



RALI Series: Promoting Solutions for Low Emission Development

Bringing Harmony to GHG MRV

The RALI Series is a collection of papers developed by the RALI project to share examples of low emission development in practice. The series features case studies, tools, and innovative new approaches in this space, highlighting user benefits and lessons learned. To learn more about the RALI project, visit <https://www.climatelinks.org/projects/rali>.

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Across the world, efforts to reduce greenhouse gas (GHG) emissions are gaining traction, catalyzed by the ambitious targets that countries have set in their nationally determined contributions (NDCs). Progress is being made through a multitude of initiatives across sectors, actors, and levels – from local projects to new national policies; from zero emission vehicles to solar panels. The wide variety of activities underway is an encouraging sign of a growing global commitment to climate action. At the same time, this breadth of activity raises yet another challenge for climate change practitioners: how do we capture these mitigation successes so that they are accurately reflected in each country’s national inventory and NDC tracking?

To address this problem, RALI has developed a first-of-its kind harmonization framework that countries can apply to bridge the gap between project level mitigation reporting and national inventories. This framework, called the RALI GHG MRV Harmonization Approach, provides a step-by-step approach to help practitioners align the mitigation results achieved on the ground, with top-down national inventories. The result is improved tracking of real progress toward NDC goals, and more transparency in how these figures are derived. Ultimately, it will also help decision makers assess the relative effectiveness of different strategies, and steer resources to those that will make the biggest dent in GHG emissions. In this paper, we provide a high level summary of the approach, describe how it is being applied in some countries, and provide resources for further information and training.

WHAT’S THE DISHARMONY ABOUT?

Why is there often a mismatch in GHG emission numbers? There are several barriers to consistent and accurate assessment of the impact of different mitigation strategies, and their combined effect. First, national emission projections may not reflect all of the mitigation actions that are underway, and therefore may overestimate future emissions. For example, if investments in advanced engine technologies are being made to change an emission factor, this change may not be captured in projections of future vehicle emissions. In addition, the variety of actors engaged in mitigation base their analysis on different data sets and assumptions, making it difficult to “speak the same language.” Because some mitigation efforts address multiple sources or sectors, there is also the potential for double counting. Different institutions have different protocols and schedules for defining, collecting, and sharing data – further complicating the problem. These and other challenges – both technical and institutional – make it difficult for analysts to be confident that they’ve produced an accurate snapshot of national GHG emissions to support NDC reporting and inform future decisions.

What are Emission Factors?

The [Intergovernmental Panel on Climate Change](#) (IPCC) defines **Emission Factors** as “the average emission rate of a given GHG for a given source, relative to units of activity.” Alongside activity data, emission factors are a key component used to estimate emissions for national GHG inventories. This means that emission factors that take into account country-specific conditions, including mitigation efforts, can reduce uncertainty for national inventories.

INTRODUCING THE RALI GHG MRV HARMONIZATION APPROACH

The MRV Harmonization Approach (Figure 1) is designed to break down these barriers and support inventory analysts in producing high quality emission inventories. Grounded in the GHG Protocol’s [Policy and Action Standard](#) and [Mitigation Goal Standard](#), the Harmonization Approach defines six steps that can be used to identify accounting discrepancies, understand why

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these discrepancies are occurring, set priorities to first address the most significant issues, and implement a plan to resolve these problems. The following summarizes the six-step harmonization process.

Figure 1: The RALI GHG MRV Harmonization Approach



Step 1: Identify GHG effects and map the causal chain

The first step of the process is to identify which mitigation action(s) to assess. The mitigation actions that are most important to assess will be different for each country. For example, several countries have identified specific actions for their NDCs that should be aligned with the UNFCCC reporting. Other countries are investing in priority NAMAs that are expected to help achieve emission reductions. Each mitigation project, policy, or program will lead to emission reductions in different ways.

In Step 1, users identify the mitigation policy or action and map the causal chain (i.e., the series of impacts the policy or action affects, which in turn yield changes in GHG emissions) of the policy's outcomes and GHG effects. This helps users clarify the intended changes in GHG emissions of the action, what rebound effects occur, and how the parameters of the activity are defined. Chapters 5, 6, and 7 of the [Policy and Action Standard](#) provide guidance on how to support this step.

Step 2: Map GHG effects to inventory sectors

Once the causal chain and impacts of any mitigation action are understood, it is important to understand how the impacts fit into a country's UNFCCC reporting. In Step 2, users map GHG impacts from the mitigation activity to the standardized sectors and source categories (using [IPCC](#) definitions) that are included in the country's national GHG emissions inventory. By defining the specific pathways for reducing GHG emissions, this step identifies the link between mitigation activities and the inventory, and tracks in which category – or multiple categories – these activities are assigned. Understanding how emission reductions are accounted for helps ensure that reductions are correctly attributed to the corresponding mitigation action, and that important achievements in reductions are captured without double-counting.

Step 3: Assess bottom-up and top-down GHG accounting

Different practitioners use different methods and draw on different data sources to estimate GHG emissions. While each of these individual approaches can be internally correct for measuring change over time, the problem comes when trying to quantify the combined impact of these disparate activities. For example, national inventory staff may assume a different emission factor than local project managers assume for a low-emission vehicle program, with the result that they produce different estimates of the reductions achieved by the same activity. In Step 3, users sort through these different assumptions to identify where inconsistencies in GHG accounting occur. They examine the current data and methods used for estimating GHGs from both a bottom-up (mitigation activity) and top-down (national inventory) approach. The top-down assessment identifies the data, methodologies, and emission factors used to understand how emissions are estimated for the inventory. The bottom-up assessment examines how each intended GHG impact of the policy or action is/will be measured and defined (e.g., the number of miles traveled or gallons of gasoline), and the methodologies for collecting and analyzing data, and addressing uncertainty. The result is a clear understanding of the methods and data being used at both levels to estimate emissions.

Step 4: Identify needs to harmonize GHG accounting

Next, users examine the findings from Step 3, and identify where the analysis methods are not aligned and/or are insufficient to capture and measure emission reductions from the mitigation activity. They look for the discrepancies in data sources

and analytic assumptions that may affect the accuracy of emission estimates. For example, the comparison could find that the frequency and timing of survey data collection used in the inventory is likely to miss energy use reductions achieved from a mitigation activity, or that national inventory emission factors don't capture changes in local or regional energy generation mix. Depending on the type of misalignment, users then identify the improvements that would be needed to harmonize the mitigation activity and inventory data, and develop concrete recommendations for changes to inventory or mitigation activity methodologies and data resolution.

Step 5: Prioritize harmonization improvements

The review in Step 4 is likely to identify a variety of areas where inventory and activity data are inconsistent, and may result in several recommendations for improvement. Not all of these actions may be immediately necessary to produce a more credible and useful assessment of progress in mitigating GHGs. In this step, users consider the relative importance of the recommendations, based on the impact a mitigation activity is likely to have on national emission levels, its expected contribution toward the country's NDC target, the status of implementation, and when changes could be implemented. Working together, users agree on the most significant harmonization efforts that will support both policy makers and activity managers in advancing their goals for emission reductions.

Step 6: Implement and harmonize

Once users decide on priorities for harmonization, the next question is how to get there. In this step, users develop an implementation plan for the priority recommendations, identify who needs to be engaged to address the data harmonization gaps, and move forward to improve the alignment of GHG measurement. While the goal is straightforward, this step requires dedicated attention and leadership. It's critical to bring together all the actors that have a role to play, sort through options, and agree on respective responsibilities for follow up. This often requires some give and take, as organizations are asked to adjust their own procedures, share information, and work with new partners in order to achieve a more robust approach to track mitigation progress.

APPLYING THE HARMONIZATION APPROACH

Now that the MRV Harmonization Framework has been developed, USAID RALI is working to raise awareness and support countries in implementing the approach. In Colombia, RALI is supporting the Ministry of Environment and Sustainable Development (MADS) and Institute for Hydrology, Meteorology, and Environmental Studies (IDEAM) to strengthen GHG MRV systems. Working with Colombian partners, RALI is applying the MRV Harmonization Framework to align the MRV of select mitigation activities with Colombia's national GHG inventory.

RALI has also presented the MRV Harmonization Framework at numerous events, including the Global NDC Conference in Bonn, Germany; the Latin American and Caribbean LEDS regional meeting in Mexico City, Mexico; and at the Conference of Parties (COP23) in Bonn, Germany. As more countries strengthen the alignment of their mitigation initiatives with their national inventories, we will improve our global capacity to track progress and move forward to meeting the global GHG challenge.



Session on the MRV Harmonization Framework at the Latin American and Caribbean LEDS regional meeting in Mexico.

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