

Initiative for Climate Action Transparency - ICAT -



(Rice production from Chokwe irrigation campo, Mozambique)



(Cahora Bassa Hydroelectric dam of Mozambique - An example of an investment with high impact and minimum emission of Greenhouse Gas emissions)

Component 2: Assessment of the Current Institutional Arrangement for MRV of Climate Change *Identification of Challenges, Barriers, and Relevant Initiatives*



**Initiative for Climate Action Transparency - ICAT -
Assessment of the Current Institutional Arrangement for National MRV of CLIMATE
CHANGE: Identification of Gaps, Challenges, and Relevant Initiatives**

Deliverable #2

AUTHORS

Isidro Fote (isidro.fote@gmail.com)

Independent Consultant

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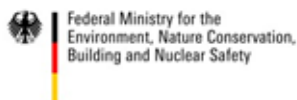
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1. Abbreviations and Acronyms

| Acronym | Meaning |
|---------|--|
| ACM | Mozambican Academy of Science (<i>Academia de Ciências de Moçambique</i>) |
| BUR | Biennial Update Report |
| CTA | Confederation of Economic Associations (<i>Confederação de Associações Económicas</i>) |
| CGC-MC | Knowledge Management Center of Climate Change (<i>Centro de Gestão de Conhecimentos em Mudanças Climáticas</i>) |
| CONDES | National Council for Sustainable Development (<i>Conselho Nacional de Desenvolvimento Sustentável</i>) |
| DINAB | National Directorate of Environment (<i>Direcção Nacional do Ambiente</i>) |
| DINAF | National Directorate of Forestry (<i>National Directorate of Forestry</i>) |
| DNSA | National Directorate of Agriculture Services (<i>Direcção Nacional dos Serviços Agrários</i>) |
| DPEF | National Directorate of Economy and Finance (<i>Direcção Nacional de Economia e Finanças</i>) |
| DRR | Disaster Risk Reduction |
| DTU | Technical University of Denmark |
| 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>) |
| FAO | Food and Agriculture Organization of United Nations |
| FEMA | Business Forum for Climate Change (<i>Fórum Empresarial do Meio Ambiente</i>) |
| FNC | First National Communication on Climate Change |
| FNDS | National Fund for Sustainable Development (<i>Fundo Nacional de Desenvolvimento Sustentável</i>) |
| FUNAE | Energy Fund (<i>Fundo de Energia</i>) |
| GHG | Greenhouse gases (<i>Gases de efeito de estufa</i>) |
| GIIM | Inter-Institutional Group for Climate Change (<i>Grupo Inter-Institucional para as Mudanças Climáticas</i>) |
| GIZ | German Society for International Cooperation |
| ICAT | Initiative for Climate Action Transparency |
| INAM | National Institute of Meteorology (<i>Instituto Nacional de Meteorologia</i>) |



| Acronym | Meaning |
|----------|--|
| INAS | National Institute of Social Affairs (<i>Instituto Nacional de Acção Social</i>) |
| INE | National Institute of Statistics (<i>Instituto Nacional de Estatísticas</i>) |
| INGC | National Institute of Management of Calamities (<i>Instituto Nacional de Gestão de Calamidades</i>) |
| IIAM | Mozambique Agriculture Research Institute (<i>Instituto de Investigação Agrária de Moçambique</i>) |
| JICA | Japan International Cooperation Agency |
| MASA | Ministry of Agriculture and Food Security (<i>Ministério da Agricultura e Segurança Alimentar</i>) |
| MEF | Ministry of Economy and Finance (<i>Ministério de Economia e Finanças</i>) |
| MIC | Ministry of Industry and Commerce (<i>Ministério da Indústria e Comércio</i>) |
| MICOA | Ministry of Coordination for Environmental Affairs (<i>Ministério para a Coordenação da Accção Ambiental</i>) |
| MINEC | Ministry of Foreign Affairs and Cooperation (<i>Ministério dos Negócios estrangeiros e Cooperação</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 | Monitoring, Reporting and Verification |
| MTC | Ministry of Transport and Communication (<i>Ministério dos Transportes e Comunicações</i>) |
| NAMA | Nationally Appropriate Mitigation Actions |
| NFI | National Forestry Inventory |
| NDC | Nationally Determined Contribution (<i>Contribuição Nacionalmente Determinada</i>) |
| NDC-P-SF | Nationally Determined Contribution Partnership, Support Facility |
| PAMC | Climate Change Action Plans (<i>Planos de Acção das Mudanças Climáticas</i>) |
| PEER | Public Environmental Expenditure Review |
| REA | Environment Status Report |
| REDD+ | Reduction of Emission from Deforestation and Forest Degradation |
| SAN | Food Security and Nutrition (<i>Segurança Alimentar e Nutricional</i>) |
| SCN | Second National Communication |



| Acronym | Meaning |
|---------|---|
| | <i>(Segunda Comunicação Nacional)</i> |
| SETSAN | Technical Secretariat for Food Security and Nutrition <i>(Secretariado Técnico de Segurança Alimentar e Nutricional)</i> |
| SISTAFE | State Financial Administration System <i>(Sistema de Administração Financeira do Estado)</i> |
| SNMAMC | National System for Monitoring and Evaluation of climate change <i>(Sistema Nacional de Monitoria e Avaliação das Mudanças Climáticas)</i> |
| SWOT | Strengths, Weaknesses, Opportunities and Threats <i>(Forças, fraquezas, oportunidades e ameaças)</i> |
| UEM | University of 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 |
| UP | Pedagogic University <i>(Universidade Pedagógica)</i> |
| USAID | United States Agency for International Development |



2. Introduction

2.1. About this document

As early as the start of the 1990, almost all countries joined together 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) at the Conference on environment and development, held in Rio de Janeiro, Brazil, in June 1992. The UNFCCC is the primary international intergovernmental forum for negotiating the global response to climate change (United Nations General Assembly, 2015). Like any other multilateral environmental regime, the climate regime is based on a system of transparency through regular reporting and the review process that aims to hold countries accountable for their actions and obligations when it comes to facing the climate (Barakat et al., 2017). Mozambique ratified the UNFCCC on 25 August 1995, which implied agreeing to the following commitments:

- Develop and periodically update, publish and make available to the UNFCCC, in accordance with Article 12, national inventories of anthropogenic emissions by sources, and removals by sinks of all greenhouse gases (GHGs) not controlled by the Montreal Protocol;
- Cooperate in preparing for adaptation to the impacts of climate change, develop appropriate integrated plans for coastal zone management, water resources and agriculture, and protect and rehabilitate areas affected by drought, desertification and floods;
- Communicate to the Conference of the Parties information on implementation, in accordance with the terms of Article 12.

Following the adoption of the UNFCCC, Mozambique has been an active member to the several events organized by the Framework. In 2015, the UNFCCC organized the 21 COP, in Paris, on 12 December 2015, where they reached a landmark agreement to combat 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 Convention efforts and – for the first time – brings all nations into a common goal to undertake ambitious efforts to combat climate change and adapt to its effects, with enhanced support to assist developing countries in achieving their targets. As such, it charts a new course in the global climate effort with an improved view of keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius.

Additionally, the Paris Agreement will increase the ability of countries to deal with the impacts of climate change, and to make finance flows consistent with a low GHG emissions and a climate-resilient pathway. To reach these ambitious goals, appropriate mobilization and provision of financial resources, a new technology framework and enhanced capacity-building is to be put in place, thus supporting action by developing countries and the most vulnerable countries, in line with their own national objectives. The Paris agreement also provides for an enhanced transparency framework for action and support.

It is the vision of enhancing transparency framework for action and support that multi-donor neutral fund was designed to improve the capacity of developing countries, such as Mozambique, to assess



the impacts of their actions to meet their Intended Nationally Determined Contributions (INDCs) and bring to greater quality, trust and ambition to climate policies worldwide. This multi-donor neutral fund is denominated Initiative for Climate Action Transparency (ICAT). In Mozambique, ICAT was introduced by the partnership between UN Environment and the Technical University of Denmark (DTU) with a focus on the country needs related to national MRV requirements and the assessment of impacts of climate policies. The Ministry of Land, Environment and Rural Development (MITADER) was engaged as an 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.

2.2. Objectives

The set of activities related to this report are the following:

- Map the previous and ongoing relevant work on MRV in Mozambique;
- Identify the relevant MRV initiatives and engage with them for potential synergies;
- Identify the gaps and challenges in institutional arrangement, procedures and legal arrangements for national MRV;
- Identify barriers to private sector GHG reporting to the national MRV system on climate change.

2.3. Methods used

This report was developed using five main methods:

1. Literature review covering the main climate reports submitted to the government of Mozambique and to the UNFCCC. These documents include the report on the national inventory of GHGs, the first and second Mozambique National Communications, the National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC, in Portuguese), The National System for Monitoring and Evaluation of Climate Change (SNMAMC, in Portuguese), among others.
2. The second method was through discussions about the MRV system with the National Directorate of Environment (DINAB) and with UNEP DTU Partnership. At DINAB, discussions were held with the National Director and her team (through its directive meetings), the climate change focal point person and head of department, the ICAT focal point person and DINAB technicians.
3. The third approach was to communicate with some key stakeholders outside MITADER in the following institutions MEF, FNDS, MIREME, MIC, CTA, FAO, UNDP, FEMA, MISAU, and GIZ. A full list of people contacted is included in the appendix 9.1.
4. The fourth approach was a stakeholder meeting to present the results of the assessment and collect feedback from the representatives. This meeting was also to get further information that we could not get during the literature review or during the interview with stakeholders (see outcomes in appendix 9.2).
5. Lastly, the task was coordinated on monthly basis with the team at UNEP DTU Partnership through video conferences. Table 1 shows the dates of the video conferences held with UNEP DTU Partnership team.



Table 1: Video Conference held with the Consultants

| Month | Schedule |
|----------|---|
| February | Friday 15 at 10:30 (Maputo time) |
| March | Friday 8 at 10:30 (Maputo time) |
| April | Friday 5 at 10:30 (Maputo time) |
| May | Friday 3 rd May 9:00 (Maputo time) |



3. Overview of the Past and Ongoing Initiatives

3.1. Background on MRV initiatives

Mozambique first became member of the UNFCCC on 12 June 1992, following by the ratification of the Convention on 25th August 1995. This was followed by the ratification of the Kyoto Protocol on 18th January 2005. The Kyoto Protocol entered into force in April 2005. In October 2016, the country submitted its Intended Nationally Determined Contribution (INDC) with a vision of planning activities that would contribute to greenhouse gas emission and reduce vulnerability to climate change for 2020-2030. The country ratified the Paris agreement in June 2018 and is currently in the process of submitting the updated NDC and its operationalization plan in 2019. As part of the compliance of the country with these international treaties and its own national monitoring on climate change, the country prepared the following documents:

- Greenhouse Gas Inventory;
- National Communications (NC);
- National Strategy for Adaptation and Mitigation of Climate Change;
- Biennial Update Report;
- Nationally Determined Contribution;
- Climate Public Expenditure and Institutional Review;
- Public Environmental Expenditure Review;

The first document developed was the National GHG Inventory in 1998, using data from 1990. The National GHG Inventory was updated in 2000, using data from 1994. The GHG inventory data from 1994 was used to produce the initial National Communication in 2003. Next, the country collected data from 1995 to 2004, resulting in a GHG inventory report that was published in 2010. The GHG inventory data from 2010 was the basis for the production of the National Strategy for Adaptation and Mitigation of Climate Change (ENAMMC), which was published in 2012.

The National Communication (NC) was prepared twice in Mozambique: in 2003, and in 2011. However, the second NC that was produced in 2011 was not approved by the Government of Mozambique and hence never submitted to UNFCCC. In 2012, the country elaborated and approved the National Strategy for Adaptation and Mitigation to Climate Change (ENAMMC). The ENAMMC mandated the creation of the system for its monitoring and evaluation, which resulted in the development of a National System for Monitoring and Evaluation of Climate (SNMAMC), which was published in 2014, and the first report was produced in 2017. This first SNMAMC report was developed based on a set of indicators included in the ENAMMC, and was not submitted to the Council of Ministers, regardless of the mandate for submission. The SNMAMC report was supposed to be prepared annually but, to date, only the 2017 report has been prepared and submitted to the Ministry of Land, Environment and Rural Development (MITADER). The report did not pass for submission to the Council of Ministers, which is the final consignee.

With respect to Biennial Update Reports (BUR), the UNFCCC decision states that all parties are supposed to submit their first biennial reports by 2014. Unfortunately, Mozambique did not submit its



BUR up to today. The country is on the way to elaborate the National GHG Inventory, now using the IPCC 2006 guidelines, to include in the Biennial Update Report (BUR).

Another report that was produced is the Climate Public Expenditure and Institutional Review (CPEIR). This report was produced in 2017, using data from 2009 to 2014. The report provided information regarding the government's expenditure on climate change and the impact on institutional arrangement. Although this report was not supposed to be submitted to the council of Ministers, this constitutes an important tool for decision makers in terms of policy making and budget allocation (Vaislic and Zaqueu, 2017). Table 2 below presents a summary of the main reports prepared by Mozambique.

| Report name | Recommended Frequency | Observation |
|---|-----------------------|--|
| National Greenhouse Gas Inventory | Every 2 years | First national GHG inventory report: was released by MICOA in 1998, using data from 1990 and the IPCC 1996 guidelines. Update of the first national GHG inventory: was released in 2000 using data from 1990 and 1994 and the 1996 IPCC guidelines. This inventory was used to elaborate the First National Communication. Second national GHG inventory report: used data from 1995 to 2004, released by MICOA in 2010 and was used to elaborate the Second National Communication. |
| National Communication | Every 4 years | First National Communication published in 2003, using data from 1990 and 1994. Second National Communication, used data from 1995 to 2004. Never published. |
| Biennial Update Report | Every 2 years | To be submitted in 2019 |
| (Intended) Nationally Determined Contribution | Every 5 years | INDC produced and submitted in 2015 NDC produced in 2018 and under approval |
| National System for Monitoring and Evaluation of Climate Change | Annual | First SNMAMC produced in 2017. |
| Climate Public Expenditure and Institutional Review | Every 5 years | First CPEIR produced in 2017 using data from 2009-2014. CPEIR reports coincide with the Public Expenditure Environmental Review (2005-2010) |

Table 2: Reports prepared for monitoring climate change in Mozambique (Source: Author)

3.2. National System for Monitoring and Evaluation of Climate Change

3.2.1. Background

The National System for Monitoring and Evaluation of Climate Change (SNMAMC) results from the National Strategy for Adaptation and Mitigation to Climate Change (ENMAMC), which requires an instrument to measure the progress of the strategy. The main objectives of the SNMAMC are the following:

- Improve accountability in use of resources and verify effective allocation of resources to the sectors, at all levels and for the most vulnerable groups;
- Support inter-sectoral coordination and the implementation of ENAMMC and Climate Change Action Plans (PAMC) through monitoring and learning from the implementation process;

- Evaluate to what extent the ENAMMC has contributed to reduce vulnerability to climate change and achieve Mozambique's national development goals despite the change of the country's climate regime;
- Inform policy making and planning by developing new evidence on effectiveness of adaptation, mitigation and disaster risk reduction approaches;
- Fulfil reporting requirements at national (Government) and international levels.

3.2.2. Institutional arrangements

The SNMAMC's reporting system starts at the National Directorate of Environment (DINAB), that summarizes the information and produces the first draft report with information collected at the sector level and at the Ministry of Economy and Finance. The complete report is shared with the respective ministries for revision and feedback. Following approval from the ministers, the report is then shared at the technical council¹ of MITADER for further comments, and at the consultative-council² of MITADER for approval. The approved document is brought to the Council of Ministers³ by the Minister of MITADER.

There are two institutions that play a supporting role. The National Fund for Sustainable Development (FNDS) play a role of financial bank for the climate change actions. It is the institution created by the government to be a repository of climate change funds. The other institution is the Knowledge Management Center for Climate Change (CGC-MC). This center that has the mandate to assist in revision and peer reviewing the reports produced by DINAB and any other stakeholders. The KMC-MC is led by Eduardo Mondlane University (figure 1).

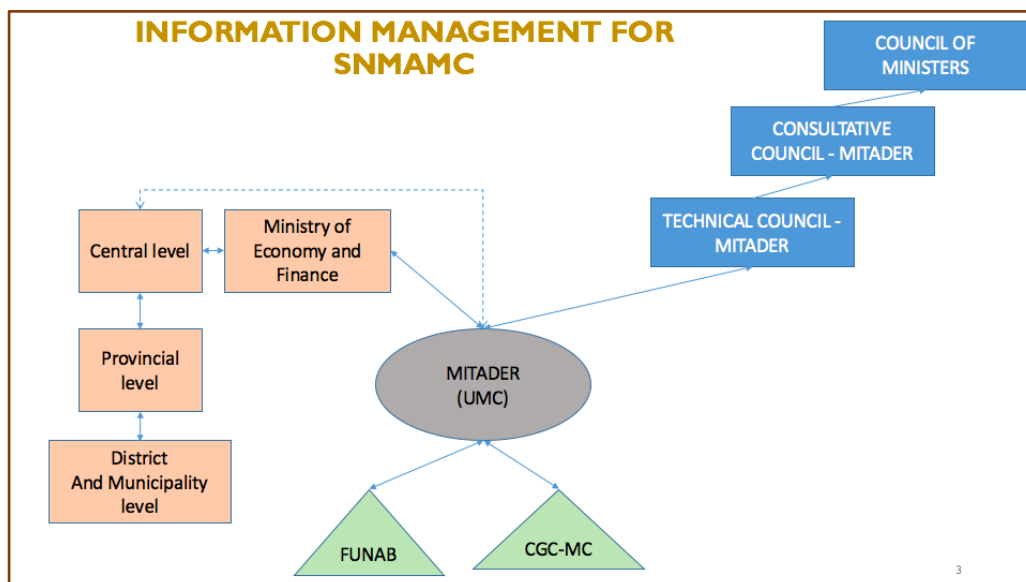


Figure 1: Reporting Structure for the SNMAMC (Source: MITADER, 2015)

¹ Technical council is a technical meeting lead by the permanent secretary normally attended by the national directors, Leaders of coordinated and subordinated institutions. The objective of these meetings are to technically appreciate the topics to be taken to the the minister.

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

³ Council of ministers is a meeting lead by the president of the republic where all the ministers attend including come sector leaders.



3.2.3. Information collected and sources of information

The SNMAMC collects information on adaptation, mitigation and cross cutting sectors (MITADER-2014). The total number of indicators is 100, but recognizing the challenges of institutions and the reporting sectors, it selected for first reporting the indicators included in table 3.

| Pillar | Sectors ENAMMC | Indicators | Baseline 2012 | 2017 Status | Target 2017 |
|-------------------|--|---|---------------|----------------|--|
| Impact indicators | Impact 1 | Number of districts that budget the climate change actions identified in the national socio-economic plan (PES) in annual district budgets (PESOD). | 0 | 39 | 10 |
| | Impact 2 | Number of sectors included in the National climate change Adaptation and Mitigation Strategy reporting through the national climate change M&E framework. | 0 | 13 | 13 |
| Adaptation | Strategic Area 1.1: Climate risk reduction | Forecasts delivered on a daily basis for the agriculture and fisheries sectors in Gaza and Inhambane Provinces, as measured by records of daily web-portal updates, OR radio transmissions, OR television reports OR SMS broadcasts. | 0 (2007) | 0 (2007) | 50%*1740 00 (87000) for Farmers 40%*1740 00 69600 for Fisherman |
| | Strategic Area 1.3: Agriculture, Fisheries and Food Security and Nutrition (FSN) | Number of households engaged in climate smart agriculture in all ten provinces (as measured through quarterly reporting to MINAG from agriculture extension workers). | 15000 | 41015 | 32000 |
| | Strategic Area 1.4: Social Protection | Number of households in climate vulnerable districts listed by the Institute of Disaster Management (INGC) benefiting from the National Productive Social Action Program (as measured in National Institute of Statistics (INE) household survey data). | 0 | 34 370,0 0 | 10 000,00 |
| | Strategic Area 1.5: Health | Number of high-risk districts and municipalities listed by the Institute of Disaster Management (INGC) that have introduced and tested disaster preparedness and response protocols for health service delivery. | 0 | 0 | 10 |
| | Strategic Area 1.8: Infrastructures | Percentage of district roads that are re-constructed or upgraded from 2014 onwards in pilot provinces (Gaza and west Inhambane) in compliance with revised guidance and design standards. | 0 | 28,6% | 80% |
| Mitigation | Strategic Area 2.1: Energy | Expected Additional Energy available through (i) proposed renewable energy generation and/or (ii) projected savings from identified efficiency measures | 0 | 104.75 (MW) | 45 (MW) |

Table 3: Indicators included in the first reporting of SNMAMC (Source: MITADER, 2016)



3.2.4. Mechanism for verification of information

The SNMAMC reporting is through collaboration with the process of reporting on the Social and Economic Plan (PES) of the Government of Mozambique. Under this framework, the government ministries report to the Ministry of Economy and Finance (MEF) on the results on the pre-selected indicators. The MEF collects and ensures data quality and the Ministry of Land, Environment and Rural Development (MITADER) receives data from MEF to produce SNMAMC report. The system allows MITADER to contact and have direct information from the provinces and districts. In such cases, the MITADER is responsible to verify the information other government institutions.

The information about activities and results taking place at district level, including activities on climate change, is shared at the provincial level through the planning instrument of the national government. The PES are very important for climate change because this is the main source of information on adaptation and mitigation of climate change. It is through the PES that districts and provinces report all their activities during the quarter, semester, and year. The Provincial Directorate of Economy and Finance (DPEF) has the responsibility to produce a report, at the provincial level, to be submitted at the national level. At the national level, the sectors have the responsibility to supply information regarding the progress of PES to the Ministry of Economy and Finance (MEF). Currently, the information submitted to MEF is verified through the following means:

- *Monitoring of execution (planned execution compared to financial documents):* The budgets submitted to MEF are subject to further analysis for verification if prices and quantities are similar to standard prices for purchase of products in Mozambique. After verification of the pricing, a team from Monitoring and Evaluation Department of MEF selects on a random basis some provinces and programs to visit the results;
- *Administrative Tribunal:* This unit of the government of Mozambique has the aim of auditing all the accounts to ensure that the principles and protocols are in place for the acquisition of the products and services. Although this team is focused on procedures, there is no limitation in terms of inspecting specific activities that have been reported as achieved, if the documentation does not allow to draw that conclusion;
- *General Inspection of Finance:* This is an organism linked to MEF that has a mandate to inspect the work of different entities reporting to the MEF;
- *Assembly of the Republic:* subdivided into Provincial Assembly and Republic Assembly, this is constituted by members from the political parties with a mandate to monitor the government work and to legislate on matters that are necessary for the country. At the national level, the Assembly of the Republic monitors the report from MEF that, by law, is deposited into their office. At provincial level, the Provincial Assembly monitors the report from the provinces and districts which, by law, is also deposited into their office. Both assemblies have divided themselves into different units (economy, legal, environment, among others). It is the environment unit that focuses on activities that are reported to UNFCCC which are included into the SNMAMC reports.

3.2.5. Challenges and barriers



The following challenges have been identified from the experience of reporting on the SNMAMC:

a) Challenges in reporting the financial investments on climate change

The government established classifiers⁴ or climate change. However, many sectors do not use the classifiers when registering an expenditure either because do not have knowledge about it, or because they do not regard it as important. Without classifying an expenditure, the government is not able to identify the level of expenditure to climate change.

b) Weak follow up of the SNMAMC instrument mandate

SNMAMC has been presented at the council of ministers just for approval, but this document is not subject to annual monitoring, analysis and feedback. On the other hand, SNMAMC is mandated to report on outcomes on international event, however, this information is hardly available. For instance: sectors' participation in the Conference of Parties (COP) only report to the council of ministers when a participant is Minister.

c) Lack of public documentation of SNMAMC

SNMAMC is not publicly available in many resources available within the government. SNMAMC is not available in the sector's webpage, it cannot be found in the sector's library, and it is not available at the national entity for documentation. On the other hand, the report on the SNMAMC is also not available in all possible resources that make documents available. Absence of these documents make them unknown to many new initiatives and decision makers.

d) Lack of reporting on the implementation of Government approved instruments

The Government of Mozambique through the SNMAMC mandates the environment sector to report on the climate change actions on yearly basis. However, since approval of the SNMAMC, there has been only one incomplete report on the climate change, which did not progress much in terms of its approval and publication.

The SNMAMC challenges are summarized in figure below (see Figure 2 below).

⁴ Classifiers are codes created by MEF that allow coding of an expense in terms of climate change when using the state budget..

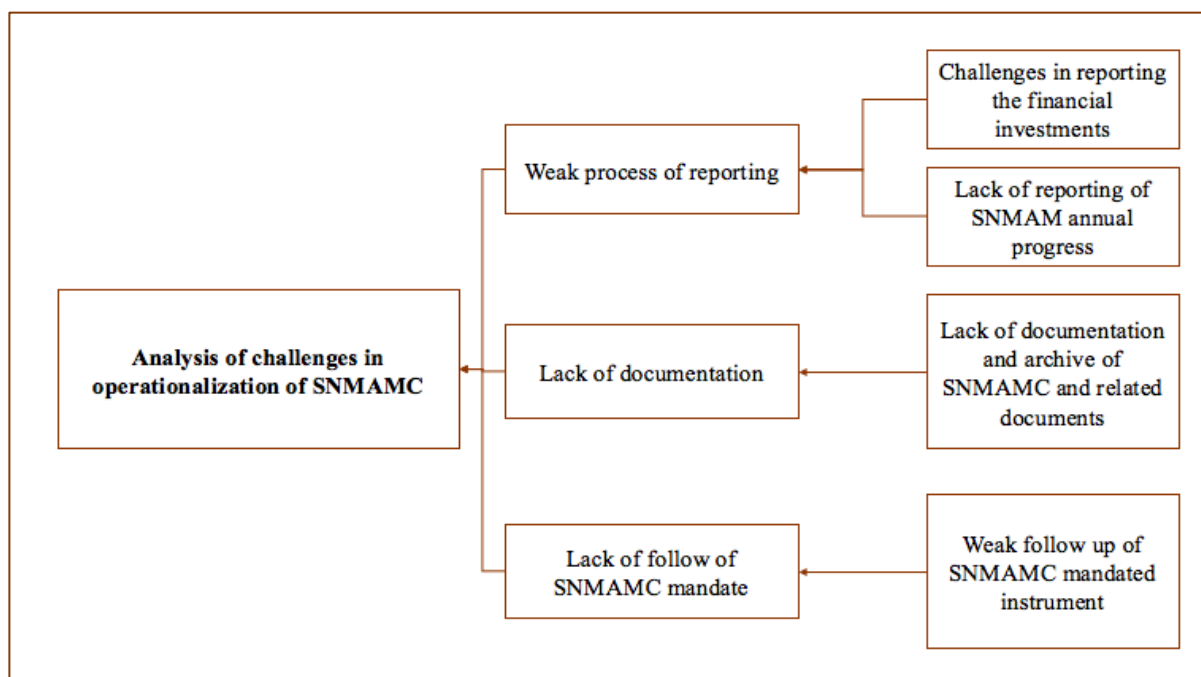


Figure 2: Challenges with the existing SNMAMC (Source: Author)

3.3. Greenhouse gas inventory

3.3.1. Background

Mozambique finalized the process of elaboration of the first GHG inventory in 2000 using data from 1990 and 1994. The second GHG inventory covered the period from 1995 to 2004. The results of the second GHG inventory constituted Chapter II of the Second National Communication of Mozambique to the UNFCCC. The estimations of the country's GHG emission of sources and removals by sinks applied the IPCC 1996 guideline. This guideline considers emissions occurring in six sectors, namely energy, industrial processes, use of solvents and other products, agriculture, land use change and forestry and landfills. However, the estimated emissions for Mozambique do not include the use of solvents and other products because of lack of information about these components.

In 1990, the total net quantity of estimated emissions was 8,625.82 CO₂ eq. In 1994, this number increased to 15,907.00 Gg CO₂eq. The second GHG inventory was conducted from 1995 to 2004 reached the level of 1,209,139.50 Gg CO₂eq. The comparison between the first GHG report results (1990 and 1994), and the last GHG report results show that there is a huge change in all sectors. The authors mention that in the first GHG inventory the reality of the country did not allow for reliable inventories. For the last GHG inventory in 2000, the quality of statistics registration has evolved significantly and it continues to improve to date.

3.3.2. Institutional arrangements

The current institutional arrangement for the GHG inventory in Mozambique includes the five main sectors: energy; industrial processes; agriculture and soil use; land use, land use change, and forestry; waste. The collection of GHG data is coordinated by MITADER, where the climate change focal

point person is located and who coordinates the process of support for GHG inventory. MITADER uses the resources provided by UNFCCC and other supporters to hire a consultant to develop the GHG inventory.

The process of coordination of the GHG inventory lies at DINAB, which plays a central role in the whole process. To date, all the GHG inventories are prepared by the GHG inventories group that had a university lecturer selected by MITADER under a competitive process. Under each of the GHG category, a senior lecture is assigned to lead the process of data collection and analysis with close coordination of an assigned MITADER staff. The lead for each sector meets with government institutions, private sector institutions, and civil society to collect information. The lead consultants are selected by DINAB in a competitive manner according to their expertise.

The other government institutions linked with climate change (Energy sectors, Industrial process sectors, agriculture, forester and land use sectors, forestry sectors, and waste sectors), provide technicians for every category, to support the process of data collection through the Inter-Institutional Group for Climate change (GIIMC) framework. Following the technical revision by GIIMC, a document is returned to DINAB-MITADER for technical appreciation internally and then taken to the technical council of MITADER (CT-MITADER) where, if approved, is taken to consultative council (CC-MITADER) and then presented and appreciated at the Council of Ministers. This is when the document is ready to be shared to UNFCCC. Figure 3 below presents the sectors involved in collecting, presenting and analyzing data for the production of GHG inventory report and the steps taken to its approval.

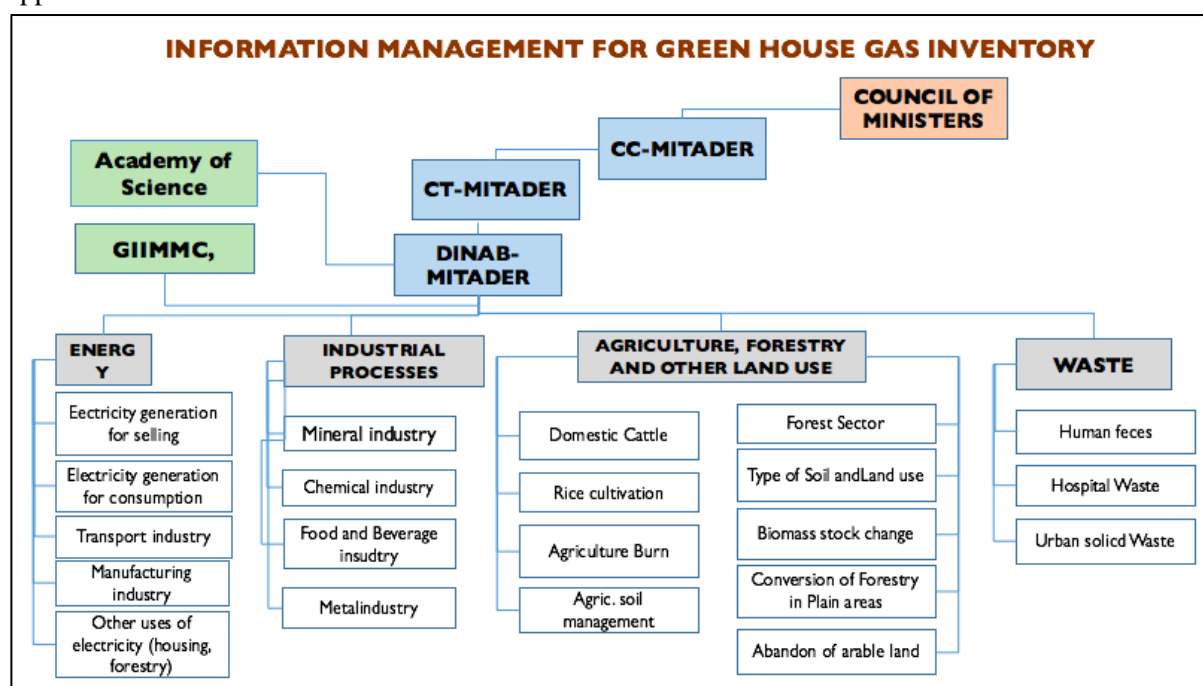


Figure 3: Institutional arrangements for the preparation of national GHG inventory (Source: Adapted from MICOA, 2010, MICOA 2011)

3.3.3. Information collected and sources of information

The situation of collection of data for GHG inventory in Mozambique is described in Table 4 below. The table shows that few data is collected at this level compared to several indicators that could sup-

port the country in data collection. The main institutions where this information is/should be located are MIREME, MIC, MITADER, MASA, INE and MISAU.

| Sector | Type of Information | Responsible institutions in Mozambique |
|--|--|--|
| Energy | <p>Reports on Electricity generation capacity (Mozambique electricity company-EDM, Hydroelectric dam (HCB), Energy Fund (FUNAE) for consumption and for selling;</p> <p>Type electricity sources (hydraulic, diesel, gas, natural gas)</p> <p>Transport (Petroleum products (fuel oil, lubricants, illuminating petrol, diesel, AV-Gas, Jet A1), Diesel consumption)</p> <p>Natural gas consumption</p> <p>Mineral coal production and consumption</p> <p>Use of domestic energy (fuel wood, charcoal, other)</p> <p>Biomass usage (wood, charcoal)</p> <p>Fugitive emission from fuel</p> <p>Statistic information from INE</p> | <p>MIREME</p> <p>MTC</p> <p>MITADER (DINAF)</p> <p>INE</p> <p>EDM</p> <p>Mozambique Petrol companies (Petro Moc), British Petrol</p> <p>National Institute of Standards and Quality</p> |
| Industrial process and product use | <p>Mineral Industries</p> <p>Metallurgical industries</p> <p>Number and type of industries (small, medium and large)</p> <p>Sugar cane industries and production</p> <p>Cement Industry (and those using clinker)</p> <p>Metal Industry (Aluminium melting-Mozal)</p> <p>Beverage industries and quantity of production</p> <p>Number and type of transforming industry</p> <p>Pulp and paper Industry</p> <p>Food Industry (crackers) and quantity of production</p> <p>Non energy products;</p> | <p>MIC</p> <p>MASA</p> <p>INE</p> <p>Major industries (cement, aluminium,)</p> |
| Agriculture, Forestry and other Land Use | <p>Livestock (cows, milking cows, Buffalos, goats, sheep, pigs, horses/donkeys/ (asinine), other</p> <p>Irrigated rice production</p> <p>Bush fire</p> <p>Burning of productions remaining</p> <p>Use of fertilizers and soil management;</p> <p>Sugar cane production</p> <p>Production of legume and non-legume produce</p> <p>Statistic Information from INE, IAI, PEDSA, Annual Yearbooks</p> <p>Area under Forest and its characteristics (deforestation rate, timber production, processing methods, change in Biomass stocks, conversion of forest in flat land</p> <p>Abandon of arable land</p> <p>Type of soil and its emissions</p> <p>Statistic Information from DINAF</p> <p>Statistic Information from FAO</p> | <p>MITADER</p> <p>MASA</p> <p>INE</p> <p>National Center for Cartography (CENACARTA)</p> <p>Private Sector (Farmers)</p> <p>MIREME</p> <p>National Agriculture Research Institute (IIAM)</p> |
| Waste | <p>Urban and city population</p> <p>Urban waste production</p> <p>Incineration of Hospital waste</p> <p>Human dejects</p> <p>INE population information</p> <p>Specific studies about waste generation (GIZ-2003)</p> | <p>MITADER</p> <p>MISAU</p> <p>INE</p> <p>ANAM</p> <p>MIC</p> <p>Regional Administration of Water (ARA)</p> <p>MIREME</p> <p>MASA</p> <p>MIC</p> |

Table 4: Information collected for the GHG inventory (Source: MICOA, 2010, MICOA 2011)

3.3.4. Mechanism for verification of information

The guidelines for National GHG Inventory state that the report needs to be validated by an independent institution. The ENAMMC states that the institution to validated the GHG inventories is the Mozambican Academy of Science (ACM). To date, the ACM has not been fully established and it cannot perform its mandate of assessing the National GHG Inventory. The ACM has been supported by the World Bank and the United States Agency for International Development (USAID) as a virtual institution that would lead studies, workshops, virtual lessons among other initiatives. Unfortunately, to date, only few staff are keeping the ACM functional. The ACM is involved in most of the climate change events as observer.

The first GHG inventory of the country was conducted using the tier one (Tier-I) methods with clear information about the various categories for calculation. Most of data collected was possible to verify since they were in the Annual Yearbooks or other documents from the National Institute of Statistics. The GHG estimations for the country have some assumptions that can be improved. The following table 5 explains some of the issues with each category.

| Category | Assumptions and possible improvements |
|-----------------------------------|---|
| Energy | Electricity produced in Mozambique is sold to Republic of South Africa, Zambia, Zimbabwe, and Malawi. There is a need so separate what is produced and consumed in Mozambique if this is from same source (renewable) or from any other source No discrimination of information about petrol usage per sector (ex: petrol for railway, petrol for aviation, petrol for Agriculture, petrol for electricity production) EDM is not producing data related to production and consumption of electricity from thermic sources from 2006, leaving this important source of information behind. |
| Agriculture Forestry and Land use | There is no consideration on all the crops carbon sequestration but the forestry and other crops. Studies can be made for each and every culture to express the level of sequestration per crop. Lack of annual data for some variables. the census been made every 10 years Inexistence of emission factors specific for the country Inexistence of data on annual basis Other variables have very slow change: change in stock of biomass in the forestry and of the woodland, flatland; There is no equipment neither human resources to collect data on bush fire, and forest cover. There are different methodologies for data collection, especially for the inventories and increase or decrease for some variables might be due to change in methodology; There was assumption of linear correlation between deforestation and time; Lack of annual growth of forest and carbon fraction in the dried matter |
| Industrial processes | There limited information on Industrial processes and a focus is more on bread industry while there are plenty of industries not accounted for. The private sector and mineral sector need to be accounted. No specific emission factor for the data produced by the sectors. In other cases, lack of total data |
| Waste | The waste process took into account the following assumptions: All hospital residuals are incinerated All solid residuals are deposited in the waste deposit Waste generation does not change with year Protein consumption does not change from year to year |

Table 5: Aspects for improvement and assumptions considered for the process of GHG estimations (Source: MICOA, 2010, MICOA 2011)



3.3.5. Challenges and barriers

The process of elaboration of greenhouse gas inventory in Mozambique faces the following challenges:

a) Data is not available in the needed format and is not systematically collected

In many cases the process relied on approximations or proxy calculation of variables to be inserted into the system for CO₂eq. calculations. The primary responsible unit to produce valid statistical information in Mozambique is the National Institute of Statistics (INE). Currently, INE does not have basic statistics for some of the key areas such as environment, climate change, land management, among others. The sectors do not have this mandate or financial structure or technical skills to perform statistical yearbooks, or Census or a survey, nevertheless, they are the ones that have to plan and finance the production of statistical data.

Many sectors do not have databases with the required information and rely on written reports or information collected from the sources when the need comes. Online open datasets for general information useful to the public are necessary for improved reporting. For example: information such as number and type of livestock in Mozambique per year; quantity of electricity produced and number of beneficiaries; quantity of fuel imported per year; area under forestry, is very basic and can be loaded on internet databases, and allow for research and students using the information for basic data analysis on emissions.

In addition, the process of collecting information is very challenging with sectors. In many cases, they are not willing to provide information because it could have consequences for their institutions, if some categories are found weak. The friendship relation to data providers in sectors is more prominent than formal systematic procedures.

Under the data collection, there is also a very strong reliance on private sector institutions. For instance, Mozambique cement company, bread making association, Mozambique aluminium melting company, among others. The reliance of private sector institution demonstrates that the sectors are strong and able to collect data. On the other hand, there is the fear that government cannot control information from its own country. If information is systematized and stored within government databases, its availability and usefulness will improve.

b) Mozambique has not yet calculated country-specific emission factors.

Mozambique is still using standard tier I information, which consists of basic information multiplied by the emission factor. To date Mozambique was using international emission factor for all the variables in the GHG emission calculation. Even the tier I data that is needed for the GHG emission calculation is no existent.

c) Understaffed GHG inventory coordination unit

The GHG calculation in Mozambique is coordinated at the National Directorate of Environment, the Climate Change Department (DMC). The DMC lacks technical staff to coordinate the support to the other sectors and ensure that necessary support is needed. Much of the information collected in the sectors are conducted by the voluntary team that works under coordination of hired consultants. A unit for coordination of the GHG inventories properly staffed (with one specialist per GHG category) would improve the quality of information collected and the estimations. A specific team would also



allow that regular inventories are available. For instance, the last GHG inventory for the country used the data from 2004. From 2004 to 2019, some tentative of GHG inventories have taken place but there is not yet official document released and publicly available on a new GHG inventory.

d) Weak process of verification of GHG inventory.

The first national GHG inventory report was produced by the University of Eduardo Mondlane and was commissioned by UN Environment. The process of verification consisted on a workshop for technical staff from the sectors to comment on the findings. As per the technical interview, sectors do not respond to the request for comments when the documents are sent to their own sector. To resolve this issue, technicians are convened into a meeting to discuss the results, or a presentation is scheduled for the technical council of the sector in order to gather comments.

Apart from sector comments, some lecturers at Eduardo Mondlane University are engaged for verification of information making use of the Memorandum of Understanding between the Eduardo Mondlane University and the old Ministry for Coordination of Environmental Affairs (MICOA). At international level, the UN Environment made a revision of the document to ensure the technical quality. However, there is a need for an independent revision conducted by the Mozambican institutions and following recommended procedures. Figure 4 below summarizes the main challenges faced in the past with the existing GHG inventory reporting system.

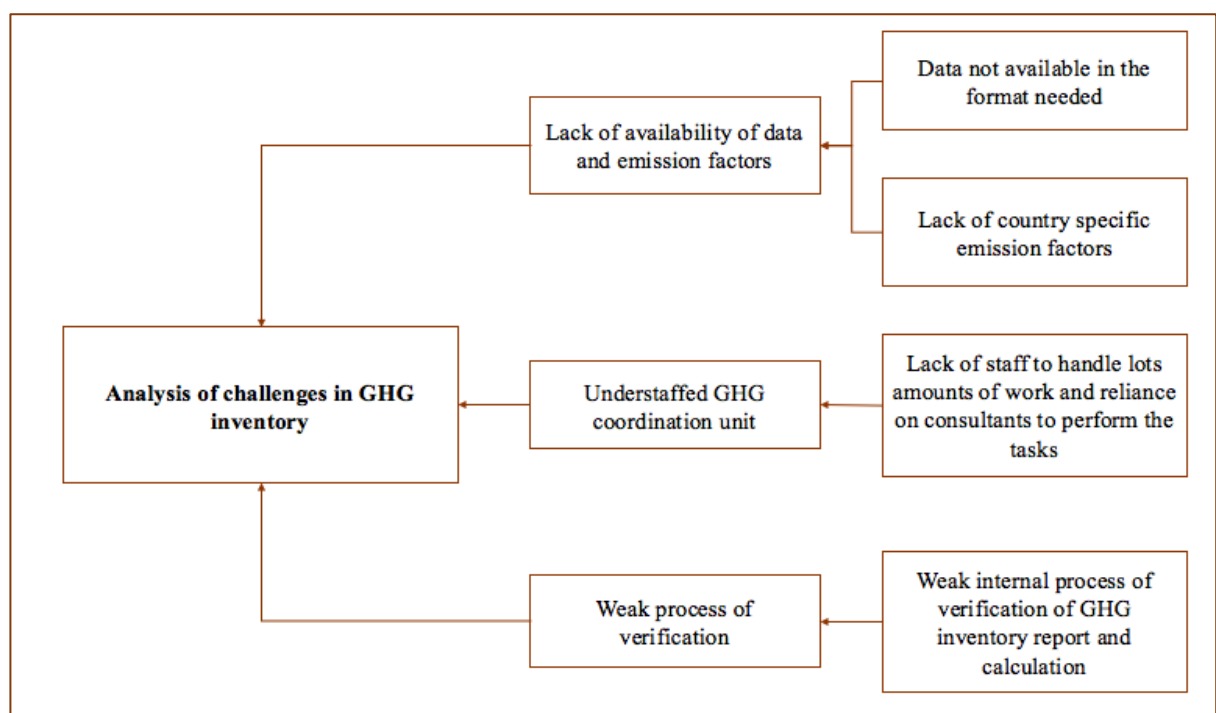


Figure 4: Summary of challenges for the preparation of GHG inventory (Source: Author)

3.4. National communication

3.4.1. Background



The first National Communication was prepared by the then Ministry of Coordination for the Environmental Affairs of the Government of Mozambique (MICOA) in 2003, and is available in the UNFCCC website. The Second National Communication has not been fully approved and officially published, but was being prepared by MICOA and dated 2011.

3.4.2. Institutional arrangements

The First National Communication of the country involved technicians from the following institutions: MIREME, MTC, MOPH, University Eduardo Mondlane, and NGOs (Environmental Working Group and Red Cross of Mozambique). In the FNC, climatic scenarios were developed using data from meteorological stations in the capital cities including Chokwé district, based on historical data from 1951 to 1980, and projections were made for 1975 to 2075 considering the doubling of carbon dioxide.

In order to prepare the FNC, an Inter-Institutional Group on Climate Change (GIIMC) was established, composed by representatives from government institutions, including:

- The members of the Vulnerability and Adaptation Group (composed by: National Directorate of Agriculture Services (DNSA), Mozambique Agriculture Investigation Institute (IAM), National Directorate of Forestry (DINAF), MITADER, MISAU, National Institute of Management of Calamities (INGC), and MOPHRH);
- Eduardo Mondlane University (UEM);
- Pedagogic University (UP), and
- The National Directorate of Energy of Ministry of Mineral Resources and Energy (MIREME).

The GIIMC was composed by sub-groups, namely the Vulnerability and Adaptation Group, the GHG Inventory Group, subgroup of Research and Systematic Observation, subgroup of Mitigation of GHG effects.

The Second National Communication (SCN) improved these arrangements by having a leading consultant who coordinates the group and the supporting team members from different institutions. The SNC report is masterminded at DINAB-MITADER that leads the process of report production. The process starts by creation of the groups according to their expertise. The Vulnerability and Adaptation Group has the responsibility of providing information to the team leader for production of information regarding vulnerability to climate change and how to adapt to it. The GHG Emissions Group, created through four branches of energy, industrial processes, agriculture, forestry and waste, provide the level of GHG emissions of the country. The Mitigation Actions Group is created to focus on those actions that will significantly contribute in reduction of GHG emissions, and the Research and Training Groups will build on the needs for further research and the type of knowledge needed to acquire. All this information is then summarized by the report coordination team, which has also the responsibility of developing the National Circumstances chapter. Once a national communication report is ready, it is discussed at the GIIMC for refinement and follows the steps of presentation to technical council (CT-MITADER), consultative council (CC-MITADER) and council of Ministers. The last step, under the responsibility of MITADER, is to submit the report to UNFCCC. Figure 5 shows the different institutions and institutional arrangements for the preparation and submission of the National Communication.

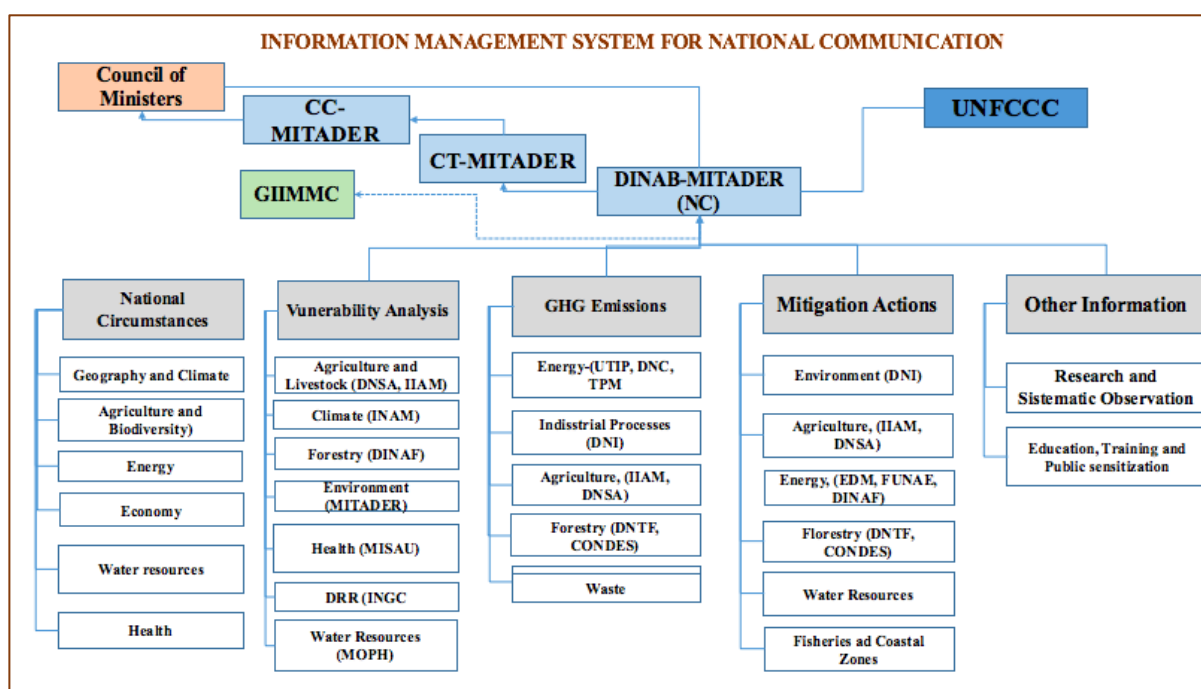


Figure 5: Institutional arrangements for preparation of NC (Source: Adapted from MICOA, 2011)

3.4.3. Information collected and sources of information

The National Communication collects information about GHG emissions to produce the status of the country in regards to mitigation and adapting to climate change effects. For the case of Mozambique, the following data in Table 7 below is collected from different institutions:

| Category of data required | Description | Institutions |
|---|--|--|
| National Circumstances | Geography, Demography, Health (Malaria, diarrheal, cholera, HIV), Topography, Economy (GDP), Water resources, Fisheries, Agriculture, Manufacturing Industry, Mineral. | INE MISAU MEF MOPHRH, MIMAIP MASA MIC MIREME |
| GHG emission | Last GHG inventory | MITADER |
| Vulnerability | Average air temperature, Temperature (Tmax, Tmin, Taverage), Rainfall, Wind, RH, Insulation, Floods and their effects, Droughts and their effects, Tropical cyclones and their effects, Scenarios of, Climate Change, Coastal areas and coastal resources, Water resources, Agriculture, Forests | MTC, INAM MAEFP-INGC MOPHRH MASA MITADER |
| Adaptation | Coastal resources, Water resources; Agriculture; Forests; Perspectives | MIPAIP, MOPHRH, MASA, MITADER |
| Mitigation | Measures to mitigate GHG emissions | MITADER, |
| Policies and measures to ensure the fulfilment of the UNFCCC objectives | Existing policies, Conventions, Measures taken for the implementation of UNFCCC | MITADER |



| Category of data required | Description | Institutions |
|--|---|--|
| Systematic Observation and Research | Climate databases (Satellite NOAA, NDVI, METEOSTAT, CLICOM) Investigation Research Necessary Assistance | MTC, INAM, MASA-IIAM, CLIMATE CHANGESTP |
| Public education and awareness raising | Formal education, Informal education, Other relevant information | MITADER, MINEDH |

Table 6.: Information required for the National Communication (Source: MICOA, 2011)

3.4.4. Mechanism for verification of information

The process of verification of the National Communication is as follows. The sectors receive the document for verification within the sector, and a full presentation is conducted in order to get more comments from the different sectors. In addition, a team leader from MITADER presents the same document in the technical council of the sectors where, information is verified again. The team of consultants can also be included in these consultations. The last internal verification mechanism consists of having the lecturers from Eduardo Mondlane University (UEM) and Pedagogic University (UP) to verify the information in the document. Once the document is ready internally it might go through an external donor verification process, especially before the payment of consultants. This process may require the country to submit the raw data used for the calculations for the donor to perform some analysis.

3.4.5. Challenges and barriers

The main challenges with the preparation of National Communications are the following aspects:

a) Poor GHG inventory and lack of emission factors

The NC depends highly on the level of the data from the GHG inventory because it will guide the level and intensity of the actions to reduce GHG emissions. The first GHG inventory was conducted in 2004 and used IPCC Tier I data analysis. There is a need to improve both the level of data collection and the specification of the emission factors for the country. On the other hand, there are no emission factors for the country (especially for the industrial processes and agriculture)

b) Data collection requires instruments that are not available

The NCs rely on specific data collection instruments and studies to establish the level and status of some indicators (air quality, wind, insolation, weather systematic observation, among other climatic parameters). In Mozambique, the majority or some these instruments do not operate in full, and those under operation are not permanently operational. There is a need to invest in climate measurement and control instruments in order to make robust NCs.

The different databases used to feed this NC are generally of low reliability (given the irregularity with which the data are generated) or mismatched to the nature of data required for this type of inventory. Across all sectors, it was found that lack of data was a major problem across all sectors. In the energy sector, there was a lack of disaggregation of data per sector especially when it comes to the petrol used. Even when information is available for some sectors (aviation, agriculture, transport),



there is a challenge in terms of separating between using fuel for the tractor as a mode of transport and using fuel for the motor pump as a purely agriculture activity.

When it comes to forest sector, the main issues under the forest sector are related with lack of constant data on frequent basis, and existence of variables with very slow change (stock on biomass) and the change of land from forestry to other type of land, lack of technology and resources to tackle bush fire. The forest sector also faces issues on the methodology for data collection where the framework for data collection is so big that when elaborated, some districts might fall out of the sample. This might result on miscalculation of the forest area and the forest species existent (MITADER-DINAF, 2019).

c) Weak level of information sharing

The country is characterized by a lack of mechanism for information sharing, such as online database, or an information sharing platform. Investing in a functional website or platform for information would be efficient for sharing and making national communication's instruments available for the majority of users. Alternatively, the Government can, at least, assure that a printed version is available since internet and webpage documents require investment that in many cases do not have sustainable funding

d) The responsible institution lacks a formal mandate and is understaffed

The NCs lie on the DMC for its production, dissemination and sharing. Nevertheless, the amount of work and the demand of this type of activities require a lot from the allocated staff. The few competent staff that the DINAB has are not enough to perform this type of work with the necessary level of detail and supervision. One of the options is to consider the creation of a project implementation unit, coordinated by DINAB staff. It is clear that such complex projects require dedicated, full time, committed staff for operationalization. On the other hand, NC elaboration require a great amount of coordination with other institutions. The staff collecting this mandate does not have any legal instrument for requesting information which they would quote or use when requesting information.

e) No requirement for NC be approved by the high-level government institutions

There is no legal instrument (decree, law) that mandates the sector to prepare and submit to the council of ministers or National Communication, as national document for approval. Despite the Council of Ministers being in the reporting structure of the NC, their mandate is on appreciation and the possible outcomes are: favourable or non-favourable, and approved or not approved. On the other hand, the NCs do not go through the Assembly of the Republic for its appreciation. The fact that the national communications do not have a legal instrument linked to it, makes that the process of monitoring of its development weak. Binding these important documents to internal legislation and increasing the power of the Council of Ministers and the legislators is an opportunity for the NCs to be taken in consideration in a stronger form.

Figure 6 below summarizes the barriers and challenges of the NC process in Mozambique.

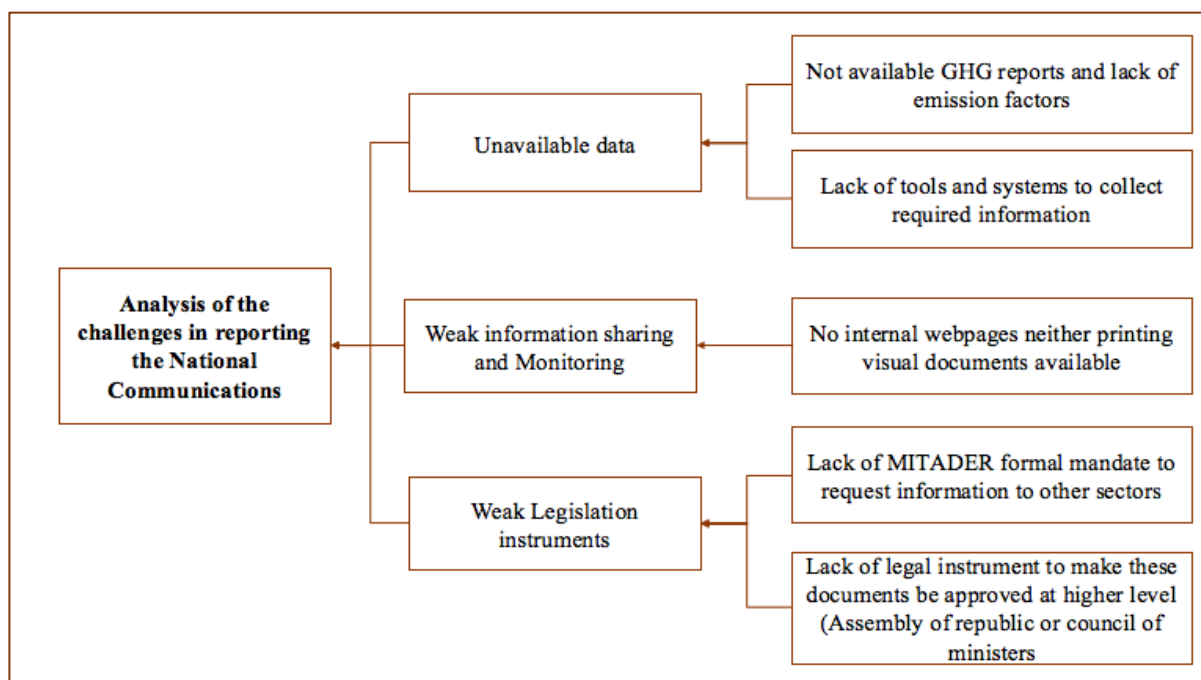


Figure 6: Summary of challenges for the preparation of National Communication (source: Author)

3.5. Biennial update report

3.5.1. Background

The BUR should include a national inventory report and information on mitigation actions, support received and support needs. Resulting from the ratification by Mozambique of the UNFCCC, the country is required to formulate and submit the BUR every two years. The reporting of the BUR was decided by UNFCCC in 2010, the BUR's content specified in 2011, and countries asked to report their first BUR starting from December 2014. In 2017, MITADER prepared and submitted to the UN Environment the project proposal for the formulation of the First Biennial Update Report (BUR), which was approved, so that the country should prepare and submit the first BUR by October 2019.

3.5.2. Institutional arrangements

The project for the formulation of the first BUR was launched in June of 2018, and relevant stakeholders are involved in the process of elaborating the first BUR. Institutions are mapped based on their role in defining, promoting and monitoring the implementation of policies, strategies and programs, and for their role in implementing actions on the ground and, therefore, holding the necessary information. For the current BUR, the country is involving public, private and academic entities, including individuals who hold the required information necessary for the formulation of BUR. This involvement was made through the GIIMC, is coordinated by the DINAB and is composed by the following sectors included in the figure 7 below.

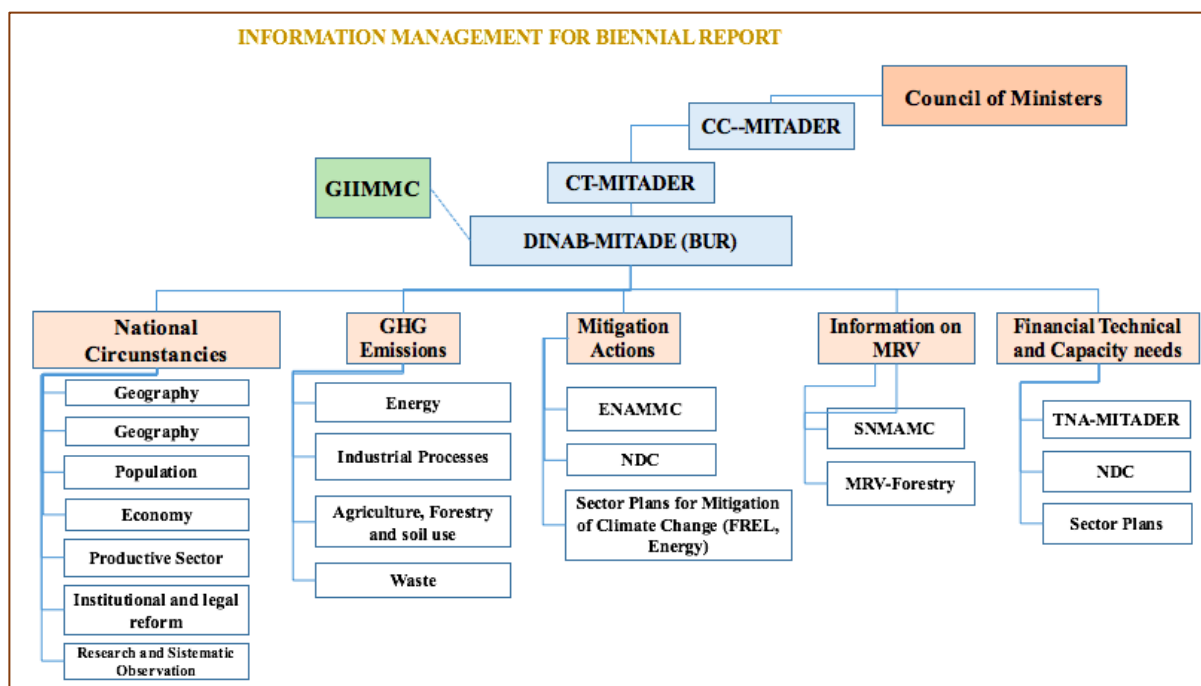


Figure 7: Institutional arrangements for preparation of the BUR (Source: Adapted from UNFCCC, 2018)

MITADER, has prepared and submitted for signature, a Memorandum of Understanding (MoU) with the main stakeholders in order to define the roles and procedures of each sector for the preparation of BUR reports to UNFCCC, and other climate related reports to be submitted to the Council of Ministers and to the UNFCCC. The MoU establishes the institutional arrangements that will allow Mozambique to prepare, on an ongoing basis, the national reports on climate change and other documents following the methodologies adopted by the UNFCCC.

The MoU states that the Ministry of Agriculture and Food Security (MASA), Ministry of Health (MISAU), Ministry of Industry and Trade (MIC), Ministry of Public Works and Water Resources (MOPHRH), and Ministry of Mineral Resources and Energy (MIREME) will coordinate the working groups). These sectors have the responsibility to collect information and estimate emissions and removals by the sinks of GHG and produce the GHG inventory report. Moreover, the academies must be involved in order to give their technical support and ensure a better technical-scientific quality. For this work, the Eduardo Mondlane University, through CEAGRE was entrusted the technical support to MITADER. In the following table 8, the specific type of information for BUR is presented

3.5.3. Information collected and sources of information

The BUR under elaboration and to be produced this year is expected to use information about the national circumstances, and link them with the SDG's, and the NDCs, update on the GHG emissions using the IPCC 2006 Guidelines, and build the basis for the Biennial Transparency Report. There will be an analysis of vulnerability and support with the estimation of GHG gas emissions. Based on the vulnerability analysis, there will be proposed mitigation actions, policies and guidelines. The academia will be useful at this stage with its research contribution. The following Table 8 presents the components of the BUR and the institutions that will provide the required information.

| Category | Description | Sectors involved |
|---|--|---|
| National Circumstances (linking National development priorities and sustainable development goals) | Geography, Demography (Population Climate, Economy, Biodiversity Health (Malaria, diarrhea, cholera, HIV), Topography, Economy, GDP, Water resources, Fisheries, Agriculture, Manufacturing Industry, Mineral | INE, MITADER, MISAU, MEF, MOPHRH, MIMAIP, MASA, MIC, MIREME |
| Total GHG emission from the last GHG inventory (same process as done in GHG emission calculation) (using IPCC2016 guidelines) | Energy Industrial processes LULUCF Waste | MITADER and INE |
| Vulnerability | Average air temperature Temperature (T-max, T-min, T-average) Rainfall, Wind, RH, Insulation, Floods and their effects, Droughts and their effects, Tropical cyclones and their effects, Scenarios of climate change, Coastal areas and coastal resources, Water resources, Agriculture, Forests | MTC-INAM, MAEFP-INGC, MOPHRH, MASA, MITADER |
| Mitigation actions | Measures to mitigate GHG emissions | MITADER |
| Policies and measures to ensure the fulfilment of the UNFCCC objectives | Existing policies Conventions Measures taken for the implementation of the UN convention on climate change | MITADER |
| Systematic Observation and Research | Climate database (Satellite NOAA, NDVI, METEOSTAT, CLICOM) Investigation Research (Agro-climatology, Agricultural species, climate studies, adaptation studies, environmental education) Necessary Assistance (education, Research, knowledge transfer, monitoring, reporting and verification) | MTC-INAM, MASA-IIAM, CLIMATE CHANGETESTP |
| Public education and awareness raising | Formal education Informal education Other relevant information | MINEDH |

Table 7: Information to be collected for the BUR (Source: UNFCCC, 2018)

3.5.4. Mechanism for verification of information

The process of development of the BUR face the same challenges of the NC since they are similar documents. The mechanism for verification of information will include verification of information about the GHG calculation (by the sector team participants and lecturers from the universities), and get support from UN Environment. The document might be submitted to the Academy of Science of Mozambique or to the Ministry of Science and Technology for further analysis.

3.5.5. Challenges and barriers

The main challenges with the BUR is related to the following aspects:

a) Lack of complete data for elaboration of GHG inventory

The BUR depends on data from the GHG inventory. The first GHG inventory was conducted in 2004 and used the IPCC 1996 guidelines and was based on Tier-I data analysis. There is a need to improve



both the level of data collection and the specification of the emission factors for the country. Since the country does not have updated information of the GHG inventory yet, the country will be engaged to develop the GHG emissions and produce a BUR report. This will require double effort from the sectors. On the other hand, the quality of the BUR will be affected by the quality of data.

b) Lack of experience in elaboration of BUR reports for the country

The current BUR is the first for the country. Obviously as a learning exercise, there will be challenges related to the process. Support from national and international organizations will be crucial for the quality of the BUR and for the improvement of the future BTR reports.

c) Lack of data and challenges in data sharing systems

The process of development of BUR relies heavily on data to be shared by other institutions/sectors. The data sharing mechanism in the country depends on superior authorization, or is based on friendship for data sharing. There is a need to develop a formal, professional and systematic information sharing mechanism for climate change information.

In recognition of the challenge, the National Directorate of Environment (DINAB) is proposing an MoU between the main institutions working on climate change. However, the delay in the signature of the MoU, is forcing MITADER to change the institutional arrangement. The current approach states that the sectors have the responsibility to calculate the levels of emissions and supply to MITADER. This approach is being unsuccessful because sectors nor do not have the knowledge or do not have the mandate to estimate the GHG emissions based on secondary data. Under the new MoU under preparation, sectors will only share the information that they collect with MITADER, who will be responsible for estimating emissions and removals by sources of GHG, and subsequently submit the results to the institutions that provided data for comments. The comments from the sectors will return to MITADER for production of the greenhouse gas report and submission to UNFCCC.

d) Limited knowledge from of Government staff to support the reporting process

In Mozambique, there are few staff who can clearly articulate the aspects of estimation of GHG, write reports in English and conduct specific analysis. It is important to recognize that there are few qualified staff, for the high demand of this type of analysis. Therefore, the process of reporting to UNFCCC still relies on independent consultants coordinated by the DMC, which is busy by many other working demands from the government. A dedicated office coordinated by the DMC, with full time employed technicians that train the government staff on a constant basis is needed for the development of an efficient monitoring, reporting and verification to UNFCCC. This is in line with the new modalities, procedures, and guidelines of the enhanced transparency framework, which state the need for establishment and maintenance of systems to allow for the production of these reports on a continuous basis e.g. : *"Each Party should implement and maintain national inventory arrangements, including institutional, legal and procedural arrangements for the continued estimation, compilation and timely reporting of national inventory reports in accordance with these MPGs"*. Figure 8 below summarizes the challenges in preparing the BUR report.

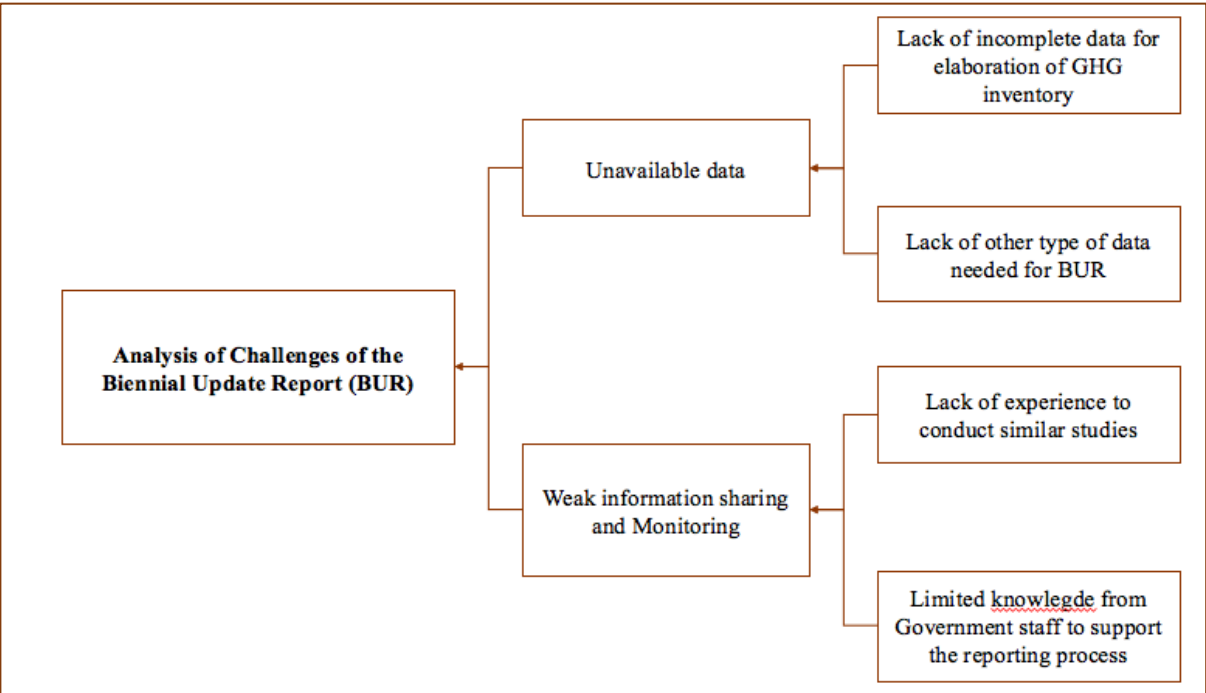


Figure 8: Analysis of the BUR challenges (Source: Author)

4. Reporting on Greenhouse Gas Emissions by Private Sector

4.1. Relevant private sector stakeholders

The private sector is crucial for the success of reporting to climate change because their activities generate GHG emissions, and the data reported in the GHG inventory will improve significantly if the private sector reports their data. Currently MITADER develops very strong linkage with the Business Forum for Climate Change (FEMA⁵-Fórum Empresarial do Meio Ambiente) and the Confederation of Economic Association (CTA⁶-Confederação das Associações Económicas) for participation in workshops, provision of feedback from the private sector and in bridging a gap between the private sector and the government. These two institutions participate in meetings with MITADER and they take the information and request to their meetings and provide feedback. These two institutions have a representations are recognized by the government as institutions for collaboration on climate change matters. However, to date, these two institutions are not yet collecting information to feed the GHG metrics.

The following are the private companies that provide information for the climate change reporting on climate change. The main form of information in Mozambique is the official documentation from the National Institute of Statistics (Statistical Yearbooks, Agriculture and Population Census). The importance and participation of the private sector is very important for effective data collection and efficient process of estimation of GHG emissions. On the other hand, the country has a process where by some private big companies have to report their production on annual basis. Through this system, INE produces the statistical yearbooks (Table 9 below).

| Sector | Unit | Explanation | Source |
|--------------------------|--|---|--|
| Agriculture and Forestry | Farmers | Cow manure, rice production areas | Statistical Yearbook, Agriculture Census |
| | Wood companies Association | Association of Wood Companies of Mozambique | Statistical Yearbook |
| | Poultry production | Emissions | Statistic Yearbook |
| Industrial Processes | Mozal | Aluminium melting company | Primary data |
| | Coca-cola company | Emission from production | Primary data |
| | Mozambique Cement company | Clinker | Primary data |
| | Carbomoc Company | Fugitive emissions | Primary data |
| | Sugar | Emissions from production | Statistical Yearbook |
| | Alcoholic drinks, Glass companies, Steel companies, margarine/cooking oil, cookies | Emission from production | Statistical Yearbook |
| Energy | PETROMOC, BP, Mobil, TOTAL | Fuel consumption | Primary data |
| Waste | Municipal data | Waste production | Population Census, Primary data |

Table 8: Data supplied by Private sector for GHG estimation (Sources: MICOA 2003, MICOA 2011)

⁵ FEMA includes more than 50 big members including: Coca-cola company, Mozambique Electricity Company, Hydroelectric of Cahra Bassa, Pintex, Consultec engineering, CETA engineering,

⁶ CTA is a confederation of associations with 127 companies registred, and have institutions from the following economic areas (Banking, Mineral resources, agriculture, tourism operators, sugar cane producers, construction, transport, commerce chambers,



Although the country has developed tremendous effort in collecting statistic information, there is a long way to improve in terms of improving data collection that would allow estimation of the GHG emissions of the private sector, and estimation of the private sector impact on adaptation options. For instance, the production of chicken is growing in Mozambique and the enteric fermentation from chicken is something to consider. This data need to be accounted for. On the industrial side, several small industries are functioning producing pots and other equipment and produce and emit GHG emissions, but they are not reporting. Similarly, with the production of alcoholic beverages, small to medium companies can have an impact in GHG emissions specially the alcoholic brewing companies throughout the country, and accounting and measuring their impact is essential.

In summary, the government should either structure the reporting system to ensure that all companies are accounted for in their statistical data collection, or create a system through local governments and associations to gather information that can contribute to a more efficient data collection system.

4.2. Information collected and sources of information

Governmental rules through the Law 5/96 of the 5 of June, preconize that private sector enterprises must provide information to the National Institute of Statistics (INE), which accumulates and analyses through the statistical Yearbook and other initiatives. In some cases, INE collects information through surveys that covers the majority of private sector indicators. The two private sector associations collect information from the sectors for their own reporting as well as for reporting to some similar functions at international level. On the other hand, MITADER also collects information from these institutions as well as the Ministries and from public sector where applicable. The fact that various institutions collect data from same sources might, in some cases create confusion to the institutions and create resistance to provide information, especially when institutions are blamed for providing different figures to different institutions.

CTA and FEMA can play a crucial role by engaging sectors for information required and collecting this information from these sectors. While CTA is a group of associations, FEMA is a group of companies that recognize that they could have impact on climate change. The two groups of institutions play different roles as one group works more on doing business models while the other group focus on collaborative effort on climate change. Efforts to make FEMA as part of CTA are in progress with some member companies suggesting independence and others suggesting FEMA as a unit of CTA. Linking FEMA with CTA would be an advantage for FEMA because FEMA would benefit from the robust financial structure of CTA and the visibility of CTA, as well as the structure and linkages with members. On the other hand, CTA would benefit from FEMA strong environment knowledge. As decisions are made in a collegial form, FEMA still remains a standalone forum with strong linkages to CTA.

4.3. Challenges and Barriers

Private sector represents an important segment to data collection and reporting. The process of data collecting in Mozambique is very well structured for big enterprises, and requires an improvement for small medium enterprises. The following are the barriers to private sector reporting:



a) *Existence of different layers for collection of similar information.*

Private sector reports to relevant ministries and to the INE and in some cases to MITADER. For instance: a private sector agriculture company would provide information to MASA, as well as to the INE. Information in agriculture sector, that has impact on environment, is requested by more than one ministry. Reducing the reporting layers and making sure that private sector is organized in a way that reporting is efficient. Unfortunately, these rules are not being strictly observed in Mozambique as different institutions collect information on their own timing. Making sure that the information sharing mechanism is operational and efficient is an opportunity in establishing a national MRV system. There is a need to adjust the criteria about who collects what type of information and using which approaches.

b) *Lack of formal obligation of the sectors*

Most private sector companies, especially the small and medium enterprises do not have requirement to report climate change information. Currently, there is no legal instrument that requires the small and medium enterprises to report climate change information on regular basis.

c) *Lack of knowledge in terms climate change data requirement*

Climate change is becoming more demanding in terms of information and in terms of reporting, especially after the Paris agreement. Many private sector companies do not have the necessary specific skills about the type, and quality of information requires to collect and report. There is a need to train private sector about the type of information required. The CTA and FEMA are good platforms for such training. The main beneficiary of the information (MITADER) can take a lead in provision of such type of training, in partnership with Non-government organizations, civil society, United Nations, multilateral organizations or bilateral organizations.

d) *Lack of financial incentive to conduct such extra work that does not have direct linkage with profit;*

Private companies are guided by the profit. They are more interested in collecting information that is linked to their income. Information that is considered good for environment and that is not directly linked to their profit and that requires investment is not collected. Government can consider several options that include attribution of climate friendly certificate, reduction on a percentage of a tax that the company must provide to the government, priority when requesting authorization for some services provided by the government, and opportunity to be supplied information by the government free of charge or at discounted rate. Alternatively, the government can set all the rules for the companies during the process of registration of the business making data provision as compulsory and ensuring the necessary penalties in case of non-accomplishment.



5. SWOT Analysis of the current national MRV system

The country is committed to supply reports on monitoring, reporting and verification of climate change to UNFCCC. Internally there is evidence of efforts to MRV through development of SNMAMC and partnerships that the country has established for effective reporting, as for example the World Bank has supported in development of the SNMAMC, and of the CPEIR, the UNDP has supported the development of the PEER, UNEP is supporting the development of the MRV framework for improved reporting. The current system has strengths, weaknesses, opportunities and threats. The following table 10 presents the SWOT analysis.

| Strengths | Weaknesses |
|---|--|
| <ul style="list-style-type: none"> -Existence of SNMAMC, for climate change mitigation and for adaptation; -Elaborated two national communications; -Elaborated three GHG inventories of GHG emissions; -Elaborated one report on adaptation and mitigation on climate change (the SNMAMC report); -Available Technology Needs Assessment report; -Creation of climate change unit to deal with climate change in the country; -Creation of an institutional group for climate change (GIIMC) and keeping it active to date. -Very strong linkage with the academia (University); -Growing leadership and political will to tackle climate change; -Elaborated two reports on climate expenditures. -Availability of funds (GEF) to support BUR and NC reporting | <ul style="list-style-type: none"> -The SNMAMC not being periodically reported -Lack of submission of country reports on BUR and NC; -Challenges in documentation and information sharing mechanism (webpage, documentation); -Lack of detailed baseline data for sectors in the NDC; -Challenges in availability of information for GHG calculation; -Lack of internal capacity to conduct GHG reports; -Limited funding for internal data collection and reporting of climate change data; -lack of national emission factors; -weak process of verification of GHG emission results; -lack of experience for elaboration of BUR in the country; -non or malfunction of the academy of science to perform quality assurance and climate studies -lack of institutional capacity to collect data at all levels; -Dependence of the country to donors to produce internal reports (GEF) -limited of Private sector reporting on climate change. -Lack of private sector training on environment and climate change requirements |
| Opportunities | Threats |
| <ul style="list-style-type: none"> -Existence of United Nations, the World Bank and Non-Government Organizations that can support the creation of the basic monitoring frameworks; -Existence of experienced staff with huge knowledge on climate change and large experience; -Creation of knowledge management center of climate change; -Existence of MoU between the Government and the Academia; -Existence of the National Fund for Sustainable Development (FNDS) as an institution that can manage climate change finance. -Existence of some structures of private sector (CTA and FEMA) that can support the process of reporting in the country | <ul style="list-style-type: none"> -Poor coordination mechanism between government institutions on climate change matters; -lack of instruments and technical equipment for proper measurement of several indicators (air quality, wind, etc) needed in the country for proper reporting; -lack of ownership or recognition by the institutions of the importance of reporting to UNFCCC; -Concentration of all the UNFCCC reporting and communications to a single person in a department and not in a cross sectoral unit -limited involvement of the higher government officials in UNFCCC reporting issues. |

Table 9: SWOT analysis of the current MRV system (Source: Author)



6. Future requirements of MRV system

This section will focus on the Modalities, Procedures and Guidelines (MPG) for the transparency framework for action and support referred to in article 13 of the Paris Agreement and assess the capacity of the country to comply with these conditions.

6.1. The MPG of the Enhanced Transparency Framework of the Paris Agreement

The Conference of the Parties, at its twenty-fourth session, recommended the following draft decision for consideration and adoption by the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement at its first session: *Modalities, procedures and guidelines (MPG) for the transparency framework for action and support referred to in Article 13 of the Paris Agreement*. The MPG orients the parties to submit their first biennial transparency report (BTR) and national inventory report, if submitted as a stand-alone report, in accordance with the MPG, at the latest by 31 December 2024. Countries shall submit the subsequent BURs every 2 years.

The MPG's main purpose is to provide a clarity and tracking from the parties of progress towards achieving Parties' individual nationally determined contributions (NDCs). The second objective is to provide clarity on support provided and received by relevant individual Parties in the context of climate change actions and, to the extent possible, to provide a full overview of aggregate financial support provided, to inform the global stock-take.

6.2. Additional challenges and barriers

The Modalities, Procedures and Guidelines can be summarized as a Biennial Transparency report. This report is a form of ensuring that communication is made to the Conference of the Parties (COP) on information relevant to the implementation of the Paris Agreement. This reporting allows to understand ambition and progress on climate actions and support provided by Parties – and informs the COP deliberation and guidance on these matters. The components of the BUR are the following:

- a) A national inventory report of emissions by sources and removals by sinks of GHG;
- b) Information necessary to track progress in implementing and achieving its NDC;
- c) Information on climate change impacts and adaptation;
Information of financial, technology transfer, and capacity-building support needed and received.

6.2.1. Requirements related to GHG Inventory

The summary of issues to be resolved under the new MPG guidelines are summarized in table 12 below. Under each category critical aspects are identified that could support the development of better information and improve the reporting.

- Under the National circumstances, strengthening the institution/sector leading the coordination of GHG inventories would allow effective reporting and higher commitment to the GHG inventory. The country can also get support in development of the emission factors for each sector or for the most relevant in GHG contribution.



- Under the methods, main concern is in updating the IPCC1996 to IPCC2006 guidelines. This means recalculation of the previous NCs that the country has conducted. The second constraint lies on having consistent data and time series. Both the first national communication and the second national communication have clearly identified the data that is not available. Finally, the process of quality assurance and quality control can be institutionalized with formal reports on the quality and recommendations for improvement.
- On the metrics, time series is a big concern. There is a need to support both the INE and the sectors in collecting and storing data consistently (100 years), and the National Institute of Statistics to find out which information can be collected and processed on constant basis, at lower cost. There is also a need to work with sectors to improve the reliability of data collected and the consistency of the methods. For instance: information on cow manure produced, hospital material incinerated, waste generated, source of electricity supplied to the country by the Republic of South Africa, is all based on estimate.
- On reporting, there is no regular reporting of NCs and BURs. Improving a mechanism for approval of reports to be submitted to the UNFCCC is necessary, and also making these reports available in the national language. Creating and building capacity of a reporting unit is essential.

| ANALYSIS OF THE MPGs FOR THE GHG INVENTORIES | |
|--|---|
| <i>National circumstances and institutional arrangements</i> | <i>Methods</i> |
| <p>The country has produced 2 GHG inventories, however the following is needed:</p> <ul style="list-style-type: none"> - support in strengthen national entity and national representation for GHG inventory by attributing more power or engaging Vice Minister to coordinate the GHG inventory - support in development of emission factors -support in update and revise information in the 2NC from 1996 IPCC to 2006 IPCC -support in ensuring more intentional information sharing and approval process of the GHG inventory | <p>The country needs support for the following methods</p> <ul style="list-style-type: none"> -Support in usage of 2006 IPCC guidelines -Support in development of the emission factors -Challenges in having consistent data on time series with consistent data collection methods (Forestry) -challenges in developing consistent GHG information -Quality assurance and quality control needs to improve including engagement of QA/QC technical expert team. |
| <i>Metrics</i> | <i>Reporting guidance</i> |
| <p>The country can report aggregate emissions and removals using the existing IPCC 5th Assessment Report</p> | <ul style="list-style-type: none"> -the country still reports on 3 out of 7 gases to be reported upon -Data in four sectors (Energy, Industrial processes, agriculture and Waste) is collected from different type of sources with different level of reliability. -The country is not yet properly reporting (in separate lines) for international aviation and marine bunkers -The country does not have consistent information for a time series from 1990. <p>The country has challenges in having information up to 2 years before the GHG inventory (last official data on census in 1997, last official data on Agriculture Census is from 2010)</p> |

Table 10: Main challenges in reporting GHG inventories with a new MPG instrument (Source: Author)

6.2.2. Requirements related to tracking the NDC

The NDC of the country appears to be very strong and with plenty of activities. It lists a majority of the needs of the sectors in a very specify manner. However, the needs focus a lot on the sector specific needs rather than on their actions to tackle climate change. On the other hand, the sectors do not quan-



tify each activity in terms of the impact on GHG reduction. The actions also do not have baseline or non GHG benefits. The summary of the issues to improve can be found in table 13 and Figure 9 below:

| ANALYSIS OF THE MPG REQUIREMENTS RELATED TO THE NDC | | | |
|---|--|--|---|
| A. <i>National Circumstances and Institutional Arrangement-</i> | B. <i>Description of the National Determined Contribution</i> | C. <i>Information necessary to track progress made in implementing and achieving its nationally determined contribution</i> | D. <i>Mitigation policies and measures, actions and plans including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans related to implementing and achieving NDC-</i> |
| <p>The National circumstances are possible to reports, however the following challenges exist:</p> <ul style="list-style-type: none"> -the Memorandum of understanding between the institutions is elaborated for sharing information and it not ready yet -NDC indicators identified but they do not have a baseline value -NDC indicators without an indication of the potential GHG reduction | <ul style="list-style-type: none"> -Current NDC using IPCC 1996 guidelines and on the way to be updated to 2006 IPCC guidelines -NDC based on policy implementation and not clear baseline and target identified per activity, but overall target calculated for the country | <ul style="list-style-type: none"> -indicators to track the progress of NDC available but not enough detailed or discriminated per activity. -Only one sector (Forest) with detailed information to track progress based on the current existent studies developed. - need to continue supporting sectors in developing specific studies for policies (such as REFIT, impact of vegetable coal production) -need for studies about other mitigation policies and measures where the country can improve in estimating the co-benefits and the impact of inaction | <ul style="list-style-type: none"> -very good identification of the actions in the NDC including the budget necessary to operationalize, but costs still presented as estimates and not as real costs -Country still to develop the mitigation benefits and the co-benefits for the policies to be implemented. Currently a study on vegetable coal and Refit is being prepared as part of ICAT project |
| E. <i>Summary of GHG emissions and removals;</i> | | F. <i>Projections of GHG emissions and removals, as applicable-</i> | |
| <p>-consists of a summary to be presented in this section, which is only applicable if the country is submitting stand-alone national inventory report</p> | | <ul style="list-style-type: none"> -limited availability of projections for all sectors (forest sector have projections up to 2030, and energy sector is developing the projections). -there are no projections per mitigation action or policy proposed in the NDC | |

Table 11: Main challenges in reporting about the implementation of NDC (Source: Author)

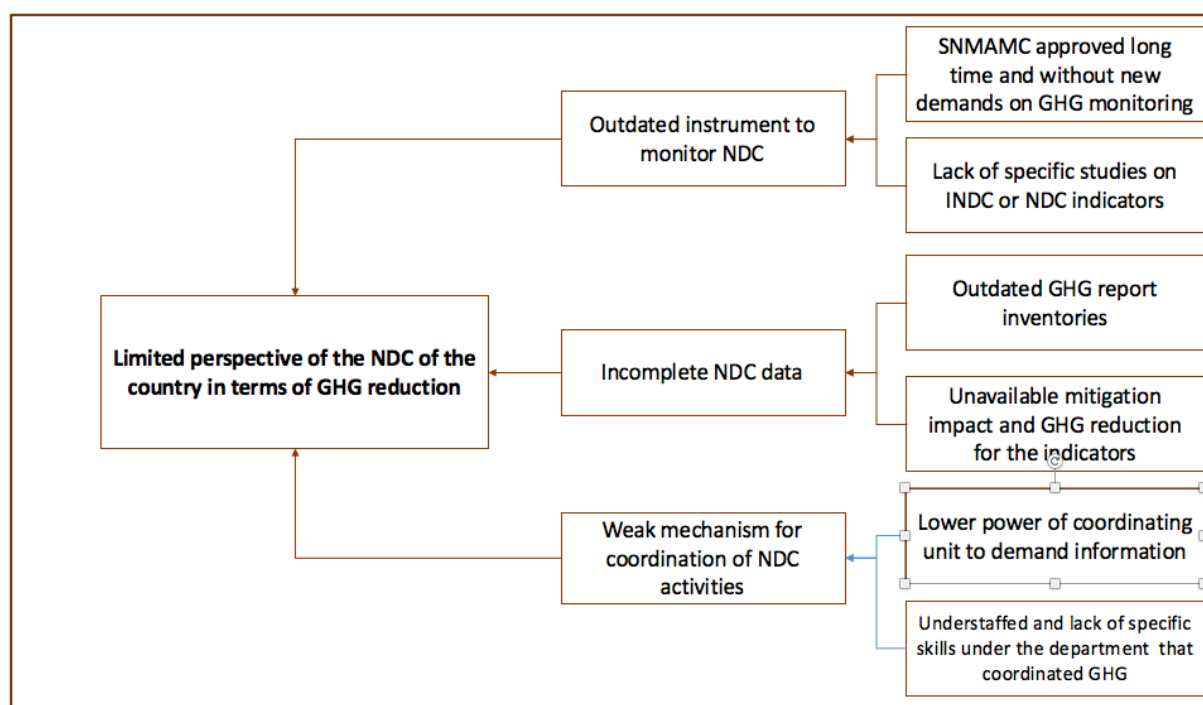


Figure 9: Challenges for tracking the implementation of the NDC

6.2.3. Requirements related to climate impacts and adaptation

The SNMAMC mandates the country to report, on annual basis, to the Council of Ministers, the action taken towards adaptation and mitigation of climate change in Mozambique. This important exercise demonstrates the efforts on adaptation and on mitigation. The exercise is similar to the one in FCCC/CP/2018L.23 of the UNFCCC that states that each country should provide information related to climate change impacts and adaptation under article 7 of the Paris agreement, as appropriate. While this information is not mandatory under the ETF of the Paris Agreement, the country has made it mandatory, given the vulnerability of the country to climate change. The process of reporting the climate impacts and adaptation is presented in table 14.

| ANALYSIS OF THE MPG REQUIREMENTS FOR THE CLIMATE IMPACTS AND ADAPTATION | | |
|---|--|---|
| A. National Circumstances, institutional arrangements and legal framework | B. Impacts, risk and vulnerability, as appropriate | C. Adaptation priorities and Barriers |
| -challenges in defining what adaptive capacity is and how to measure in Mozambique context. - | -available climate risks with little details -non available estimate of the vulnerability index -overlap of institutions in assessment of vulnerability (INGC, MITADER, MEF) which implies the need for improvement of institutional arrangements; | -the country has adaptation measures developed through the Local Adaptation Plans. However, the following issues prevail: -Lack of system to monitor the level of implementation of the Local Adaptation Plans -Poor documentation of the approved Local Adaptation Plans |
| Adaptation strategies, policies, plans, goals, and actions to integrate adaptation into national policies and strategies- | Progress on implementation of adaptation;- | Monitoring and Evaluation of adaptation actions and processes; |



| | | |
|--|---|---|
| <p>-The country is rich in terms of strategies, plans, guidelines. The main challenge is on operationalization of the plans. For example:</p> <ul style="list-style-type: none"> -difficulties in allocating budget for the Adaptation measures planned in the LAPs -Challenges in alignment of the Local Adaptation Plans with the planning cycle -Challenges in involving different stakeholders in the process of Adaptation | <p>-Lack of reporting to SNMAMC weak coordination of reporting of adaptation between different institutions (INGC, MITADER, NGOs)</p> | <p>-Lack of funding for implementation of the SNMAMC which includes information on Adaptation and Mitigation; -Lack of technical expertise (personnel) to implement the SNMAMC; -Weak internal capacity to monitor progress on implementation of adaptation</p> |
| <p><i>Information relates to averting, minimizing and addressing loss and damage associated with climate change impacts</i></p> | <p><i>Cooperation, good practices, experience and lessons learnt-</i></p> | |
| <p>-Limited availability of resources and studies on climate change impacts, and linkages between science and potential impacts</p> <ul style="list-style-type: none"> - The country needs support for implementing activities related to minimizing loss and damage, in partnership with INGC. | <p>-The country has the knowledge management center of climate change, but has very limited resources, and weak capacity for publication of climate change results</p> <ul style="list-style-type: none"> -Inexistence of dedicated information sharing mechanism for climate change | |

Table 12: Summary of the Future challenges for the new MPGs related to adaptation communication (Source: Author)

6.2.4. Requirements related to information about support needed and received.

With respect to reporting on the financial technology development and capacity building received, the country relies on these two instruments (CPEIR and PEER). On the other hand, the following instruments provide the support needed (ENAMMC, NDC and TNA). The PEER mapped the support received from 2005 to 2010 and is currently being updated in this year 2019. The CPEIR mapped the support received from 2009 to 2014 and is also in the process of extension up to 2017. The financial and capacity building needs were first mapped in the ENAMMC in 2012 and then, the Technology Needs Assessment (TNA) were mapped in 2017 and the Nationally Determined Contribution (NDC) on climate change also brings the support needs and the document was published in 2019. Finally, the capacity building needs for reporting are currently being mapped in this ICAT document. Specific needs per category are included in table 15 below.

| ANALYSIS OF THE MPG REQUIREMENT FOR THE INFORMATION ON FINANCIAL, TECHNOLOGY DEVELOPMENT AND TRANSFER AND CAPACITY-BUILDING SUPPORT NEEDED AND RECEIVED | | |
|---|---|---|
| <i>National circumstances, institutional arrangement and country driven strategies</i> | <i>Underlying assumptions, definitions and methods</i> | <i>Information on financial support needed by developing country Parties</i> |
| <p>Existence of SNMAMC, PEER, CPEIR, E-SISTAFE to track finance and policy</p> | <p>CPEIR used the World Bank methodology to assess the centralized and decentralized climate change investments in the National State Budget.</p> <p>-PEER focus on Government state budget, on incomes and Donor investment developed by the United Nations Development Programme.</p> | <p>To be extracted from ENAMMC and TNA documents</p> |
| <i>Information on financial support received</i> | <i>Information on technology development and transfer support needed by</i> | <i>Information on technology development and transfer support received by</i> |



| | <i>developing country Parties</i> | <i>developing country Parties</i> |
|---|---|--|
| To be extracted from the CPEIR and PEER | Information available in the TNA developed for the country | To be reported in relation to the implementation of the NDC |
| <i>Information on capacity building support needed by developing country Parties</i> | <i>Information on capacity building support received by developing country Parties</i> | <i>Information on support needed and received by developing country Parties for the implementation of the article 13 and transparency related activities including transparency related capacity building</i> |
| To be determined in the NDC and in the MITADER ICAT document | To be extracted from the NDC report, SNMAMC | To be developed from ICAT report |

Table 13: Requirements related to information on financial, technology development and transfer and capacity-building support needed and received (Source: Author)



7. Summary of challenges and barriers for a robust national MRV system

The following are the key general elements that can improve the MRV system of climate change in Mozambique.

a) Delays in the delivery of the major process.

Most processes have their submission periods delayed. For instance, the second national communication was due in 2007, the SNMAMC is annual document but there is only one document produced in 2017, BUR is biennial document that was supposed to be released since 2014 but the country has none, the NAP is delayed now almost a year. These delays affect the country's ability to have a robust MRV system.

b) Different MRV systems do not communicate.

The different MRV systems do not use information from each other and there is no linkage of information. Each instrument is seen as stand-alone instrument with limited usage of other information produced by other instruments. For instance, there is no linkage between the GHG information collected through FAOSTAT and the information provided by the MITADER through the National Communications.

c) Different statistics development power.

While some systems (NFI, GHG inventory for energy sector) have wide range of information and wide range of official data, other system (NAMA for waste sector, NAMA for Agriculture, NAMA for sustainable charcoal) are limited in terms of data availability and official statistics.

d) Lack of data for major national instruments.

The systems do not have databases and do not have systems that allow constant reporting. Both the SNMAMC and the financial monitoring system (PEER and the CPEIR) are documents that require constant reporting but complete information to produce these reports is not available. These reports have been elaborated with minimum information and there is a need to improve the quality and comprehensiveness of the information.

e) Limited responsibility over the indicators in the MRV system.

While this MRV systems are considered National Systems, they are being coordinated by one sector. The sector coordinating the data collection and reporting face challenges in terms of commitment, information supply, flexible and effective attendance.

f) Lack of centralized database for Government and Non-government projects.

There is a need to have a system that communicates with government and non-government initiatives. The fact that different government institutions do not supply information to each other, similar with the linkage government and non-government and government and private sector institutions is weak affects the capacity of the country to have a robust MRV system.



8. Initiatives and Projects with MRV activities

There are currently several initiatives with MRV activities within different institutions. The current framework shows that there is a potential for joining efforts and creating synergies for an effective reporting process to climate change mechanism. This section describes the ongoing initiatives and projects.

8.1. MRV System for REDD+

The National Fund for Sustainable Development (FNDS) REDD+ Monitoring and Evaluation system is a system that used information from the National Forestry Inventory and a GIS database to monitor the estimate deforestation and land degradation. This system allowed the estimation of the forest reference emission level that is used to provide information about the level of emissions and the level of CO₂ targets based on the forest and land management. The MRV for REDD+ constitutes an important tool for the process of MRV in Mozambique. The issues of deforestation and land degradation is an opportunity for the country to support the development of GHG emission report and to include in the planning process. Thanks to the quality information collected by the REDD+ team, the national GHG inventory can use this data for the forest sector. The first National inventory was produced in 1990, the second in 2002, and the third in 2018. This last GHG inventory had a particularity of using similar methodology regardless of being supported by different institutions (the World Bank and Japanese International Cooperation Agency).

8.2. Food and Agriculture FAOSTAT

The Food and Agriculture Organization of the United Nations (FAO) collects information about Mozambique's emissions in agriculture sector. FAO uses a series of data on annual basis for the emissions. FAO data is used for comparison with the GHG inventory produced by the sector. However, effective data collection and sharing would improve the process of GHG inventory and reduce the burden of two different calculations. The Government is not currently using these information because some of the information is based on estimates and although the source of information is the government of Mozambique, the methodology used to collect information is not aligned with the other used in the GHG inventory that is submitted to UNFCCC.

8.3. Operationalization Plan of the NDC

The Mozambique Nationally Determined Contribution (NDC) is a guiding document where all sectors commit to actions aiming contributing for the reduction of GHG effects. The NDC operationalization plan development and monitoring is coordinated at the MITADER at the climate change department. The Operationalization Plan of the NDC proposes a set of country's commitments from 2020 to 2025 for the sectors agriculture, water, energy, early warning system and transport. The NDC is important because it allows countries to plan for actions under adaptation and mitigation based on the available resources and their capacity of implementation. As an effort to implement the operationalization plan of the NDC, MITADER conducted a support need exercise, where almost all the sectors requested strengthening of the MRV system. This is a recognition that more can be done in terms of the capacity of collecting, store and analyzing data and a lot can be done in terms of upgrading from tier-I to tier



II, and including other sectors such as private sector and small enterprises and the informal industry. The NDC and its operationalization plan has been approved by the council of Ministers on December 11th 2018 and is financed by the NDC Partnership Support Facility and the World Bank group. The NDC Partnership Support Facility in Mozambique developed a 3 year operationalization plan from 2018-2021.

8.4. Energy sector GHG Inventory

The energy sector GHG inventory was lead by the Ministry of Mineral Resources and Energy (MIREME) and has set a baseline for the estimation of greenhouse gas in the energy sector from 2008 to 2013 and set the projections from 2014 up 2035. This information will also be used for the update of the second national communication and is seen as a strategic instrument to continue doing as the demand for data and reporting continues. The MIREME GHG inventory have a particular importance for making projections and scenarios up to 2035, which will be the basis com comparison and for MRV and for policy control including for the evaluation of the country's NDC and other policies in terms of their effectiveness.

8.5. NAMA for Waste Sector.

The elaboration of the Nationally Appropriate Mitigation Actions (NAMA) have been a great challenge for the country because of lack of internal capacity to develop a strong NAMA. It was on in support of the Government of Mozambique that in 2014, the Belgium Federal Government and Carbon Africa and MITADER partnered for the elaboration of the NAMA for waste sector. The concept for this NAMA has been approved by the NAMA Facility and the country in in process of developing a full proposal. With this NAMA for waste sector, the reporting structure will be improved with higher quality information. On the other hand, the NAMA will provide information that can be utilized in other processes or other processes may provide information to the NAMA depending on which instrument is finalized first. The Waste NAMA is being coordinated by the National Directorate of Environment (DINAB) of MITADER.

8.6. NAMA for Agriculture.

The NAMA for agriculture builds on the actions proposed in the NDC and supported the mechanism of transparency through estimation of the GHG emissions in the sector. The Agriculture NAMA focus on rice production strategies and enteric fermentation management. The Ministry of Agriculture (MASA) is leading this process with support from the Food and Agriculture Organization of the United Nations (FAO). This also includes identification of the emission reduction options which will be reported in the National Communications or in the Biennial Update Reports. A well developed NAMA for the Agriculture sector is an asset that can be utilized by many sectors. The concept paper has been submitted for review to NAMA Facility and the country.

8.7. NAMA for Vegetable Charcoal

The NAMA for Vegetable Charcoal production builds on options to reduce GHG emissions generated through the process of production and utilization of GHG emission in the forest sector. This NAMA is being coordinated at MITADER with technical support from the UNEP DTU Partnership and is a



contribution for the estimation of emission factors for the vegetable coal and an opportunity to collect, store and process data about vegetable coal production and utilization. This NAMA is a test of the ICAT sustainable Development guidance, which aims at promoting a sustainable value chain of the vegetable coal in Mozambique.

8.8. Capacity Building Initiative for Transparency (CBIT)

The Capacity Building Initiative for Transparency (CBIT) is an important initiative to support the development of capacity to report as specified in the enhanced transparency framework of the Paris Agreement. The CBIT process is under the coordination of MITADER. The CBIT process is currently ongoing in terms of its elaboration with support from UN Environment. This process will build on the gaps identified through the ICAT project. It is very important for the sectors to clearly support the ICAT because the results of the ICAT will be the basis for CBIT planning, therefore, will contribute for an effective NDC reporting.

8.9. Climate Public Expenditure and Institutional Review (CPEIR)

The other MRV system for climate finance is Climate Public Expenditure and Institutional Review (CPEIR). The Climate Public Expenditure and Institutional Review (CPEIR) is a review to the expenditure on activities that are related to climate change in order to assess the extent to which this expenditure is guided by existing policy and institutional responsibilities. Based on this review, the CPEIR aims to generate recommendations for improving the climate relevance of public expenditure in the future, through improvements to policies, institutions and the management of public finances. The implementation and elaboration of the CPEIR was coordinated at the National Council for Sustainable Development (CONDES) and then by MITADER. Currently, there is a project with the World Bank group to continue using the State Financial Administration System (SISTAFE) data from 2015 to 2017 to run the CPEIR analysis.

At the heart of the CPEIR is the classification of public expenditure into different categories that are relevant to climate change, both centralized expenditures and decentralized expenditures. The figure 9 below shows that the amount of investment for the climate change has increased from 6.2 billion Meticaïs in 2009 to around 22 billion meticaïs in 2014. This represents a growth both in terms of numeric growth and in terms of the percentage of climate change investment out of the total Growth Domestic Product (GDP). The expenditures went up, from 6.8% of government expenditures in 2009 to 9.7% in 2014, and from 2.1% to 4.3% of GDP in 2009 and 2014. Climate change expenditure have grown faster than GDP and government expenditures over the 2009-2014 period (World Bank Group, 2017).

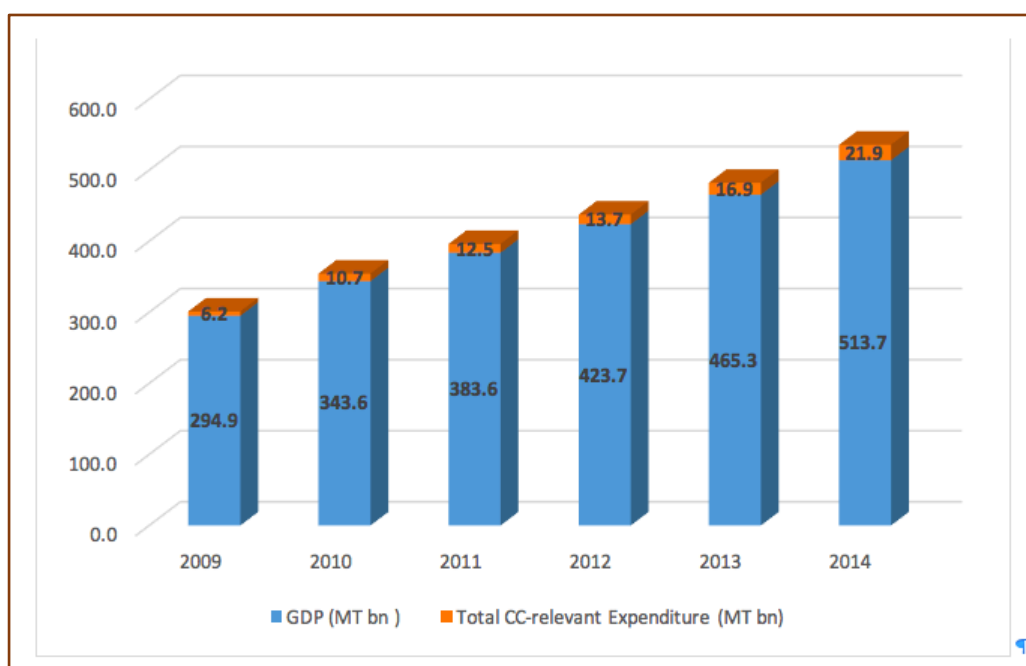


Figure 10: CPEIR from 2009 to 2014 (source: Vaislic and Zaqueu, 2017)

8.10. Public Environmental Expenditure Review (PEER)

A Public Environmental Expenditure Review (PEER) is a system that reviews the resource allocation with respect to the environment. The review assesses the efficiency and effectiveness of actual environmental resource allocation in comparison with the provisions within the environmental management framework and priorities. The conclusion of the review should suggest reforms to current practice in order to improve performance of the implementation of sustainable environmental management. Given the importance of the outcome of the PEER in policy making, it should be conducted in regular intervals and should be institutionalized as part of the overall monitoring process of the planning and budgeting formulation and execution. The first PEER was conducted in 2011 and used data from 2005 to 2010, and the second PPER is expected to be published in 2020 using data from 2011 to 2018. This ongoing exercise is aligned with NDC, BUR, SNMAMC and other reporting instruments, and is coordinated at MITADER with technical support of UNDP.

The PEER provide answers to a number of questions, including where the funds for environment are being allocated, how the decisions on the funding of the sector are currently made, how effectively and efficiently the funds are being spent and who the principal beneficiaries of the expenditure are. The data shows that climate expenditures have risen from 120 million MZN in 2005 to around 350 million in 2010. This is equal to an annual average growth rate of 26 percent. Despite this sharp rise from around 110,000.00 million MZN in 2005 to 350,000.00 Million in MZN in 2010, the total environmental expenditure remains at around 0.20% of GDP. The figure 10 below shows that external, internal and current investments in Mozambique from 2005 to 2010 (MICOA, 2011).

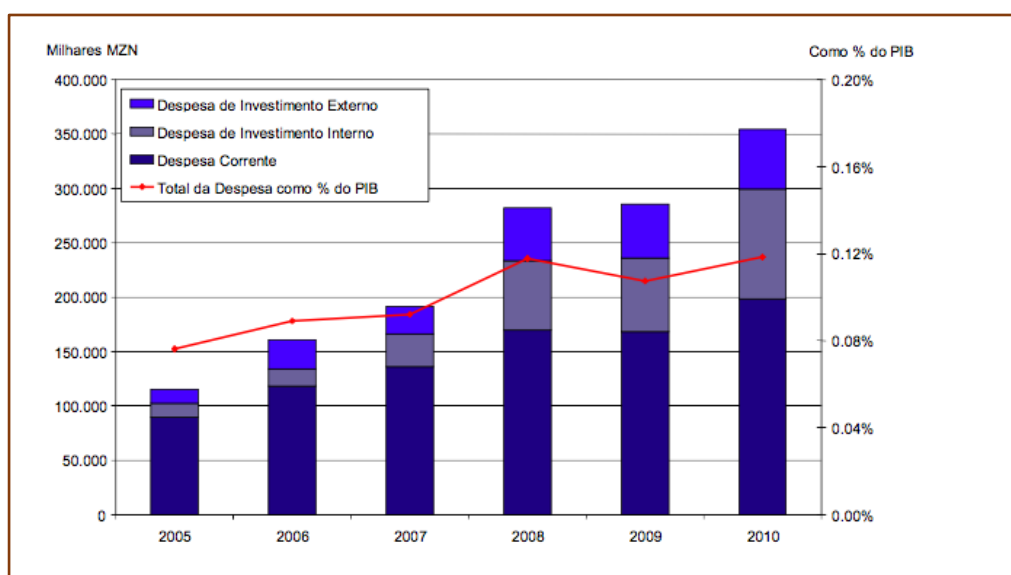


Figure 11: PEER Results in Mozambique from 2005 to 2010 (Source: PEER report published in 2011)

8.11. Summary table

The following table 16 presents the summary of the types of initiatives and their level of functionality as well as their operational status.

| Name of the Instrument | Coordinating Institution | Status |
|--|--------------------------|--|
| The National MRV system for Reducing of Emission from Deforestation and Degradation (MRV-REDD+) | FNDS/DINAF-MITADER | The National MRV system for REDD+ has prepared and submitted the Forest Reference Level to UNFCCC with the proposed FREL of 46213014 tCO ₂ /year. All information available on https://fndsmoz.maps.arcgis.com |
| The Food and Agriculture Organization of the United Nations corporal Statistics Database (FAOSTAT) | FAO | The Food and Agriculture Organization of the United Nations prepares and submits the CO ₂ emissions levels from Agriculture. These are based on the information collected with government sector partners and some estimates and kept at www.faostat.org |
| The Operational Plan for the Nationally Determined Contribution | MITADER | Started in 2019 and Ongoing |
| GHG inventory of Energy | MIREME | Report Focused on 2008-2013 with Projections 2014-2035 |
| NAMA for Waste | MITADER | Started in 2014 and NAMA is under elaboration |
| NAMA for Agriculture | MASA | Started in 2019 and NAMA concept note submitted |
| NAMA for Vegetable Charcoal | MITADER | Started in 2019 and the studies are undergoing. |
| Capacity Building Initiative for Transparency (CBIT) | MITADER | Under preparation |
| Climate Public Expenditure and Institutional Review (CPEIR) | World bank | Conducted in 2017 using information from 2009 to 2014 and updating information up to 2017. Ongoing system |



| | | |
|--|------|---|
| Public Environmental Expenditure Review (PEER) | UNDP | Conducted in 2011 analysis from 2005 to 2010 and in 2019 conducting the Second PEER document. |
|--|------|---|

Table 14: Ongoing MRV initiatives in the Country

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10. Annexes

10.1. List of People Contacted

| Name | Institution | Email |
|---------------------|------------------------|--|
| Ivete Maibaze | MITADER-DPC | imaiba@yahoo.com |
| Agostinho Fernando | MITADER-DPC | agostinhofernando@yahoo.com.br |
| Tema Manjate | MITADER-DINAB | telma.manjate12@gmail.com |
| Paula Panguene | MITADER-DINAB | paulapanguene@yahoo.com.br |
| Salvo Tchamo | MITADER-DPC | sstchamo@yahoo.com |
| Guilhermina Amorane | MITADER-DINAB | gamurane@gmail.com |
| Delfim Vilissa | MASA-DPC | delfjvilissa@gmail.com |
| Sara Guibunda | MASA-DPC | sargilsemedo@yahoo.com.br |
| Eulalia Linda | MITADER-DPC | eulalia2011@gmail.com |
| Celestino Salencia | Independent Consultant | csalencia@gmail.com |
| Rosalia Pedro | MITADER- | rhosas@hotmail.com |
| Anisio Manuel Pinto | MIREME | anisiopintomanuel@gmail.com |
| Aristides Muhate | FNDS | aristides.muhate@gmail.com |
| Virgilio Fumo | MIC | virgiliofumo@yahoo.com.br |
| Joao Carlos Frade | CTA | frade@tvcabo.co.mz |
| Joao Viseu | FEMA | Joao.viseu55@gmail.com |
| Emilia Polana | MITADER-DINAB | epolana@yahoo.com.br |
| Helder Paulo | UNDP | Helder.Paulo@undp.org |
| Kemal Vaz | Verde Azul | kvaz@verdeazul.co.mz |
| Peter Pfaumann | GIZ | peter.pfaumann@giz.de |
| Nadia Adrião | MEF | mrnady@yahoo.com.br |
| Teresa Muenda | CTA | tmuenda@cta.org.mz |
| Helder Paulo | UNDP | Helder.paulo@undp.org |
| | | |



10.2. Outcome of the Stakeholder consultation meeting

The stakeholder meeting was led by MITADER, and UNEP-DTU and took place on March 14, 2019 at hotel Avenida in Maputo with 41 participants and had the following objectives:

- Component of MRV: Present the current status of the work and identify the initiatives occurred in the past about the MRV, data availability and map the synergies;
- Component of NAMA of vegetable charcoal: Present the current status of the work and validate the impact matrix to be included in the fieldwork and in the final report;
- Component of analysis of a REFIT policy: Present the current status of the work and complete the impact matrix to be included in the final report.

Results:

Component of MRV: The participants were presented the results of the initial assessment where the focus was about the MRV instruments for climate change existent (National Communications, GHG inventory, SNMAMC, BUR, BTR, NDC). The participants added initiatives that were not mentioned and corrected some dates of the MRV initiatives. In the second stage, the group work identified information that is available within their sectors and information that is not available. The second exercise was important to map the data availability and identify synergies.

Component of NAMA of Vegetable charcoal. The team presented the background about the vegetable charcoal production and vegetable charcoal technologies, presented the impact of each option and the need for sustainable usage of charcoal resources. The exercise was useful for the participants to validate the sustainable charcoal production matrix impact to be included in the questions during the fieldwork.

The component of analysis of a policy impact (REFIT), the consultant presented the policy under testing and its background and presented the characteristics of REFIT, the model for calculation of emissions and reductions and assessment if REFI will support achievement of the NDC targets and how this can support establishment of a robust MRV system. During the exercises, the participants developed the impact table and identifies indicators and relevance significance and frontier of the REFIT policy components.