



Improving the methodology for the national greenhouse gas (GHG) inventory and GHG inventory system in Madagascar

Summary

The case study highlights how an appropriate and mutually agreeable roadmap of actions and their targeted implementation can assist Madagascar in coping with the main challenges of addressing the current national United Nations Framework Convention on Climate Change (UNFCCC) reporting requirements, including knowledge gaps and capacity building needs. These needs surfaced during the process of fulfilling the current reporting requirements. However, the design of the roadmap of actions also considered future needs arising from the Enhanced Transparency Framework (ETF).

This case study describes the starting point of the roadmap of actions and explains how the approach chosen, the tools used, and sustained effort made it possible to overcome the country's challenges. This, in turn, enhanced Madagascar's "transparency" level. It also highlights the importance of developing sustainable in-house capacities for continuous future improvement.



FAO AND THE ENHANCED TRANSPARENCY FRAMEWORK

Background

As of March 2022, the Government of Madagascar had submitted its third National Communication (NC) and was planning to submit its fourth NC and first Biennial Update Report (BUR). The preparation of these documents will lay down the foundation for the update of the Nationally Determined Contribution (NDC).

During the preparation process of the national submission, several difficulties were revealed. These included the identification of: the main data sources for the previous communications; approaches for improving the methodological choice for estimating GHG emissions and removals, in particular from the agriculture, forestry and other land use (AFOLU) and the energy sectors; and accurate input information for raising the ambition of the second round of the NDC.

Main challenges

The main challenges included (i) the absence of a unique data collection and archiving system which is sustainable and efficient; (ii) the need to increase the accuracy of GHG estimates in the AFOLU and energy sectors; and (iii) the lack of emission factors specific to Madagascar's national circumstances.

These elements resulted in a lack in the "GHG inventory memory"; and increased uncertainty of the estimations

of GHG emissions and removals. They also affect the capacity to report on progress made towards the NDC implementation. Finally, they hinder the sustainability of the national system and diminish overall transparency.

Process

This case study describes the one-to-one mentoring exercise between the FAO Transparency team and national experts from the University of Antananarivo over five months (September 2020 - January 2021) during which tailor-made support was provided to address these specific challenges. Ultimately, the process led to substantial improvements in the national GHG inventory and GHG inventory system; and stronger national technical capacity in meeting the requirements of the ETF.

The main actors involved were:

- ▶ a team of national experts, mainly scientists and researchers from the University of Antananarivo hired by the National Bureau of Climate Change, Carbon and REDD+ from the Ministry for the Environment and Sustainable Development (BNCCC REDD+/MEDD), with the Capacity Building Initiative for Transparency (CBIT)'s financial support from the Global Environment Facility (GEF) as part of the "Building and

strengthening Madagascar's national capacity to implement the transparency elements of the Paris Agreement" implemented by Conservation International (CI);

- ▶ experts from the FAO Transparency team under the GEF-funded "*Global capacity-building towards enhanced transparency in the AFOLU sector*" (CBIT-AFOLU) project.

The support consisted of regular weekly meetings over five months. In the beginning, FAO experts provided the basic guidance and documentation necessary to understand and address all issues at stake (e.g. guidelines, Conference of the Parties (COP) decisions). Then, FAO and the national team agreed on the overall

process and plan of work. The technical support took place remotely, provided step-by-step guidance, and accounted for progress made and the status of advancement.

The national team, showed great dedication to the overall process and quickly completed all assignments and implemented guidance given from the FAO team of experts. They often revised the information received to ensure the implementation of the recommended approaches.

The results of these exchanges were presented and highlighted in a final report submitted to the government and administration representatives for their final revision and validation.

Advancing the methodological approach to estimate GHG emissions and removals – an in-depth look at the support provided

One of the activities funded by the national CBIT project was the development of specific emission factors for Madagascar for the national GHG inventory. The objective of the tailor-made support was to help the country increase the accuracy of their GHG inventory by increasing the current level of methodological complexity of the AFOLU and energy sectors, i.e. moving from tier 1 (basic method) to tier 2 (intermediate method) as defined by the Intergovernmental Panel on Climate Change (IPCC).

The initial scoping analysis underlined the challenges and complexities associated with improving the methodological level of all source and sink categories identified in the national GHG inventory.

In order to identify and prioritize the source and sink categories that require a methodological improvement, the national team was instructed and guided to perform a key categories analysis to the national GHG inventory in accordance with the 2006 IPCC guidelines. The results of the key category analysis provided the country with a reduced list of source and sink categories whose influence on the total GHG inventory emissions and removals is significant in terms of the absolute level, trends and uncertainty. These, in turn, require a special focus.

During the mentoring process, weaknesses in the national system were identified. These included the lack of appropriate processes for archiving and documenting the GHG inventory information; and the use of default emission factors from the Revised 1996 IPCC guidelines, which in accordance with the ETF provisions need to be substituted by the 2006 IPCC guidelines.

Outcome and success factors

The evaluation of the work by the CBIT Madagascar team (BNCCC REDD+ and CI) was positive and the national team of consultants has been assigned to the preparation of the first BUR. The work has been implemented following an agreed upon work plan and timetable, with clear roles, targets and outputs.

Success factors included:

- ▶ The consulting group was committed, dedicated and engaged, and immediately put into practice the training and guidance provided.
- ▶ The highly technical composition of the national team (scientists and researchers) allowed for a more targeted exchange of information and guidance.
- ▶ The weekly calls helped accurately assess the current state of knowledge, steps and actions taken and the progress made. Furthermore, the process was quickly revised when necessary, next steps were planned and challenges were identified and addressed during each call. This process made it possible to quickly recognize and address gaps and ultimately respond to additional needs - for example those related to documentation, archiving and reporting.

As a results of the process, the national team:

- ▶ prepared a report that included the measures and actions required for the improvement of specific emission factors for the AFOLU and energy sectors; and a list of available emission factors at a GHG inventory category level that facilitate the transition to the 2006 IPCC Guidelines and the methodological advancement to tier 2 level; and
- ▶ adopted a revised process of work, focusing on correct, transparent and detailed documentation; and archiving all information collected and utilized.



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Countries wishing to replicate this approach should ensure the following:

- ▶ **Adequate human resources are available.** One-to-one mentoring requires a dedicated group of people, with relevant expertise, assigned to complete a specific job within a well-defined and agreed upon timeframe.
- ▶ **The team has a clear understanding of the basic concepts involved and relevant expertise for the task to be performed.** The existing knowledge of basic technical aspects related to the work and task involved favored the assimilation of the process which can then be repeated in the next GHG inventory cycle.
- ▶ **Universities and research institutes are ideal partners for sustainably supporting countries in the UNFCCC processes.** They can supply technical experts and potential future trainers; and ensure the transmission of knowledge and acquired experiences.

Conclusion

Intensive one-to-one support requires the availability of dedicated human resources, and the allocation of adequate time and effort to fulfill the commitments set by the initial plan. This activity enabled Madagascar to appropriately revise the methodologies applied in their national GHG inventory, and improve its quality by increasing the accuracy of GHG estimates.

The approach adopted within the framework of this activity will allow for the continuous improvement of the specific emission factors in Madagascar and of the GHG inventory system as a whole. It will enable the country to establish sustainable 'in-house' capacity and knowledge for enhancing transparency in the future. Finally, the improved methodologies applied, and the more accurate estimates of GHG sources and sinks, can assist the country in establishing a more accurate NDC, and in tracking progress towards its implementation and achievement.

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