

## RALI Series: Promoting Solutions for Low Emission Development

# Using the US EPA's Workbook to Support Preparation of National GHG Inventories: The Experience of Bangladesh

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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>.

Robust greenhouse gas (GHG) inventories are critical tools that allow countries to report their GHG emissions and track progress toward mitigating climate change. Many countries still struggle to prepare national GHG inventories, which are technically challenging and require significant time and staff capacity. For example, country governments often outsource inventory work to contractors without requiring them to transfer information on data and data sources used, which in turn requires governments to start the inventory process from “scratch” with each new submission. Limitations in inventory quality make it difficult for policy makers to base their decisions on their national inventories, or use them to track progress towards GHG emission reduction goals.

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*With US EPA's workbook on “Developing a National Greenhouse Gas Inventory System,” the Government of Bangladesh was able to tackle issues related to establishing institutional arrangements, filling data gaps, and gaining access to materials from earlier inventories—common challenges faced by many countries.*

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In this paper, the RALI team showcases how the Government of Bangladesh (GOB) used a tool developed by the U.S. Environmental Protection Agency (US EPA), with financial support from the United States Agency for International Development (USAID), to address these types of challenges, and how this tool helped produce the country's most comprehensive inventory to date. The tool is called the EPA workbook on Developing a National Greenhouse Gas Inventory System, and it is publicly available through the LEADS Global Partnership for other countries to access and gain similar benefits.

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### THE CASE OF BANGLADESH

Bangladesh submitted its Second National Communication to the UNFCCC in December 2012, which included a national GHG inventory. Afterward, it became clear to the GOB that the country's national GHG inventory could benefit from further improvement. First, the data and calculations were not sufficiently archived. Second, many of the emissions and removal estimates were based on proxy data as opposed to actual activity data, particularly for the agriculture and land use/land use change and forestry (LULUCF) sectors. Third, country-specific emission factors were not used.

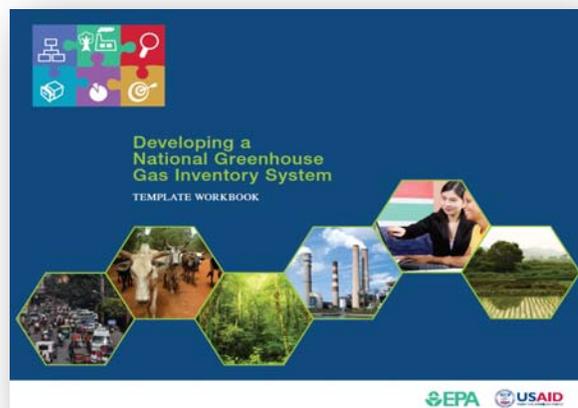
To the GOB, these and other issues warranted a solution because Bangladesh was working on its Intended Nationally Determined Contribution (INDC) to the UNFCCC and was interested in accessing climate finance. To achieve this, an improved national inventory was needed to demonstrate Bangladesh's commitment to properly accounting for its emissions. Moreover, the GOB determined that by formalizing its inventory preparation arrangements and procedures, its inventories could become more robust in terms of data quality, and preparing them could be done more efficiently. The US EPA's national GHG inventory workbook would provide a structure to help the GOB achieve this goal.

## About the EPA workbook

The workbook consists of a series of worksheets that walk users through six key topics that comprise a robust inventory system:

- 1) institutional arrangements;
- 2) recordkeeping of GHG estimation methods and data selected;
- 3) quality assurance/quality control (QA/QC);
- 4) archiving of inventory inputs and outputs for efficient future reference;
- 5) key category analysis; and
- 6) national inventory improvement planning.

The workbook gives inventory preparers a structure they may follow to create the inventory from start to finish. This is useful to new inventory teams with limited experience, as well as experienced teams that may wish to improve the inventory while preparing it more efficiently. It also gives inventory teams a place to document the steps they took to prepare the inventory (including data and data sources used), so when future teams begin to work on a new inventory, they need not start from the first step.



## How Bangladesh engaged with the workbook

The lead agency that engaged with the workbook was the Department of Environment (DoE), namely its inventory sector leads and project management officials responsible for preparing the national GHG inventory. They saw that learning how to use the workbook would permit them to use it as a framework for the inventory included in its Third National Communication (TNC), and hence engaged in building capacities focused on the US EPA workbook. Personnel from other national agencies also engaged in the process—including the Forest Department, the Department of Agricultural Extension, the Power Development Board, and the Bangladesh Bureau of Statistics—as well as consultants who were involved in preparing the inventory chapter of Bangladesh’s TNC.

During multiple intensive focus group discussions that took place over two years, these participants learned the key concepts elaborated within the workbook, and thus acquired knowledge and skills that would help them prepare the inventory for Bangladesh’s TNC and subsequent reports. The DoE itself made meaningful progress in developing appropriate internal and organizational capacities, two key attributes of a sustainable inventory preparation process.

The DoE team achieved several concrete goals. The team systematically developed an inventory work plan; identified major barriers like data gaps and how they intended to address them; and created a quality assurance and quality control plan. The team also drafted its consultants’ terms of reference in a way that would facilitate archiving and future data collection efforts. Specifically, the terms of reference required consultants to submit all materials and data they collected to project management for future reference.

These achievements pave the way for the DoE to make further progress in inventory preparation, and replicate the preparation process for each new inventory in spite of staff turnover or reliance on consultants.

## Outcomes

By using the workbook, the GOB and its consultants accomplished a number of inventory milestones. First, they created an organizational chart and a statement of work that officially assigned personnel to the inventories' various sectors; arranged for these assigned sector leads to allocate an appropriate amount of their time to the GHG inventory; and stated the skills that these personnel were required to have. Second, they outlined the tasks and responsibilities of the project management unit, including development of emission and removal estimates for the major inventory categories, and determination of when to use Tier 2 or Tier 3 methodologies as opposed to Tier 1 to improve the accuracy of the inventory.<sup>1</sup> Instrumental in this were the Methods and Data Documentation (MDD) Template; a reporting template based on those in the 2006 IPCC Guidelines (to facilitate reporting to the UNFCCC); a Quality Assurance and Quality Control Plan; an Archiving Plan; and an Inventory Improvement Plan.

The US EPA inventory workbook offered project personnel clear and readily adoptable inventory processes. The workbook's templates on Institutional Arrangements, Methods and Data Documentation, Quality Assurance and Quality Control, and Archiving helped inventory managers see the life cycle of the inventory. This made planning easier and internal deadlines clearer. In addition, its template for Methods and Data Documentation gave inventory staff the background they needed to employ the Memorandum of Understanding template (for data sharing)—available in a companion US EPA resource, the “Inventory Toolkit”—to obtain emissions-related data from data providers.

Beyond these direct outputs, the comprehensive, clear, straightforward, and process-oriented nature of the tool enhanced sector leads' overall inventory capacities, especially their grasp of the organizational issues they would need to address to improve upon the inventory in Bangladesh's Second National Communication.

**Before using the US EPA inventory template workbook, consider the following tips:**

- The workbook is adaptable to user circumstances—it may be completed in whole or in part, as each chapter is designed to stand alone.
- The workbook may be completed electronically (using Microsoft Word) or in hard copy by printing the chapters of interest.
- Completing the workbook takes time (at least several weeks or months) and requires collaboration among key inventory decision makers and sector leads.
- The greater the effort invested in the workbook, the greater the benefit to its users.

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<sup>1</sup> The 2006 IPCC Guidelines for National Greenhouse Gas Inventories describes several techniques to estimate greenhouse gas emissions or removals. It refers to these techniques as “tiers,” and defines them in general terms as follows: “A tier represents a level of methodological complexity. Usually three tiers are provided. Tier 1 is the basic method, Tier 2 intermediate and Tier 3 most demanding in terms of complexity and data requirements” (source: Volume I, Chapter 1).

## Lessons Learned

To effectively employ the workbook, its users may consider two key lessons from the GOB's experience.

First, resources and staff time must be managed in a manner that allows participants to engage fully with the workbook. This is because effective use of the workbook requires that specific inventory preparation actions and roles be assigned to specific people, and they need time and resources to carry out these assignments. In the case of Bangladesh, lack of dedicated staff time was a significant hurdle. Addressing this staffing capacity issue allowed staff to make progress on the workbook and implement the roles and procedures outlined therein. The GOB confronted these challenges after observing how other countries, like the United States, followed a long-term system of inventory preparation that supported their internal and external commitments. This demonstrated to the GOB the value and significance of the inventory, justifying greater investment in its preparation.

Second, aligning the internal processes of the core inventory team with demands of inventory preparation may help the team efficiently fill in the EPA workbook. In Bangladesh, DoE addressed limitations and gaps in its inventory preparation processes and introduced a systematic approach to preparing the inventory. When a department's processes are modified and augmented to suit inventory preparation—as they were in Bangladesh—it becomes easier to record them in the EPA workbook. This internal alignment increases the likelihood of personnel completing their assigned tasks and producing a robust inventory, and improving the inventory with each new version.

## Accessing the Workbook

The US EPA inventory template workbook is available online free from the following website: [U.S. EPA's Developing a National Greenhouse Gas Inventory System](#).

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