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World Bank

Open-Source Tools and Collaborative Platforms to Support National Greenhouse Gas Inventories in the AFOLU Sector

Road Map Pilot in Three Countries and Verification Tool

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The following activities will lead to a replication of existing MRV systems on a FLINT-based platform and the development of a verification tool based on open-source components and modules.

Background

Countries in Latin America and their international partners have confirmed the importance of technological solutions for agriculture, forestry, and other land uses (AFOLU) greenhouse gas (GHG) inventories.

The World Bank has opted to pilot collaborative, open-source solutions because they have various advantages for the countries and the Facility Management Teams. The Full Lands Integration Tool (FLINT) has been identified as a potential open-source measurement, reporting, and verification (MRV) solution. With this road map, the World Bank wants to test the software in three countries, linked to a verification tool based on the same open-source software provided by a service provider and operated by a third party.

Pilots in Three Countries

Scope of the Pilots

Each pilot will be a limited implementation of the open-source MRV tool in a county with advanced data sets for activity data and emissions factors. The pilots will focus on forest/non-forest land use, including all the land use changes from and to forest. Existing activity data and emissions factors will be used.

This road map proposes an agile approach to the development of GHG inventories and the establishment of the MRV replication on the FLINT platform. This means that short implementation cycles (for example, four months) are used to continuously upgrade a functioning MRV system. At the end of each cycle, an evaluation will identify priorities for further improvement in line with the policy demands of the country. Each pilot is limited to two agile iterations. If the pilot is successful, additional resources will be needed to continue the iterations until the country has sufficient experience and resources to run the continuous improvements without external support.

The pilot will not focus on policy questions the MRV system needs to answer. An iteration consists of standard steps (see annex A) spread over four months. In a regular MRV implementation, the emphasis would be on confirming the MRV needs; this pilot will not focus on the analysis of policy questions but rather limit itself to replicating what is already in place but on a different platform.

First Iteration

The first iteration will combine a better understanding of the science and software with the first version of the replicated system.

Two experts (one science and one governance) will meet with the local MRV team for several days and complete the following tasks:

1. Evaluation of existing MRV system (technical and institutional dimensions)
2. Introduction of the FLINT system and implementation approach

3. Listing all actions necessary to achieve the replication; identifying the tasks that can be completed in the first iteration.
4. Establishment of working groups, including staff from different departments
5. Setting targets for each working group and agree on a work plan

The next step is in-depth training to ensure that each country has sufficient expert knowledge about the FLINT and has coders available to develop modules and configurations. A training course will be organized for two government officials and four coders from each pilot country. The coders can be government officials or from a local company that already has a contract to deliver software services (or from such a company that will need to be procured in the pilot country). The condition is that these coders are available to support the pilot.

Because of World Bank rules, some expert coders cannot be contracted until the end of June 2019. Several alternatives could be considered:

1. Collaborate with the Canadian government: The Canadian government is organizing a training course that explains the FLINT-based Generic Carbon Budget Model (GCBM). The training will include a basic scientific explanation as well as module development and configuration training. The training will take place in Victoria, Canada, and be in English. Participants will need to travel and be fluent in English. The training is free (apart from a small fee for food and handouts). After the training, support could be provided for implementation of the FLINT-based system in each pilot country. This option would require immediate coordination with the Canadian counterparts.
2. Identify non-Bank funding: The expert coders who cannot be hired by the World Bank can be contracted by a third party; these experts could then provide the training and the support for the pilots. Based on past collaboration, the following parties could be contacted to explore whether they would be interested in a collaboration: SilvaCarbon has supported some of the pilot countries in the past and has expertise in MRV; involving SilvaCarbon at an early stage would be essential. GNU countries have expressed an interest in piloting open-source tools. High-level discussions would be necessary to deliver the necessary financial support on time.

Each working group might need some support for the implementation of their agreed work plan. This support would be provided by local experts who have been trained. These local experts would in turn have been coached and supported by international experts.

At the end of the first iteration, the FLINT-based replication is run in each country and the results are published. Comparing the results of the previous system with the FLINT-based system will reveal strengths and weaknesses. The results and conclusions are reported to policymakers and decision-makers.

Second Iteration

The second iteration will focus on integrating local data and local emissions factors and using national configurations. The second iteration will follow the same steps as the first iteration apart from the training:

1. Evaluation of the results from the FLINT run and development of a work plan for each working group (performed by planners/evaluators: one science and one governance person)
2. Supporting the working groups with the implementation of the work plan

3. Running the new version of the replicated system, evaluating the results, and reporting to policymakers and decision-makers

Additional Iterations

If the conclusion is to proceed with a FLINT-based system, additional iterations could start focusing on policy needs and how they could be met by the MRV system. These additional iterations are not included in the current budget.

Improving Documentation

Good documentation and training materials are essential to make the open-source tools accessible and easy to use. Developing documentation and training materials is costly and time-consuming. Throughout the implementation of this road map, two experts will work on the documentation and one translator will ensure the information is available in Spanish.

Verification Tool

The establishment of the verification tool will have three main steps: procurement of the service provider, development of modules, and setup of the verification system.

Procurement of the Service Provider

The procurement documents for the selection of a Software as a Service (SaaS) provider need to be developed and the procurement process needs to be completed. This process should be completed by June 2019.

Development of Modules

As part of the SaaS provider contract, the service provider is required to develop the modules needed by the countries. Uncertainty is a priority module that needs to be developed. In addition, country-specific modules will need to be developed with the support of the coders in each country. The accessibility of the tool will further be improved by providing intuitive user interfaces.

Setup of the Verification System

The SaaS provider will set up the verification system with modules that meet the approach used in every country and with functionality that meets the monitoring and verification requirements of the World Bank. This setup will be tested on preliminary data from each country. Once the system is functioning, training will be provided to the verifiers who will use the verification system.

Annex A. Standard Steps in One Agile Iteration

The agile approach uses short iterations to improve the existing MRV system, resulting in the next, functioning version of the MRV system. The results from the new version are compared with those from the previous version to maximize the lessons learned from the iteration. These are the standard steps of an iteration:

- **Evaluate existing MRV system:** The evaluation will include technical and institutional dimensions of an MRV system.
- **MRV needs confirmation:** Review what policy questions need to be answered as a priority and how the MRV can combine existing data to provide reliable answers to these policy questions.
- **Prioritize to-dos:** Combine MRV development plan with areas of improvement from previous cycle in a backlog of work. Prioritize the tasks in the backlog.
- **Establish working groups:** In the process of building an MRV system, different institutions will be engaged. Working groups consist of representatives from the different institutions collaborating to improve a particular aspect of the MRV system, such as, typically, activity data, integration, reporting, or modeling. Working groups on capacity building and institutional arrangements are also advisable. With every iteration/sprint, new working groups can be established or abolished according to need.
- **Set targets for each working group:** Coordinate what each working group needs to deliver and by when to combine all progress into a new version of the national MRV system by the end of the iteration/sprint. Include targets for capacity building and governance to move progressively from an assisted operation of FLINT to a self-operated system.
- **Support each working group:** The members of each working group might need to improve their skills or approach to execute their work assignments. Just-in-time and just-according-to-need technical assistance is provided in the process.
- **Run the new version of the FLINT-based MRV:** At the end of the iteration/sprint, all new data, modules, approaches, capacity, and governance are combined in a new version of the MRV system. The system is run and the results are published.
- **Identify areas of improvement:** Comparing the results of the previous and new system will reveal strengths and weaknesses. Reporting the conclusions to policymakers and decision-makers will get confirmation to continue with the existing backlog or whether adjustments in priorities are necessary. If no changes are necessary, the “MRV needs confirmation” step of the iteration does not need to be repeated.

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