for the waste sector;
- Appoint the coordinator of the waste group and other technicians to be part of this group;
- Mobilize additional funds and partnerships for the preparation of reports and documents;
- Plan the activities to be carried out;
- Request payment of the resources allocated to the planned activities;
- Report to MITADER through DINAB the progress of planned activities so that this information may be included in the progress and financial reports to be submitted to the Global Environment Fund Implementing Agency assisting the country in drafting the documents;
- Provide data and information necessary for the preparation of the documents to be submitted to the council of Ministers and to the UNFCCC;
- Participate in the process of selection of methodologies, definition of assumptions and preparation of reports;
- Validate reports prepared with stakeholders;
- Participate and provide information necessary for the process of international consultation and review of documents submitted to the UNFCCC (such as the BUR) as well as for the facilitation of the sharing of views;
- Permanently document the steps described above in order to allow re-estimation of future emissions; and
- Identify areas that require improvement in the next report

The National Directorate of Water Supply and Sanitation and the National Directorate of Water Resources Management will contribute to the national MRV system through their data collection and reporting (table 8 below).

Table 8: Ministry of Public Works, Housing and Water Resources

Institution	Activities related to climate change	Contributor to which MRV
National Directorate of Water Supply and Sanitation	<ul style="list-style-type: none"> • Establish and operate national water and sanitation information systems • Monitor compliance with domestic and industrial pollution prevention standards 	<p>MRV of GHG emissions</p> <p>MRV of mitigation actions</p>
National Directorate of Water Resources Management	<ul style="list-style-type: none"> • Ensure oversight and enforcement of resource law and regulatory framework for water resources management 	MRV of mitigation actions

4.1.3.9 The Academy of Science of Mozambique

The Academy of Science of Mozambique (ACM) is an entity that brings together scholars, scientists and innovators, committed to the production and dissemination of science and technology, as well as the mobilization of the community for the development of the country as a whole. The Academy of Science is under the tutelage of the Ministry of Science, Technology, Higher Education, and Vocational Studies (MCTESTP). The main objectives of the ACM:

- Contribute to the development of science and technology in Mozambique;
- Disseminate to national and foreign scientific advances;
- To honour the scientific research of excellence done in the country;
- Raise the professional ethics and social appreciation of national scientists;
- Strengthen scientists' links with each other, with society and with the rest of the world.

The ACM is a virtual institution composed by the university lectures of various academic professionals of various backgrounds, that are not directly linked with the academy on day to day basis but are requested when there is a need. The ACM has a secretariat with supporting staff and lecturers that work on virtual basis. The ACM can support MITADER through proofreading of the documents produced (BUR, BTR, NDC, GHG, NC, etc.). With various specialists that are part of the academy of science, it is possible to have ACM performing specific studies to fulfil gaps in knowledge and data availability.

4.1.3.10 National Fund for Sustainable Development

The National Fund for Sustainable Development (FNDS) is a legal entity governed by public law, with legal personality and capacity, administrative, financial and patrimonial autonomy, under the supervision of the Minister responsible for the Land, Environment and Rural Development (MITADER). The FNDS was created to respond to the global need to adopt sustainable development models that are able to host and manage multilateral financing funds, and other funds from the United Nations. The FNDS will contribute with information on the financial support received once it is approved as a repository of funds by the GCF.

4.1.3.11 National Institute of Statistics

The INE is an institution with mandate to collect manage and report information. With support of the law 9/96 (*Sistema Estatístico Nacional*), INE can conduct surveys with mandatory responses, and can request statistical data to any data production unit. INE can play an active role in MRV of climate change through data collection and dissemination. INE is supervised by the Council of Ministers and has higher capacity to collect information on annual basis such as statistical yearbooks, which can include environment data, census and other on demand studies.

4.1.3.12 Council of Ministers

The Council of Ministers has the mandate to appreciate the documents submitted by MITA-DER prior to submission. The role of the Council of Ministers is very important to ensure that relevant information is analysed prior to its submission to international institutions. This role will continue under the future structure in order to make sure that the government approves the reports about instrument (NC, BUR, BTR). Following appreciation and approval of the document, it is sent to the institution accommodating the focal point of UNFCCC for formal submission.

4.2 Recommendations for the legal setup

Under the legislation, there is a need to revitalize the coordinating institution for climate change, the National Council for Sustainable Development (CONDES) and its function of coordination of climate change. This will ensure that climate change agenda should be taken to the level of ministers to improve the level of authority and accountability. Furthermore, one of the most important gaps to be addressed is the formalisation of the mandate of GIIMC and the effective functioning of the national technical working groups. The formalisation of GIIMC as an entity mandated with coordination and information sharing will reduce the risk of overlapping mandates and duplication of activities between national-level stakeholders.

In addition, a law must be developed to improve the data sharing. Currently there is challenge in terms of data sharing between and among public and private institutions. Climate change has benefitted several policy instruments and protocols for planning and operationalization, however enforcement is still weak and the proposed climate change law will fill the gap existent in data production, sharing and reporting.

The first step taken was the inclusion of the reporting need into the formal documents. For instance: the SNMAMC mandates annual reporting to climate change. The country's NDC includes a chapter on reporting and strengthens the need for annual reporting from sectors. However, the recommendations from these documents do not have legal mandate and remains within the documents only.

The second step taken by the country to operationalize the reporting need is the development of the protocols. MITADER already engaged in development of protocols for information sharing. For instance, a protocol was signed between MITADER and University Eduardo Mondlane on climate change support in reporting. A draft protocol (MoU) was submitted to MISAU, MIREME, MOPHRH, MIREME, MIC, MASA for provision of information for GHG reporting. However, these latter protocols have not been signed, despite being submitted long time ago. Moreover, there is no guarantee about the operationalization of the protocols, because their utilization is not mandatory and rely on the level of interest of the sector leader.

The third step needed is the establishment of a climate change law. The establishment of a law solves the issues of willingness because it is compulsory to apply to law regarding of the willingness to do so. Furthermore, the law has stronger importance because it is not only dependent on the institution related to the law, but also with the legislators (in this case, the deputies of the assembly of the republic). This type of instrument is more complex to develop and requires time. Given the level of efficiency and effectiveness required on climate change and based on the past experience of the country, it is recommended the development of a climate change law. This law will align with the country's ambitions and international commitments to reduce vulnerability to climate change and support low-carbon development initiatives. The main components of the law are presented in box 10 below.

Box 10: Proposal for a law for institutionalization of climate change reporting

Rational: MITADER is backed by the environment law (lei 20/1997) for several of its activities namely: prohibition to pollute the land, protection of environmental heritage, and environmental audits). However, the environment law is silent on reporting climate change impact and greenhouse gas emissions, and sectors do not have obligation to report on periodical basis to MITADER.

Under the proposed law for institutionalization of climate change reporting, sectors related to climate change will be requested to provide information on regular basis to MITADER. This law will describe the institutional arrangement including the responsibility of the different actors in collection, sharing and preparation of a National Climate Change Annual Report (the SNMAMC document) and international documents (National Communication, Biennial Update Report, Biennial Transparency Report, Nationally Determined Contribution), and other documents that the UNFCCC will adopt, and define the timeframes for collecting and sending data. The law will also describe the procedures and methodologies to follow in preparing the information, taking into account the guidelines adopted by the UNFCCC. The law will have the necessary penalties for institutions not complying with data sharing instructions.

Justification: This law will institutionalize the preparation and submission of climate related documents, enabling the country to comply with international reporting commitments within the framework of transparency on climate change. At the national level, this law will contribute to the generation of relevant information on climate change to support the process of decision-making on priorities for adaptation, mitigation and required support including the creation of technical and institutional capacity.

Problems to be solved: lack of legally established institutional arrangements, resulting in the different institutions failing in their responsibilities of preparing and submitting data and implementation of the NDC.

Operationalization of the law: This law will be operationalized through two main instruments

- Requirement to report specific data. Sectors will be required to provide data that will be used for the different types of MRV
- Requirement of MITADER to submit climate change information to the Council of Ministries on a regular basis and to the Assembly of the Republic on five-year basis

Immediate needs: (i) capacity building on complying with the UNFCCC guidelines for transparency and international reporting, (ii) design of data collection sheets and engagement of non-state actors

Lead institution: This law will be coordinated by the Ministry of Land, Environment and rural Development (MITADER) at the National Directorate of Environment (DINAB).

Challenges: The change in institution names and mandates in result of elections might affect the capacity and the mandate to perform certain demands previously established to be executed by the institutions. The formulation of the law needs to accommodate potential future changes in the names and mandates of ministries.

4.3 Recommendations for the procedural setup

The procedural setup of the MRV system for climate change is presented in this section. In terms of categories, the future MRV system needs to address all categories of MRV namely: MRV of greenhouse gas emissions, MRV of mitigation, M&E (monitor and evaluation) of climate change impacts and adaptation, and MRV of support received and needed.

The MRV of greenhouse gas emissions will be done through the National Inventory System of Greenhouse Gas (SNIGEE), which will provide the necessary data for the elaboration of the GHG inventory reports included in the national communications, biennial update report, SNMAMC, and other reports. The SNIGEE will include collection, analysis and monitoring of activity data used in inventories (for example, amount of fuel used by the power generation industry, amount of fuel used by the power generation industry for its own consumption, amount of natural gas consumption in the energy sector, fuel used for transport, amount of caustic soda produced and consumed, amount of clinker produced and consumed by cement plants, etc.)

The MRV of mitigation actions will consider the indicators for the emission reduction targets in the NDC⁵ and the indicators that will measure the reductions of emissions resulting from the actions in the NDC operational plan and NAMAs. It could include, for example, quantity of vehicles powered by natural gas, quantity of environmentally friendly stoves produced and sold, quantity of charcoal using improved furnaces, reforested areas (ha), number of livestock farmers with systems for treatment / recovery of animal waste, and the associated reductions in GHG emissions. Moreover, the MRV of mitigation will also track the mitigation co-benefits resulting from adaptation measures. For example, the NAMA for vegetable coal production might create jobs.

The M&E of climate change impacts and adaptation actions will check what measures are in the NDC and if the indicators defined in SNMAMC can track progress on these measures. Another issue is that adaptation measures have mitigation co-benefits. For example, mangrove regeneration will increase CO₂ removal and temporary storage capacity; use of renewable energies in pumping water for irrigation, agroforestry systems, use of methane from rice cultivation, etc. This system should include indicators that will help to track the impacts resulting from the occurrence of extreme events including their magnitude. That is, for the extreme events occurred what is the magnitude and losses resulting from these events (loss of life, lost agricultural areas (ha), destroyed infrastructure, estimated cost of loss and estimated cost for reconstruction and value achieved from both government and partners for rebuilding).

Regarding the MRV of the support received and required, the national MRV system will take into account the enhanced transparency framework that recommends that countries report on financial support, technology development and transfer, and capacity-building needed and received. Therefore, the MRV of financial support needed will include indicators that will help to track support (bilateral and multilateral, public, etc) to implement climate change actions.

⁵ The detailed information can be found in the country's NDC, which has set a target of reduction of GHG of about 30 MtCO₂ eq between 2020 and 2025.

This should include, for example, the nature of support (donation, loan, credit, grants, etc.), the implementation area (adaptation, mitigation, development and transfer of technology or training), the sector (agriculture, water resources, early warning, energy, etc.), and the stage (ongoing, planned, completed), of climate actions.

At the end of every year (except for the inventories) sectors will be required to produce information and make it available to the public. Some information regarded as confidential will be kept confidential and will be provided to specific sectors based on Mozambique law of supply of confidential information. MITADER will make use of the information to produce the GHG inventories per sector based on the data available. MITADER will send information to the specific sector for verification before publishing to the public. Once the information is finalized, MITADER will estimate the level of GHG and use the information to produce formal national (the SNMAMC) and international documents (NC, BUR, BTR, NDC) among other needed documents. Table 9 below shows the institutional setup per type of MRV per sector.

Table 9: Roles and Responsibilities in the national MRV system

Category	Institution (Who)	Role (What)	Where (source of information)	variables	Unit of measurement	Timeline (When)
MRV OF MITIGATION AND GEE (Energy and Transport)	MIREME,	provide the following information -Electricity generation and utilization	Private sector, public sector (energy sector statistics) Website: www.mireme.gov.mz	Emissions related to electricity	GW/Year	Annual
	MTC	-transport industry: fuel consumption per type	Private sector, public (transport sector statistics), aviation Website: www.mtc.gov.mz	petrol, natural gas, JET,	TJ/year	Annual
MRV OF MITIGATION AND GEE (Industrial processes and product use)	MOPHRH	-Mineral industry Cement production and clinker	Private sector, CBO Website: www.mophrh.gov.mz	Cement and clinker (if produced internally)	Tonnes/year	Annual
	MIREME,	Mineral industry: Glass production	Private sector, Public sector Website: www.mireme.gov.mz	glass	Tonnes/year	Annual
	MIC,	-Chemical and other Process Uses of Carbonates: Ceramics and Other use of Soda Ash	Private sector, public sector Website: www.mic.gov.mz	ceramics	TJ/year	Annual
	MIC,	-Metal Industry: Iron and Steel production; Ferroalloys production, Aluminium production and zinc production	Private sector, public sector Website: www.mic.gov.mz	Steel, aluminium, zinc,	Tones/year	Annual
	MIC,	-Non-Energy Products from Fuel and Solvent Use: Lubricant use	Private sector, public sector Website: www.mic.gov.mz	Lubricants	TJ/year	Annual
	MIC,	-Products Uses as Substitute for Ozone Depleting Substances: refrigeration and air conditioning, Foam blowing Agents, Fire Protection, Aerosols	Private sector, public sector Website: www.mic.gov.mz	Quantity sold, quantity destroyed	Tones/year	Annual



Category	Institution (Who)	Role (What)	Where (source of information)	variables	Unit of measurement	Timeline (When)
	MIC,	-Other: Pulp and Paper Industry, Food and Beverages Industry,	Private sector, public sector Website: www.mic.gov.mz	Pulp and paper	Metric tones/yea	Annual
MRV OF MITIGATION AND GEE (Agriculture, Forestry and Other Land Uses)	MASA	Livestock: Enteric Fermentation and Manure Management	Private sector, public sector, statistic year-books Website: www.masa.gov.mz	Urea, manure, mud	Number of units of livestock	Annual
		Land: Forest, Cropland, Grassland, Wetlands, Settlements,	Public sector Website: www.masa.gov.mz	Forestry, cropland, uncovered soil	hectare/year	4 years
					Gg C/year	
MRV OF MITIGATION AND GEE (Waste)	MOPHRH,	Solid waste disposal: Managed waste disposal site, Unmanaged Waste disposal; and, Uncategorised waste disposal	Public sector, private sector Website: www.mophrh.gov.mz	waste	Gg/year	Annual
	MISAU	Biological treatment of solid waste	Public sector, private sector Website: www.masa.gov.mz	Waste	Gg/year	Annual
	MISAU	Wastewater treatment and disposal: Domestic wastewater treatment and discharge	Public sector, private sector Website: www.masa.gov.mz	waste water	kg BOD/year	Annual
M&E OF CLIMATE CHANGE IMPACTS AND ADAPTATION	MIREME, MASA, MITADER, MTC, MISAU, MIC, MEF, MOPHRH, MGCAS, MAEFP, MICUTUR	National circumstances, institutional arrangements and legal frameworks Impacts, risks and vulnerabilities,	ALL involved sectors	Adaptation	N/a	Annual
MRV OF SUPPORT NEEDED AND RECEIVED	ALL relevant sectors	Information on financial, technology development and transfer and capacity-building support needed and received under Articles 9–11 of the Paris Agreement	ALL	Expenditures	MZN/USD	Annual

4.4 Recommendations for improvement of data availability

At a cross-cutting level, the National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC) notes that research and systematic observation of climate change is ineffective because of the limited availability of data measurements taken at appropriate frequency and scale. This represents a significant barrier to determining the real impacts of climate change. Further, ENAMMC notes that the lack of inter-sectoral engagement in the systematic collection of data relevant to climate change, the lack of standardization, irregularity and low quality of climate data are all barriers to effective MRV.

Other important aspect is that several institutions require considerable technical and financial support to enable a strong role in the generation of data and management of information and knowledge. This will require sustained support and long-term planning. A strong capacity-building programme is needed at all levels (government institutions, private sector, non-government institutions) in order to equip the sectors with the right skills to collect, process and analyse climate change information.

The data availability is variable, depending on the sector, and based on specific circumstances. This section provides a basic assessment of data availability for all sectors, based on the needs of different national and international reports. Most sectors analysed face similar general challenges with regard to data availability. In this section, the general challenges of data availability are presented, from the perspective of MITADER, and recommendations for improvement are proposed.

4.4.1 Current status of data availability

MITADER has devoted a lot of effort to produce documents and reports on national and international forums. Currently, MITADER has the following data problems

Limited data availability for indicators about mitigation and adaptation to climate change

A rapid assessment conducted by MITADER about data availability for elaboration of the inventory of GHG emissions concluded that the majority of sectors lack information or lack information in the required format (annex 5). Although this finding requires a detailed analysis of the reasons why data is not available, it is an indication that data procedures need improvement at the sector level. With respect to the M&E of adaptation (as represented in the NDC), there are no specific indicators for the adaptation measures that are planned in the NDC.

Lack of databases

In terms of MRV of GHG emissions, there is a lack of specific databases for all the indicators that need to be measured. There is a general lack of databases for storing data necessary for the national communications (NCs), biennial update reports (BURs), and the National System for Monitoring and Evaluation of Climate Change (SNMAMC).

Lack of web-based platforms for data collection

MITADER does not have a platform for data collection and information sharing within GIIMC.

4.4.2 Recommendations for improvement of data collection

The following are immediate recommendations for improvement of data collection within MITADER:

- MITADER to share with the sectors a map of all indicators needed for production of climate change reports
- Where data is not available, MITADER needs to conduct an assessment with the sector to find out why the data is not available and how to ensure data availability. The sectors that are able to collect information will be recommended to start collecting immediately through the climate change law. For other sectors that do not have capacity to collect such information, a training will be conducted to support them to fulfil the task. Alternatively, the National Institute of Statistics will be requested to support such sector;
- MITADER should create a database with the information from the sectors for national and international reporting and make the database available for all data providers;
- MITADER to make public relevant climate change data in its website, taking into consideration the sensitivity of information classified as confidential;
- MITADER needs to engage the government to provide financing (through grant or government budget) for the sectors to collect, systematize and store the information required for climate change reports and studies.
- MITADER to develop a shared web-platform for collecting and sharing information among climate relevant sectors, to be administrated by MITADER.

5 ROADMAP FOR THE ESTABLISHMENT OF THE NATIONAL MRV SYSTEM

This section suggests concrete actions for the establishment of a national MRV system, specifically on the following areas: institutional setup; legal setup; procedural setup; and data availability.

5.1 Institutional setup

This report proposes an institutional arrangement to replace the one described in the ENAMMC (2012), which was updated in 2018 with the Plan for Operationalization of the NDC. This institutional arrangement includes institutions that had roles not clearly explicit in the former arrangements, such as INE and MEF. Under the new structure, these institutions will support the process of data collection and reporting. In this regard, INE is suggested to support with data collection and elaboration of surveys, and MEF will provide to MITADER information through the Economic and Social Plans (PES), with inputs from its financial management institutions. Under this new setup, MITADER will be responsible to produce climate change reports using information provided by the GIIMC members, who will get information from the institutions subordinated and lead by each Ministry.

The immediate actions recommended, with respect to the institutional setup, are:

- **Clarify the role of GIIMC:** MITADER will develop a Terms of Reference (ToR), in partnership with the current GIIMC members, to operationalize the new structure and clarify GIIMC's role and relevance for data collection and reporting on climate change activities in the country. The ToR should be approved by DINAB, then by CONDES, and finally by the Ministries of the GIIMC members for institutionalization and ownership.
- **Clarify the role of CONDES:** The role of CONDES needs to be updated. CONDES is an institution created by law from the Assembly of the Republic, and its termination requires that same body (Assembly of Republic) to terminate it. The government has decided to allocate the coordination of CONDES to MITADER and the secretariat to be based at the National Directorate of Environment (DINAB). However, the formal documents of transfer of the secretariat of CONDES to DINAB need to be made public to allow operationalization of this mandate. In the short run, the CONDES needs to perform its functions by having a functional secretariat properly appointed in DINAB. On an annual basis, CONDES must organize two meetings for discussion of the climate related issues, as per its statutes. This arrangement should be assessed on annual basis and, if the performance is poor, there needs to be a consideration about adjusting either the structure or the role of CONDES.
- **Develop a terms of reference for GIIMC members:** GIIMC members should be technicians from the department of statistics and planning of each ministry, with a clear overview of the respective sectoral policies and their state of implementation, and with close connection to ministerial staff involved in monitoring and evaluation, statistics, and data analysis. MITADER must inform institutions about the change in GIIMC representation and request for other appointments for cases where a representative does not fulfil the criteria. The GIIMC members must be clear in their terms of reference and

their mandate (what they can do and what they cannot do). If possible, GIIMC members can be rewarded with any form of incentive.

- **Assign the responsibility for information sharing to the ministries:** Government ministries must be the main responsible institutions to provide information for the national and international reporting. The government institutions should be advised about this role and requested the necessary information. MITADER will not track sectoral activities that are not contemplated in its mandate, but rather assign responsibility to each GIIMC member and their line ministry. Only under special circumstances (such as lack of capacity of the line ministry to collect information), MITADER will contact directly the sectors and develop a capacity-building plan for the line ministry.
- **Create requirements for reporting information in the environmental licencing process:** MITADER is the institution with mandate to provide the environmental licence for all companies in Mozambique. Since institutions are required to renew their licences on frequent basis depending on the type of institution, MITADER shall link the environment licencing unit with the reporting, to force these institutions to supply the required data for climate change reporting. The institutions that are not supplying information on climate change should not qualify for renewal of environmental license.
- **Formal approval of institutional framework:** MITADER should take appropriate actions to formally approve the suggested institutional framework proposed in this document and invest technical and financial resources to operationalize it, building on the lessons learnt with the previous institutional arrangements.

5.2 Legal setup

With respect to the legal setup, a climate change law is suggested to support the process of reporting information under the MRV framework for climate change. The proposed climate change reporting law will assure compliance by the sectors to submit the information to MITADER for fulfilment of reporting requirements. The climate change law will be specific in terms of type of information to be provided, the periodicity, responsible institutions and the possible enforcement measures.

The immediate actions proposed, with respect to the legal setup, are the following:

- **Development of indicators:** MITADER to must engage GIIMC members to support the development of a set of indicators need for reporting about climate change. Once the list is compiled, MITADER should present the list to sectors, which will determine their capacity for reporting. Besides the different levels of capacity for data provision by the institutions, MITADER should propose a date to all institutions for provision of information, at least once a year, for national and international reporting on climate change. The proposed dates will be included in a decree that identify the institutions to provide and the institutions to receive data.
- **Legalization of Terms of Reference (ToR) of GIIMC:** MITADER should develop ToR for the GIIMC and take appropriate actions for legalization of the ToR through a decree, in order to assure that other institutions will nominate GIIMC members based on a

legal instrument. The ToR will be specific in terms of roles and responsibilities of GIIMC members and will include specific roles of GIIMC institutions.

- **Development of climate change reporting law:** MITADER to create a more robust instrument (decree-law) that orients other ministries to provide information to MITADER for internal and external reporting on climate change.

5.3 Procedural setup

The current procedures for collection and sharing of information lack the mapping of the specific data to be supplied and determination of which institution will supply information and to whom. Climate change reporting must be handled at ministerial or national directorate level to ensure ownership.

The immediate actions recommended, with respect to the procedural setup, are:

- **Development of templates for data collection:** MITADER to develop templates for data collection to ensure consistency and comparability. A list of all the variables and their units will be developed and the required data will be identified. Where data is not available, sectors will be supported to produce the information and report to MITADER. The templates should include descriptive metadata, to be provided by the sectors.
- **Development of reporting schedule:** MITADER to develop reporting schedule for the institutions to provide data to MITADER and for production of information for internal consumption and international conventions. The reporting schedule must be agreed by the GIIMC member institutions. Sectors will need support and capacity-building to produce the information and report to MITADER on annual basis. In case a sector cannot deliver on time the required information, MITADER will provide assistance as to address the issue through provision of support that can also be sought from UNFCCC.
- **Implementation of measures for quality control of data:** The data provided by the institutions must allow effective quality control. MITADER will assign the DMC the task of performing quality control and quality assurance. The DMC members will be supported by the GIIMC members of specific sector.
- **Development of institutional memory:** An archive of information (with the necessary categorization of confidentiality) must be created by MITADER at the department of climate change (DMC). This information can be linked with the knowledge management centre of climate change.

5.4 Improvement of data availability

Data availability in format required to produce climate change reports is still a major concern. The situation is worsened by lack of information sharing mechanism and lack of databases for specific data related to climate change. This document concludes that institutions (especially in the sectors of energy, transport and industry) are in the most need of support to collect data compared to the sectors of agriculture, waste, forestry.

The sectors with challenges in data collection must be supported in terms of provision of instruments for data collection, supporting them financially to collect such information and capacity-building and training of technicians in the sector. An assessment must be conducted in each sector to identify specific data collection need.

The immediate actions recommended, with respect to data availability, are:

- **Line ministries to share climate change information in their websites:** Each ministry with a GIIMC member must create a climate change corner in their website and include information about climate change and other updates in their webpages. This information can be linked within and between the institutions.
- **Make the information about the implementation of environmental conventions public:** MITADER should restore the website (www.convambientais.gov.mz) and link with the ministry main page and store information about the country's progress on the implementation of environment conventions.
- **Make the information about GHG emissions and vulnerability to climate change public:** MITADER must develop GHG emission projections and make them available to the wider audience (public sector, private and public institutions, non-government organizations and donors), and encourage each sector to assess its vulnerability to climate change. This information can be made available online in the websites or in other government information sharing platforms.
- **Revitalization of the Knowledge Management Centre of Climate Change:** MCTESTP to revitalize the knowledge management centre and its webpage www.cgcmc.gov.mz and conduct studies on climate change and deliver training and knowledge sharing as per the mandate of the knowledge management centre.
- **Official production of statistics on climate change:** INE to support sectors (especially MITADER) to become accredited entities of production of formal statistics on climate change and to include some indicators (the GHG emissions per year per sector) in statistics yearbooks for environment and if possible to create a statistics yearbook on environment and climate change.
- **Training of line ministries in assessment of adaptation and mitigation actions:** MITADER must also support the sectors to guarantee that adaptation and mitigation co-benefits are accounted for. Where adaptation actions contribute to mitigation co-benefits, these must be accounted for and vice-versa. MITADER must train sectors on co-benefits and support sectors in accounting for these.

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7 ANNEXES

Annex 1 - Instrument used in consultation meetings with stakeholders

Questions for Analysis of the MRV for ICAT					
Instrument	List of institutions and Roles & responsibilities: (Primary source, co-ordinator, facilitator, legislator, mobilizer)	Needs (financial, technological, training)	What are the knowledge gaps (inability to gather data)	What are the gaps in legislation (lack of information sharing law)	What are the gaps in terms of studies (eg study about specific emission factors)
Guide question MRV for GHG MRV for Mitigation MRV for Adaptation MRV for Support needed and received	List participating sectors and describe the role they can play in the information gathering and sharing process	Indicate what needs are plaguing sectors to contribute to the efficient MRV mechanism	Is there any knowledge your sectors need for an effective MRV mechanism?	Any laws for the MRV mechanism to be efficient? If so, how would this law be described?	Do you think any study is necessary to be considered?

Annex 2- List of Interviewees

Name	Institution	Email address
Agostinho Fernando	MITADER-DINAB	agostinhofernando@yahoo.com.br
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Carla Marina Pereira	MITADER-DINAB	c_marina@ymail.com



Annex 3 - List of Institutions represented in the workshops for deliverable 3.

Date	03 rd June	04 th June	06 th June	07 th June
Group	Energy	AFOLU	Industrial processes	Solid waste
Invited Institutions	<p>MIREME</p> <ul style="list-style-type: none"> -DNE (1) -DNGM (1) -DNPC (1) <p>MTC</p> <ul style="list-style-type: none"> -DNTS (1) -INAM (1) -INAMAR (1) -IACM (1) -CFM (1) <p>INE (1)</p> <p>EDM (1)</p> <p>PETROMOC (1)</p> <p>DINAF (1)</p> <p>DINAB (1)</p> <p>FUNAE (1)</p> <p>MGC (1)</p>	<p>MASA</p> <ul style="list-style-type: none"> -DPCI (1) -INIR (1) -DINAV (1) -DINAS (1) -DINEA (1) <p>MITADER</p> <ul style="list-style-type: none"> -DINAF (1) -DINOTER (1) -FNDS (1) -ANAC (1) <p>FEMA (1)</p> <p>CTA (1)</p> <p>FAEF (1)</p> <p>WWF (1)</p> <p>UNDP (1)</p>	<p>MIC</p> <ul style="list-style-type: none"> -DPCI (1) -DNI (1) <p>MIREME</p> <ul style="list-style-type: none"> -DNE (1) -DNGM (1) <p>-Mozal (1)</p> <p>-Cimentos de Moçambique (1)</p> <p>-Açucarreira de Moçambique (1)</p> <p>-CDM (1)</p> <p>-Coca-Cola (1)</p> <p>-CTA (1)</p> <p>-FEMA (1)</p> <p>-INE (1)</p> <p>-UNIDO (1)</p> <p>MITADER (2)</p>	<p>MITADER</p> <ul style="list-style-type: none"> -DINAB-DGA (6) <p>MISAU</p> <ul style="list-style-type: none"> -DNGA (1) -MIREME (1) -MASA (1) -ANAMM(2) -Município da Matola (1) -Município de Maputo (1) -AMOR (1) -Enviroserve (1)
Nr. of participants	15	15	15	15
Full designation of invited institutions	<p>MIREME-Ministry of Mineral Resources and Energy (Ministério dos Recursos Minerais e Energia)</p> <p>DNE-National Directorate of Energy (Direcção Nacional de Energia)</p> <p>DNGM –National Directorate of Geology and mining (Direcção Nacional de Geologia e Minas)</p> <p>DNPC-National Directorate of Planning and Cooperation (Direcção Nacional de Planificação e Cooperação)</p> <p>MTC-Ministry of Transport and Communication (Ministério dos Transportes e Comunicações)</p> <p>DNTS-National Directorate of Transport and Logistics (Direcção Nacional de Transportes de Superfície)</p> <p>INAM-National Institute of Meteorology (Instituto Nacional de Meteorologia)</p> <p>INAMAR- National Service for Administration and Marine Inspection (Serviço Nacional de Administração e Fiscalização Marítima)</p> <p>IACM-Mozambican Institute for Civil Aviation (Instituto de Aviação Civil de Moçambique)</p> <p>CFM-Mozambique Railway (Caminhos de Ferro de Moçambique)</p> <p>INE-National Institute of Statistics (Instituto Nacional de Estatística)</p> <p>EDM-Mozambique Electricity Company (Electricidade de Moçambique)</p> <p>PETROC-Mozambique Oil (Petróleos de Moçambique)</p> <p>DINAF-National Directorate of Forestry (Direcção Nacional de Florestas)</p> <p>DINAB-National Directorate of Environment (Direcção Nacional do Ambiente)</p> <p>FUNAE-Energy Fund (Fundo de Energia)</p> <p>MGC-Matola Gas Company</p>	<p>AFOLU-Agriculture, Forestry and Other Land Use</p> <p>MASA-Ministry of Agriculture and Food Security (Ministério de Agricultura e Segurança Alimentar)</p> <p>DPCI-Directorate of Planning and International Cooperation (Direcção de Planificação e Cooperação Internacional)</p> <p>INIR-National Institute of Irrigation (Instituto Nacional de Irrigação)</p> <p>DINAV-National Directorate of Veterinary (Direcção Nacional de Veterinária)</p> <p>DINAS-National Directorate of Agriculture and Silviculture (Direcção Nacional de Agricultura e Silvicultura)</p> <p>DINEA-National Directorate of Agriculture Extension (Direcção Nacional de Extensão Agrária)</p> <p>MITADER-Ministry of Land, Environment and Rural Development (Ministério da Terra, Ambiente e Desenvolvimento Rural)</p> <p>DINAF-National Directorate of Forestry (Direcção Nacional de Florestas)</p> <p>DINOTER-National Directorate of Land Planning (Direcção Nacional de Ordenamento Territorial)</p> <p>FNDS-National Fund for Sustainable Development (Fundo Nacional de Desenvolvimento Sustentável)</p> <p>ANAC-National Administration for the Conservation Areas (Administração Nacional das Áreas de Conservação)</p> <p>FEMA-Enterpreunal Forum for Climate Change (Fórum Empresarial do Meio Ambiente)</p>	<p>MIC-Ministry of Industry and Commerce (Ministério da Indústria e Comércio)</p> <p>DPCI- DPCI-Directorate of Planning and International Cooperation (Direcção de Planificação e Cooperação Internacional)</p> <p>DNI-National Directorate of Industry (Direcção Nacional da Indústria)</p> <p>MIREME-Ministry of Mineral Resources and Energy (Ministério dos Recursos Minerais e Energia)</p> <p>DNE-National Directorate of Energy (Direcção Nacional de Energia)</p> <p>DNGE-National Directorate of Geology and Mines (Direcção Nacional de Geologia e Minas)</p> <p>CDM-Mozambique Beer company (Cervejas de Moçambique)</p> <p>CTA-Confederation of Economic Associations of Mozambique (Conferência de Associações Económicas de Moçambique)</p> <p>FEMA- Enterpreunal Form for Climate Change (Forum empresarial do Meio ambiente)</p> <p>INE-National Institute of Statistics (Instituto Nacional de Estatísticas)</p> <p>UNIDO- United Nations Industrial Development Organization</p> <p>MITADER-Ministry of Land, Environment and Rural Development (Ministério da Terra, Ambiente e Desenvolvimento Rural)</p>	<p>DINAB-National Directorate of Environment (Direcção Nacional do Ambiente)</p> <p>MISAU-Ministry of Health (Ministério da Saúde)</p> <p>DNGA-National Directorate of Environment Management (Direcção Nacional de Gestão Ambiental)</p> <p>MIREME- Ministry of Mineral Resources and Energy (Ministério dos Recursos Minerais e Energia)</p> <p>MASA- Ministry of Agriculture and Food Security (Ministério de Agricultura e Segurança Alimentar)</p> <p>ANAMM-National Association of Municipalities of Mozambique (Associação Nacional dos Municípios de Moçambique)</p> <p>AMOR-Mozambican Association for Recycling (Associação Moçambicana de Reciclagem)</p>



		<p>CTA-Confederation of Economic Associations (Conferência das Associações Económicas)</p> <p>FAEF-Faculty of Agronomy and Rural Engineering (Faculdade de Agronomia e Engenharia Rural)</p> <p>WWF-World Wild Fund of Nature (Fundo Mundial para a Natureza)</p> <p>UNDP-United Nations Development Programme (Programa das Nações Unidas para o Desenvolvimento)</p>		
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Annex 4 - Agenda of validation workshop

 REPÚBLICA DE MOÇAMBIQUE <hr/> 7.1.1.1 MINISTÉRIO DA TERRA, AMBIENTE E DESENVOLVIMENTO RURAL	
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AGENDA DO SEMINÁRIO

**Reunião nacional da Iniciativa para a Transparência Climática (ICAT) em
Moçambique 18 de novembro – Hotel Gloria**

	Dia 18 de Novembro de 2019	
Horas	Temas	Responsável
08.00-08.30	Registo dos participantes	Organização
08:30-08:50	Apresentação dos participantes e objectivos do seminário	DINAB
08:50-09:00	Intervenção da UNEP DTU- Projecto ICAT em Moçambique: Principais marcos e sua ligação com outras iniciativas de mudanças climáticas em Moçambique.	UNEP
09.00 – 09.15	Abertura oficial: Sra. secretária permanente do Ministério da Terra, Ambiente e Desenvolvimento Rural	Exma.



		sra. secretária permanente do MITADER
9:15-09:30	Foto família e intervalo de café	Organização
09:30-10:00	Consultoria # 1: Estudo sobre Testagem da Metodologia / Guião de Desenvolvimento Sustentável do ICAT na NAMA de carvão – “Promovendo uma Cadeia de Valor Sustentável de Carvão Vegetal em Moçambique”	PhD. Rosta Munjovo (Consultora)
10:00-10:30	Consultoria # 2: Estudo piloto do guião de Energias Renováveis- o caso do regulamento REFIT em Moçambique	dra. Emília Come, (Consultora)
10:30-11:00	Consultoria # 3: Roteiro para o estabelecimento de um Sistema Robusto de Monitoria, Reporte e Verificação das Mudanças Climáticas em Moçambique	Eng. Isidro Fote, (Consultor)
11:00-12:00	Debate	
12:00-12:40	Constatações finais dos consultores e resposta as questões de debate	Todos consultores
12:40-13:00	Constatações finais e passos seguintes	MITADER
13:00-14:00	Fecho e almoço	Organização

FIM

Annex 5 - Assessment of data availability for MRV of GHG emissions

Categories		Basic data	Lead institution	Other institutions	Data availability	
					YES	NO
Energy	Manufacturing Industries and Constructions	Iron and steel	No info			
		Non-ferrous Metals	No info			
		Chemicals	MIC			
		Pulp, Paper and Print	MIC			
		Food processing, Beverages and Tobacco	MIC			
		Non-Metallic Minerals	No info			
		Transport Equipment	No info			
		Machinery	No info			
		Mining (excluding fuels) and Quarrying	No info			
		Wood and wood products	No info			
		Construction	No info			
		Textile and Leather	No info			
	Transport	Domestic aviation	No info			
		International aviation	No info			
		International water --borne navigation	No info			
		Domestic water-borne navigation	No info			
		Pipeline transport	No info			
	Other	Commercial/Institutional,	No info			
		Residential,	No info			
		Agriculture/Forestry/Fishing	No info			
		Fugitive emissions from fuel	No info			
Industrial Processes and Product Use	Mineral Industry	Cement and glass production	Cimentos			
	Other Process Uses of Carbonates	Ceramics and Other use of Soda Ash	No info			
	Chemical Industry	Ammonia and Soda Ash production	No info			
	Metal Industry	Iron and Steel production;	MIC			
		Ferroalloys production,	MIC			
		Aluminium production and	MIC			
		zinc production	MIC			
	Non-Energy Products from Fuel and Solvent Use	Lubricant use	No info			
	Products Uses as Substitute for Ozone Depleting Substances	refrigeration and air conditioning	MIREME			
		Foam blowing Agents	No info			
		Fire Protection	MIREME			
		Aerosols	MIREME			



Categories		Basic data	Lead institution	Other institutions	Data availability	
					YES	NO
	Other	Pulp and Paper Industry				
		Food and Beverages Industry				
Agriculture, Forestry and Other Land Uses	Livestock	Enteric Fermentation and Manure Management	MASA-DINAV			
	Land	Forest,	MASA-DINAV			
		Cropland,	MASA-DINAV			
		Grassland,	MASA-DINAV			
		Wetlands,	MASA-DINAV			
		Settlements,	MASA-DINAV			
	Aggregate sources and non-CO2 emissions sources on land					
Waste	Solid waste disposal	Managed waste disposal site,	Conselho Municipal	MOPHRH		
		Unmanaged Waste disposal	Administracao do Distrito	MOPHRH		
		Uncategorised waste disposal				
	Biological treatment of solid waste		Unidade Sanitária	MISAU		
	Wastewater treatment and disposal	Domestic wastewater treatment and discharge	MOPHRH/ETAR Municípios	MOPHRH		
		Industrial wastewater treatment and discharge	Industriais-MICO	MIC		