U.S. EPA’s GHG Inventory Capacity Building Activities and Lessons Learned

William N. Irving
Climate Change Division
Office of Atmospheric Programs
US Environmental Protection Agency

November 12, 2013
Overview

• Why compile a national GHG inventory?
• US EPA’s GHG inventory capacity building regions and approach
• Tools and how the US EPA can help
• Lessons Learned
• Additional Resources and Links
Why compile a National GHG Inventory?

Build a Solid Foundation for Low Emission Growth

“Can’t manage what you don’t measure”

- Understand national GHG emissions, removals and trends
- Identify cost-effective policies and programs to reduce emissions, but enhance climate resiliency
- Meet international obligations and participate in future GHG programs and agreements (UNFCCC reporting)
- Enhance environmental integrity of mitigation options (baselines, BAU emissions/projections, NAMAS, REDD+, and LEDS, etc.)
- Useful indicators for environmental assessment and management, economic development and planning
Capacity Building Efforts to Date

**Central America**: First regional project. Developed our current approach and designed our tools.
- Phase I: 2004-2007
- Phase II: 2007-2010

**South East Asia**: Currently 6 country project. *Strong partnership with UNFCCC.*

**Andean Region**: Scoping trips to Colombia, Peru and Ecuador. Initiating work with Colombia. Applying the lessons learned and tools developed for other regions.
- Phase I: 2012-2015.

**Eastern and Southern Africa**: Currently 8 country project.
- Apply the lessons and tools developed in other regions. *Strong partnerships with UNFCCC, CD-REDD.* Phase I: 2011-2014.

EPA leads technical implementation. USAID is key partner in all regions, providing funding and overall planning and implementation support.
NA-1 countries have made progress, technical capacity exists, but some challenges remain:

- Small teams with limited resources and multiple roles
- Insufficient records from previous inventories
- Need for stronger institutional arrangements
- Incomplete or non-existent activity data
- Lack of country-specific emission factors
- Difficulty retaining expertise
EPA Approach

A Simple Approach to GHG Inventory Capacity Building

• **Goals**
  – Assist countries to develop a high quality GHG inventories (transparent, accurate, consistent, complete and comparable), with focus on key sectors, such as Agriculture and Forestry (LULUCF)
  – Build solid foundation for more regular reporting and steadily improving inventory quality

• **General approach**
  – Improve institutional capacity of a country to establish a sustainable National GHG Inventory System
  – Provide technical assistance to apply and improve methods, activity data collection and documentation
  – Cannot “train” experts on methods alone—they must learn by doing
Steps for GHG Inventory Capacity Building

Scoping/select Project GHG Inventory Team
Understand country/regional objectives, assess institutional arrangements, select project coordination team.

Initial Planning session
Country(s) present current inventories; review inventory system and estimation methodologies; and identify activity data (AD) gaps.

Working sessions
Assist with cross-cutting inventory management tasks, assembling AD; produce inventory and document the process/results.

Wrap-up Session
Country(s) present improved inventories and discuss next steps.
EPA and Country Inventory Team Partnership

EPA Implementation Approach

- Establish Institutional Arrangements, define inventory scope and improvements
- Define data documentation, QA/QC, and archiving procedures
- Data collection, generate Estimates and Draft Report
- Review QA/QC, Key Category Analysis
- Finalize Report
- Moving forward: Inventory Improvement Plan

EPA approach designed to support countries along inventory preparation process
Capacity Building Tools

**National System Templates**
Helps to document, institutionalize and streamline the inventory management process

**ALU Tool**
Helps to compile AD, perform calculations, implement QA/QC procedures and produce reports
Developing accurate and consistent land use maps has been a major focus of recent EPA assistance, in particular the ESA project.

- Lack of good quality maps and land use/conversion data is a key obstacle for many countries in preparing a complete and consistent representation of their land base as required by the IPCC Guidelines.

Additional Tools

1) Institutional Arrangements Toolkit *(Under Development, available end of year)*

- Example MoU for data providers
- Sample TORs for sectoral experts/reviewers
- Budget templates
- Timeline templates

2) Key Category Analysis (KCA) Tool: Enables a country to determine the most important emissions categories and identify areas for improving estimates and moving to higher Tier IPCC methods (consistent with 2006 GL)

3) Providing technical assistance on methods, activity data collection, and documentation.

- **Activity Data Assessment Questionnaires**
  Helps assess a country’s activity data availability, gaps and needs, (Energy, Agriculture/LULUCF, Waste, etc.)

- **Agriculture, Land-Use (ALU) Data Workbooks**
  ALU data workbooks facilitate data collection and organization for entry into calculation tools.
Lessons Learned

• *Developing a high quality inventory is not* easy—but we all know there are many reasons to do it!
• A dedicated Regional/National Project Coordinator to oversee day-to-day activities is essential
• GEF funding is necessary to complement EPA technical assistance
  – Enables countries to engage experts to supplement limited human resources
• Initial emphasis on *institutional arrangements is necessary* to support data needs to calculate emissions now and in future for UNFCCC reporting (NC and BUR)
  – EPA’s Developing a National Inventory Systems Template Workbook is useful and provides a foundation for planning and designing a national GHG inventory system, in particular institutional arrangements
    ➢ Facilitates effective organization and management of GHG inventory; but dedicated effort is required
    ➢ Promotes transparency, accuracy, consistency, completeness, and comparability (IPCC Good Practice)
    ➢ Does not solve all problems, but helps create “institutional memory” or continuity
    ➢ Reduces future costs/effort
    ➢ Applicable at national or sub-national level
    ➢ *Mentoring support* is required to apply/translate templates from “paper system” to functional components of national inventory system to support UNFCCC reporting
• Inventory teams **learn by doing**, not by just training
  – Hands-on one-on-one work using the country data is necessary to truly enhance technical capacity

• Emphasis should also be on **activity data**
  – Must work with the country to help them overcome barriers with data collection (e.g. facilitating discussions with data providers, designing expert knowledge surveys, etc.)

• Each country is unique—**flexibility** is important
  – Regional meetings facilitate exchange of expertise, inventory management strategies
  – Bilateral assistance is important to engage all relevant experts to effectively support the country-specific inventory process (e.g. institutional arrangements, data gaps, etc.)

• A **sustained, long-term effort** is necessary for success

• **Dedication** from the National Inventory team is crucial!
• Download fact sheets on benefits of national GHG inventories, EPA capacity building activities, and preparing land use land cover maps from the EPA Website www.epa.gov/climatechange/capacitybuilding
Helpful Resources & Links we share with partners

- **Receive technical assistance on GHG inventories** from the EPA: [http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html](http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html)
- **Download the Agriculture and Land Use (ALU) National GHG Inventory software**: [http://www.nrel.colostate.edu/projects/ALUsoftware/](http://www.nrel.colostate.edu/projects/ALUsoftware/)
  - Contains recent updates and demonstration videos!
- **Apply for financial support** from the Global Environment Facility for:
  - National Communications: [http://www.thegef.org/gef/CC_direct_access](http://www.thegef.org/gef/CC_direct_access)
- **Participate in training** from the UNFCCC Consultative Group of Experts: [http://unfccc.int/national_reports/non-annex_i_natcom/cge/items/2608.php](http://unfccc.int/national_reports/non-annex_i_natcom/cge/items/2608.php)
EPA is also coordinating with other USG Initiatives with a component on GHG inventories

- **LEAD – Low Emission Asian Development**
  - Focus on LEDS implementation and development, including GHG Inventories
    - 12 Countries: Bangladesh, Cambodia, India, Indonesia, Laos, Malaysia, Nepal, Papua New Guinea, Philippines, Thailand, Vietnam
    - [http://www.lowemissionsasia.org](http://www.lowemissionsasia.org)

- **SilvaCarbon**
  - Focus on improve monitoring of forest and terrestrial carbon
    - Partner Countries: Colombia, Peru, Ecuador, Gabon, Vietnam,
    - Regional: Congo Basin, SE Asia
    - [http://www.silvacarbon.org/](http://www.silvacarbon.org/)

- **EC-LEDS (Enhancing Capacity for Low Emission Development Strategies)**
  - Focus on LEDS implementation and development, including GHG Inventories
    - Over 20 countries including Albania, Bangladesh, Colombia, Costa Rica, Gabon, Indonesia, Kenya, Macedonia, Mexico, Moldova, the Philippines, Serbia, and Vietnam
Thank you for your attention!

irving.bill@epa.gov
+202.343.9065

U.S. EPA Inventory Preparation Tools
http://www.epa.gov/climatechange/EPAactivities/internationalpartnerships/capacity-building.html
Extra Slides
We have taken key elements of the IPCC and UNFCCC guidance and condensed them into an easy-to-use National Template Workbook.
Based on inventory systems developed in concert with other countries

Each template becomes a chapter of the National Inventory

Each template provides documentation of critical building blocks
Agriculture and Land Use (ALU) Software

- Estimates emissions and removals for Agriculture and LULUCF through a user-friendly interface
- Based on IPCC methods (1996 GL, GPG & 2006 GL)
- IPCC Tier 1 and 2 approaches
- Produces emission reports and archives inputs and calculations

Geographic Information Systems

Emission Factors

Management Activity Data

ALU Inventory Software

Generates detailed reports
Module I: Specify Activity Data
- Primary Data Specification
  - Land Use and Management
  - Livestock
  - N Fertilizer
  - Liming
  - Sewage Sludge Amendments
- Secondary Data Specification
  - Crop Residue Management
  - Livestock Management
  - Rice Management
  - Savanna/Grassland Burning
  - Biomass Carbon Loss

Module II: Specify Emission/Stock Change Factors
- Enteric Methane
- Manure Methane
- Manure Nitrous Oxide
- Biomass Burning Non-CO2 GHG
- Soil Nitrous Oxide
- Rice Methane
- Biomass C Stocks
- Soil C Stocks

Module III: Inventory Calculations QA/QC
- Enteric Methane
- Manure Methane
- Manure Nitrous Oxide
- Biomass Burning Non-CO2 GHG
- Soil Nitrous Oxide
- Rice Methane
- Biomass C Stocks
- Soil C Stocks