Information Matters, Philippines:
Capacity Building for Enhanced Reporting and Facilitation of International Mutual Learning through Peer-to-Peer Exchange

Orientation-Workshop on IPCC 2006 Guidelines & Software for Greenhouse Gas Inventories for AFOLU

Microtel Hotel, Quezon City, 24-25 August 2017

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

On behalf of

Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

of the Federal Republic of Germany

Project:

Information Matters
Transparency through Reporting

Information Matters: Capacity Building for Enhanced Reporting and Facilitation of International Mutual Learning through Peer-to-Peer Exchange
https://www.transparency-partnership.net/information-matters-capacity-building-ambitious-reporting-and-facilitation-international-mutual-lear

Registered offices

Bonn and Eschborn, Germany
T +49 228 44 60-0 (Bonn)
T +49 61 96 79-0 (Eschborn)

Friedrich-Ebert-Allee 40
53113 Bonn, Germany
T +49 228 44 60-0
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn, Germany
T +49 61 96 79-0
F +49 61 96 79-11 15

E info@giz.de
I www.giz.de

Authors and Responsible:
Anna Manahan

Photo credits
GIZ

Manila August 2017

Contents

List of Tables

List of Figures

Acronyms

AFOLU	Agriculture, Forestry, and other Land Uses
ALU Software	Agriculture and Land Use National Greenhouse Gas Inventory Software
BMB	Biodiversity Management Bureau
BMUB	German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety
BUR	Biennial Update Report
CCC	Climate Change Commission
DA	Department of Agriculture
DOM	Dead Organic Matter
FMB	Forestry Management Bureau
GHG	Greenhouse Gases
GHGI	Greenhouse Gas Inventory
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
HLURB	Housing and Land Use Regulatory Board
IKI	International Climate Initiative
IM	Information Matters
IPCC	Intergovernmental Panel on Climate Change
NC	National Communication
PSA	Philippine Statistical Authority
SOM	Soil Organic Matter
UNFCCC	United Nations Framework Convention for Climate Change
UPLB-CFNR	University of the Philippines-Los Baños – College of Forestry and Natural Resources

Executive Summary

The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) on behalf of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) has initiated the "Information Matters (IM): Capacity Building for Enhanced Reporting and Facilitation of International Mutual Learning through Peer-to-Peer Exchange" project. IM phase I was completed in 2015 which aimed at strengthening in-country capacities for enhanced reporting under the United Nations Framework Convention on Climate Change (UNFCCC) in four pilot countries (Chile, Dominican Republic, Ghana, Philippines). A special focus laid on the preparation of Biennial Update Reports (BURs) and the development and implementation of sustainable systems for measurement, reporting and verification (MRV). Now in its second phase, additional backstopping support is provided to countries of the first phase of the project. In the case of the Philippines, this support aims to further strengthen climate information management and enhance reporting capacity to UNFCCC. The current project phase also added the four countries Columbia, Egypt, Georgia and Vietnam as well as an Ad-hoc Facility.

In line with this backstopping support, an orientation-workshop on the 2006 Intergovernmental Panel on Climate Change (IPCC) Guidelines and Software for the Agriculture, Forestry, and other Land Uses (AFOLU) sector was conducted on 24-25 August 2017. The orientation-workshop aimed to enhance the capacities of government agencies involved in preparing and reporting greenhouse gas inventory (GHGI) inventories for the AFOLU sector, specifically through the use of the 2006 IPCC Software and building on the participants' familiarity with the Agriculture and Land Use National Greenhouse Gas Inventory (ALU) Software. Dr. Florencia Pulhin, an expert on the 2006 IPCC Guidelines and Software, shared her knowledge and expertise on using the software. She further provided hands-on exercises so the participants would be able to assess which software is more appropriate for their respective sectors.

The participants shared both positive and negative feedback on the applicability of the 2006 IPCC software. For instance, the software is easy to use and reports can be generated comfortably. However, it would be difficult to use for sectors like biodiversity or settlements given that definitions of the categories in the Philippine context differ from the IPCC definition.

During the discussion, the need to address the lack of available data and data sharing was pointed out. Hence, research and proper coordination among agencies are necessary in order to improve the GHGI in the country.

BMUB International Climate Initiative (IKI)

Since 2008, the International Climate Initiative (IKI) of the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) has been financing climate and biodiversity projects in developing and newly industrializing countries, as well as in countries in transition. Based on a decision taken by the German parliament (Bundestag), a sum of at least 120 million Euros is available for use by the initiative annually. For the first few years, the IKI was financed through the auctioning of emission allowances, but it is now funded from BMUB budget. The Initiative places clear emphasis on climate change mitigation, adaptation to the impacts of climate change and the protection of biological diversity. These efforts provide various co-benefits, particularly the improvement of living conditions in partner countries.

The IKI focuses on four areas: mitigating greenhouse gas (GHG) emissions, adapting to the impacts of climate change, conserving natural carbon sink with a focus on reducing emissions from deforestation and forest degradation (REDD+), as well as conserving biological diversity.

New projects are primarily selected through a two-stage procedure that takes place once a year. Priority is given to activities that support the creation of international climate protection architecture, transparency, and innovative and transferable solutions that have impacts beyond the individual project. The IKI cooperates closely with partner countries and supports consensus building for a comprehensive international climate agreement and the implementation of the Convention on Biological Diversity.

BMUB IKI Homepage
www.international-climate-initiative.com

Methodology and Approach

The trainer used a combination of input presentations to provide an overview and for setting up the Intergovernmental Panel on Climate Change (IPCC) 2006 software and hands-on exercises for actual use of the software. The entire training lasted for two days and at the end of the orientation-workshop, a post-training evaluation and a post-training quiz were administered to test the training's efficiency, effectiveness, and relevance to participating agencies as well as the level of the attainment of workshop objectives and to gauge how participants appreciated the shared knowledge and expertise, respectively.

Participants and Resource Persons

Representatives from national government agencies in charge of greenhouse gas inventory (GHGI) for Agriculture, Forestry, and Other Land Use (AFOLU) sectors, namely Department of Agriculture (DA), Philippine Statistical Authority (PSA), Department of Environment and Natural Resources, (Biodiversity Management Bureau (BMB), Environmental Management Bureau, Forest Management Bureau (FMB), and Housing and Land Use Regulatory Board (HLURB) participated in the training. It was also joined in by officials and staff from the Climate Change Commission (CCC) and GIZ. Technical expertise was provided by Dr. Florencia Pulhin of the Forestry Development Center, University of

the Philippines-Los Baños – College of Forestry and Natural Resources (UPLB-CFNR)

Preliminaries

A quick introduction of participants was followed by welcome remarks from **Ms. Sandee Recabar, Division Chief of Implementation Oversight Division, Climate Change Office - Climate Change Commission (CCO-CCC).** On behalf of the CCC, *Ms. Recabar* welcomed the participants and thanked the German Government for providing support to this activity through the Information Matters (IM) project. She emphasized that one of the mandates of the Commission is to formulate strategies for mitigation. Thus, since 2012, the Commission has been mainstreaming the compilation of GHGI in key government agencies. In 2014, Executive Order (EO) 174 was signed to institutionalize GHGI and management in key agencies and identified lead agencies for GHGI of agriculture, waste, industry, transport, forestry, and energy (AWIT-FE) sectors. Specifically, for the AFOLU sector, PSA and DA take the lead for GHGI of agriculture sector, and FMB-DENR for forestry sector and other land use.

In early 2017, a meeting with sectoral lead agencies took place to ensure that the final GHGI for 2010 for each sector will be released this year. Hence, the training on 2006 IPCC software was suggested by the agencies in charge of AFOLU given that not all land uses/land use types can be calculated by the Agriculture and Land Use National Greenhouse Gas Inventory Software (ALU). Thus, this training on 2006 IPCC software provides another option for agencies for calculating GHGI for AFOLU.

To that end, Ms. Recabar hoped that the lead agencies for the AFOLU sector would be able to assess the benefits of using both types of software and to be guided them accordingly. If the agencies have already decided which software they will use, she requested the agencies to inform the Commission so adjustments can be undertaken accordingly, especially because CCC is mandated to consolidate GHGIs from all sectors.

Knowledge on the 2006 IPCC Software and Expectations Check

The participants were asked to rate their knowledge and experience on using the 2006 IPCC Inventory Software for AFOLU from zero (0, lowest) to ten (10, highest). Each participant then posted his/her name on a round piece of paper to generate the probability distribution function of their level of knowledge on the topic, *see below graph*. Note that majority of the participants rated themselves to have low knowledge/experience on the IPCC 2006 software.

The same exercise was undertaken prior to formally concluding the two-day session to determine the change or improvement in the level of knowledge of participants. The figure below (*pink for pre-training and green for post-training)* documents the perceived improvement on the level of knowledge of participants related to the

topic. The mean level of knowledge has increased from 0.5 to 5.25 while mode has improved from 0 to 6. In addition, participants were asked to share their questions and expectations they would like to see addressed during the training.

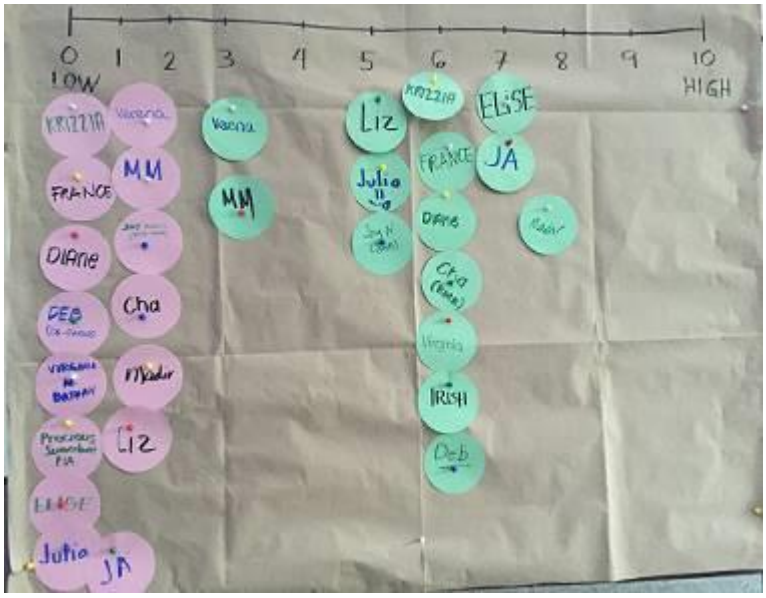


Figure 1. Comparison of Pre and Post Training Rate of Knowledge on 2006 IPCC Software

Table 1. Expectations from Participants

Expectations	• Relevant use of the 2006 IPCC Software to different agencies • How the software would be relevant for BMB, specifically for Protected Areas • How wetlands is defined and GHG emissions is measured using the 2006 IPCC software, specifically for underground carbon of peatlands and mangroves. • Learn to use and apply the 2006 IPCC software to work and studies • Actual application of the software to our work • Practical usage of the software and relevance of output in the ground level • By the end of the training, I should be able to confidently navigate through the software to aid in planning and decision-making • Be able to guide in the GHG inventory and sectoral inventory template • The tool to be introduced can aid in deciding what software to use in GHG calculation • Difference between ALU and 2006 IPCC software • Data needed for the software • How can we address data gaps using the software?

Information Matters Project: A Global Overview

Ms. Verena Schauss, Junior Advisor, GIZ, Information Matters Global

Ms. Schauss presented an overview of the IM project and provided updates on project activities. Under the support of BMUB, the IM project provides capacity-building and technical support to a number of selected partner countries to strengthen their in-country capacities for enhanced reporting under the United Nations Framework Convention on Climate Change (UNFCCC). A special focus lies on the preparation of Biennial Update Reports (BURs) and implementation of sustainable systems for measurement, reporting and verification (MRV). The project adopted a specific country-tailored approach, where the conceptualization underwent consultations with the partner countries to identify and prioritize specific needs for the setup of MRV systems and the preparation of national GHGI. These needs were subsequently addressed through tailored in-country capacity-building workshops and trainings.

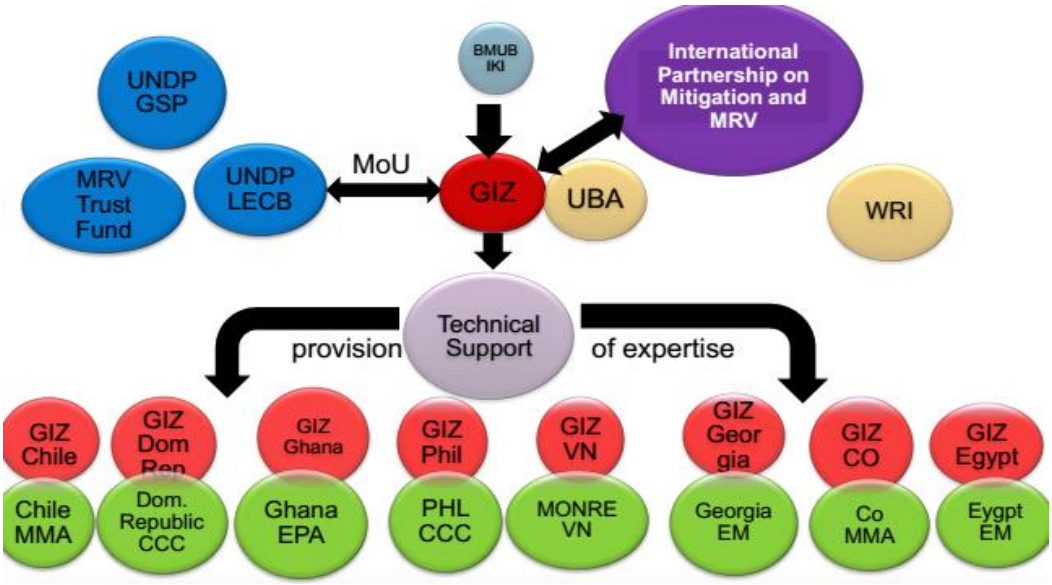


Figure 2. Project Framework

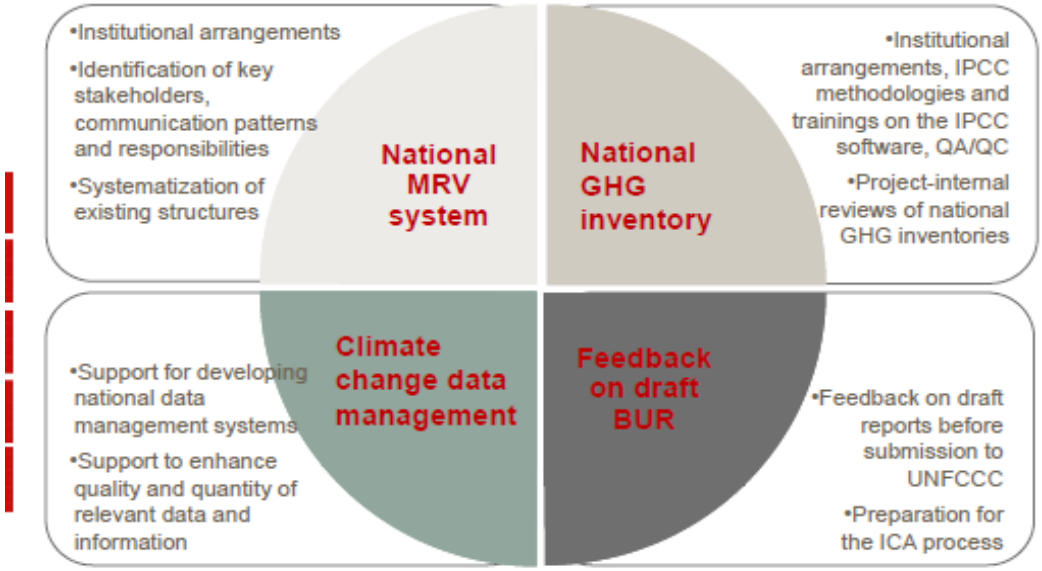


Figure 3. Areas of support under IM project

The phase I of the project was conducted in four pilot countries (Chile, Dominican Republic, Ghana, Philippines), while the second phase included four (4) additional countries: Colombia, Egypt, Georgia and Viet Nam as well as an Ad-hoc facility to support further non-Annex I countries. Project activities include the following:

a. Identification of specific needs and priorities of the MRV systems and GHG monitoring in the partner countries;

b. Provision of tailor-made capacity-building trainings and backstopping as well as concepts for institutionalisation; and

c. Sharing of knowledge through peer-to-peer exchange and generation of knowledge products.

Moreover, numerous knowledge products that incorporate experiences and lessons learned were developed and published under the project. Published knowledge products include a) an updated version of the Stock Taking tool, b) an updated version of the BUR template, c) a Practice Study on GHGI in the Waste Sector, d) a BUR Process Guidance Tool, and e) a guide for Preparing for the ICA Process: required efforts and capacities needed.

Table 2. Knowledge Products under IM project

Knowledge Product	Objective	Method	Output
Stock Taking Tool 2.0	Assess the countries' current situation including strengths and gaps on MRV and overall mitigation landscape	Analytical tool that assists countries in identifying and prioritizing actions to develop national MRV systems	List of prioritized actions
BUR template 2.0	Assist countries in the preparation of transparent and ambitious BURs based on their national circumstances	Template providing a proposed structure/layout and guiding questions for information to be presented following (1) minimum requirements and (2) good practice/enhanced reporting	BUR in line with the UNFCCC requirements: Updated template reviewed with inputs from UNFCCC, UNDP, UNEP, WRI and experience/feedback from countries The template does not constitute an official UNFCCC document
BUR Process Guidance Tool	Assist countries in the overall process of preparing their BURs, undergoing the ICA process while enhancing their MRV systems	Interactive six step process defining main actions, identifying steps to be taken and allowing a rough time estimation for the overall process, depending on the countries´ circumstances	List of necessary steps to be taken including an estimation of the time required to implement those steps
Preparing for the ICA Process	Assist countries in preparing for and undergoing the International Consultation and Analysis (ICA) process	Identification of necessary preparatory steps at national level and of capacities needed	Guiding document with explanations and proposed preparatory activities
Practice Study on GHGI Inventories in the Waste Sector	Assist countries in improving their GHG inventories in the waste sector	Good Practice study highlighting key issues to for developing GHG estimates in the waste sector and following the IPCC Guidelines	Technical information on elements to consider when developing GHG inventory estimates for the waste sector

Milestones of the Information Matters Project in the Philippines

Ms. Sandee Recabar, Division Chief of Implementation Oversight Division, Climate Change Office - Climate Change Commission (CCO-CCC)

The implementation of the IM project aims to address key challenges in terms of reporting to the UNFCCC, i.e. to lessen dependence on the use of international consultants in developing main sections of climate reports, hence strengthening in-country capacity. The identification of capacity building activities under the IM project underwent numerous consultations with line agencies and relevant stakeholders guided by government directives and policies. As presented in the timeline below, the IM project kicked off in 2013 and was continuously implemented to support the country in enhancing capacities for climate reporting through implementation of tailored-fit capacity building activities.

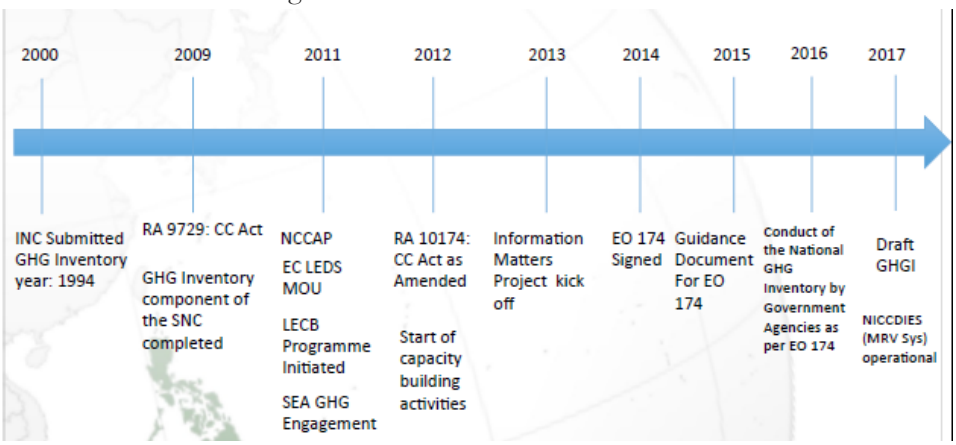


Figure 4. Timeline of Initiatives for GHG inventories in the Philippines

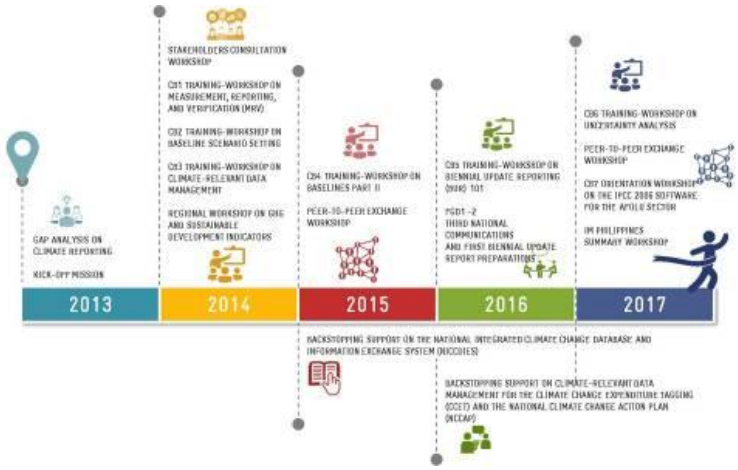


Figure 5. Timeline and Activities of IM project in the Philippines

The capacity building activities include trainings on domestic MRV architecture, development of baselines, climate relevant data management, the development of BUR, uncertainty analysis and 2006 IPCC Guidelines and Software for AFOLU Sector. Each training was a combination of lectures and hands-on exercises, post assessment exam/quiz and discussion on ways forward with timelines to mainstream into actual plans and programs of the government. In addition, the trainings are matched with the chapters of BUR development (Figure 6). The Philippines further hosted the Asia peer-to-peer exchange on GHG and non-GHG indicators in 2014 organised with support from the GIZ projects IM and Partnership for Transparency in the Paris Agreement (former: *International Partnership for Mitigation and MRV*).

In terms of policies, the IM project also provided backstopping to the CCC, developing the national integrated climate change database and information system (NICCDIES) (Figure 7).

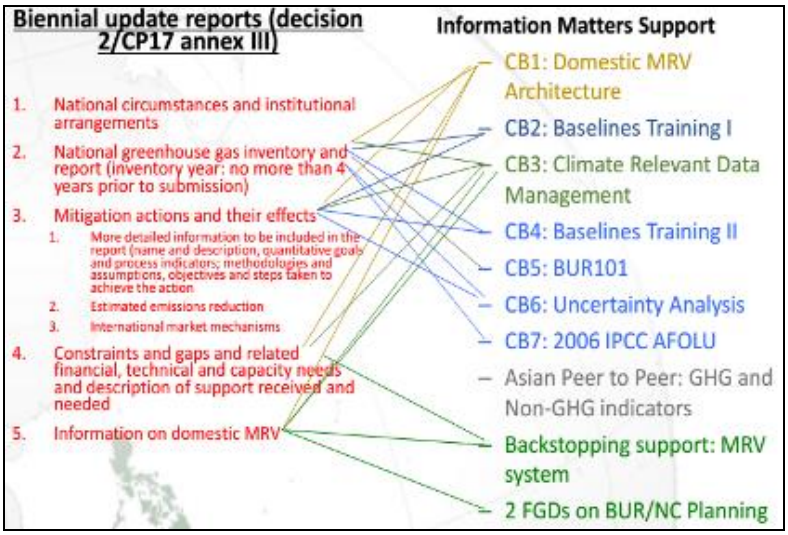


Figure 6. Matching of IM Capacity Building with BUR Chapters

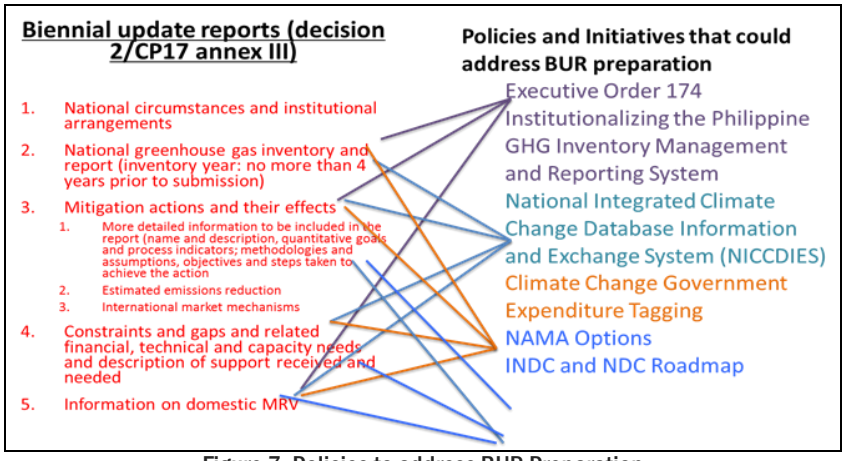


Figure 7. Policies to address BUR Preparation

Plenary Presentations: Overview of the IPCC 2006 Inventory Guidelines for AFOLU and Features of the 2006 IPCC Inventory Software

Overview of the 2006 IPCC Greenhouse Gas Inventory Tool

Dr. Florencia Pulhin, Forestry Development Center, UPLB-CFNR

The 2006 IPCC Guidelines for National Greenhouse Gas Inventories provide methodologies for estimating national inventories of anthropogenic emissions by sources and removals by sinks of GHGs. The guidelines were prepared in response to an invitation by the Parties to the UNFCCC and to assist Parties in fulfilling their commitments under the UNFCCC on reporting on inventories.

The guidelines contain five (5) volumes, Volume 1 outlines basic steps in inventory development and offers general guidance in GHG emissions and removals estimates, while Volumes 2 to 5 offer guidance for estimates in different sectors of the economy.

Volume 4 covers an entire chapter for the AFOLU sector to allow better integration of information on the pattern of land use. It also facilitates a more consistent use of activity data (e.g. fertilizer application) relevant for both agriculture and other land uses to reduce or avoid the possibilities for double counting or omission.

There are four (4) sources of emissions and removals in the AFOLU sector: biomass, dead organic matter, soils, and livestock.

Table 3. Sources of Emissions and Removals in the AFOLU Sector

Sources of Emissions and Removals	Description
Biomass	• Plant biomass - main conduit for CO_2 removal from the atmosphere. • Large amounts of CO_2 transferred between atmosphere and terrestrial ecosystems through photosynthesis and respiration • Harvested wood requires additional consideration because some of the carbon maybe stored in wood products in use and in landfills for years to centuries • Fires not only return CO_2 to the atmosphere through combustion of biomass, but also emit GHGs, directly or indirectly, including CH_4, N_2O, NMVOC, NO_x and CO.
Dead Organic Matter	• Bulk of biomass production contained in living plant material is eventually transferred to dead organic matter (DOM) pools (i.e., dead wood and litter) • Some DOM decomposes quickly, returning carbon to the atmosphere, but a portion is retained for months to years to decades. • Land use and management influence carbon stocks of dead organic matter by affecting the decomposition rates and input of fresh detritus. Losses due to burning dead organic matter include emissions of CO_2, N_2O, CH_4, NO_x, NMVOC, and CO.
Soils	• As dead organic matter is fragmented and decomposed, it is transformed into soil organic matter (SOM). • SOM includes a wide variety of materials that differ greatly in their residence time in soil

	• Factors affecting soil organic carbon stocks land-use and management activities that affect litter input rates and soil organic matter loss rates amount of harvested biomass removed as products and how much is left as residues • Factors affecting soil organic carbon stocks tillage intensity climate variability and other environmental factors affect soil C dynamics • In flooded conditions, such as wetland environments and paddy rice production, a significant fraction of the decomposing dead organic matter and soil organic matter is returned to the atmosphere as CH_4.
Livestock	• Animal production systems, significant sources of CH_4 through enteric fermentation in digestive system • Management decisions about manure disposal and storage affect emissions of CH_4 and N2O • Volatilization losses of NH_3 and NO_x from manure management systems and soils leads to indirect GHG emissions.

In terms of preparing for the inventory of the AFOLU sector, there are four (4) steps to follow:

1. Identify land use management;
2. Identify major animal types and manure management systems:
3. Define the tier/s to be used:
    - Tier 1 - simplest to use, equations and default parameter values (e.g. emission and stock change factors) are provided in the guideline.
    - Tier 2 - can use the same methodological approach as Tier 1 but applies emission and stock change factors that are based on country or region-specific data, for the most important land-use or livestock categories.
    - Tier 3 - higher order methods are used, including models and inventory measurement systems tailored to address national circumstances, repeated over time, and driven by high-resolution activity data and disaggregated at sub-national level;
4. Identify key categories:
    - Key sources/sink categories have a significant influence on a country's total inventory of GHGs in terms of the absolute level, trend, or uncertainty in emissions and removals.
    - Key category analysis helps a country to achieve the most reliable inventory given the resources available.
    - Key category analysis is required to identify the following:
        - Significant land-use and management activities;
        - Significant land-use or livestock (sub)category;
        - Significant CO_2 emissions or removals by sinks from various carbon pools;
        - Significant non-CO_2 gases and from what categories these come from Tier required for reporting.

Comparison of IPCC 2006 and ALU Software

Dr. Florencia Pulhin, Forestry Development Center, UPLB-CFNR

The table below summarizes the comparison of features of the 2006 IPCC and ALU software, Dr. Pulhin presented to the participants.

Table 4. 2006 IPCC and ALU Software Comparison

Features	2006 IPCC Software	ALU Software
Based on IPCC Guidelines	✓	✓
Tiers 1 and 2	✓	✓
Manage activity data, emission factors, emission results	✓	✓
Can incorporate GIS-based data on land use and land use change derived from remote sensing imagery	✕	✓
Facilitates the development of emission maps to the extent that activity data and/or emission factors vary spatially	✕	✓
Institutional memory for long-term sustainability of GHGI	✓	✓
Reporting is done in spreadsheets	✓	✓
Self-contained database with data used in inventory as well as documentation for references and results	✓	✓
Provides a relational database structure between Agriculture and Land Use, Land-Use Change and Forestry (LULUCF)	✓	✓
With several options for stratifying the land base or livestock population	✓	✓
Provides utilities that facilitate documentation	✓	✓
Facilitates mitigation analysis using the inventory as the baseline	✕	✓

IPCC 2006 GHG Inventory Software: How to Get Started

Dr. Florencia Pulhin, Forestry Development Center, UPLB-CFNR

The table below details the step-by-step guide in setting up the 2006 IPCC GHGI Software that was used during the training

Table 5. Step-by-Step Guide in Setting-up the IPCC 2006 Software

Main Steps	Sub-Steps
Define Super User – A Super-user is responsible for identifying additional users and has full control over the application and corresponding database.	Fill the required information (login, password, etc.), then Click OK.
Choose desired Region and Country/Territory using the drop down menu	Click OK
Create Inventory Year using the drop down menu	Click Create
Set Inventory Preferences by choosing start and end inventory years and base year for assessment of uncertainty	Click OK
Set default CO_2 Equivalents using Administrate/CO_2 Equivalents menu	• Use Type list to select desired CO_2 Equivalent type • Click Set as default button to set it as default – new default CO_2 • Equivalent type will be indicated in the status bar located at the bottom of the main software window. • Click OK Add custom CO_2 Equivalent type • Click Add type button • Enter the unique name of the new type when asked and click OK - new custom CO_2 Equivalent type will appear within the Type list. Use grid to go through all gases within all Gas groups and enter desired CO_2 Equivalent Values
Define users by clicking Administrate to access User Management system, which is designated for adding new users and editing and deleting existing users in the currently open database. • Users contains the list of ordinary users • Access to Administrate section of the software is prohibited • Can see and edit only worksheets specified as Allowed Worksheets	Adding new user • Enter the desired unique login name into the Login textbox • Use Superuser checkbox to define user as a Superuser (checked) or ordinary user (unchecked) • In case of ordinary user define Allowed Worksheets for the user to work with Click Set password button to explicitly set password for new user • Click Add new button to save new user into database
How to Save database	Use Database/Save as menu to save currently open database to a new file. • Select destination folder and file

	• Choose whether to remove password protection. Note: For safety, do not remove password protection • Decide whether to compress (ZIP) database file (compressed database file must be uncompressed (unzipped) before opening it in the software).

Additional preferences can be navigated under the application preferences tab. This tab includes settings on general, database, worksheets, reports, inventory year, and grid.

a. General: Opens a dialog window that allows the user to adjust preferred working area settings such as appearance of dialogs, database related preferences and backup, default number of decimal places in worksheets and reports, range of inventory years, and coloring and other properties of grids.

b. Database: Includes check boxes of last used database at application startup, show login dialog after opening database, show database properties after opening database, show open database dialog after closing current database and prompt before closing current database. It also has a backup option.

c. Worksheets: Includes check boxes for options of opening the worksheets window after login, maximization of worksheet windows, and expansion of full 2006 IPCC Category tree structure by default, and automatic navigation to last visited 2006 IPCC category. It also has an option for the maximum number of decimal places.

d. Reports: There are two kinds of reports: summary table and sectoral table.

e. Inventory Year: This has the options for start and end inventory year and the base year for assessment of uncertainty in trend.

f. Grid: Includes various options for the appearance of the report.

Discussion Highlights

- **On having dummy data due to lack of available data, e.g. data on animal types and manure management**

A remark indicating that such animal and manure management are not included can be written in the GHGI report and later on included in the template once datasets are collected. However, this concern should be given priority by the appropriate lead agencies (DA and PSA).

- **On the preference regarding which software is being used more often.**

The 1996 IPCC software was used in the GHGI for the Initial and Second National Communications (NCs) since other sectors are already using the same software. However, the updated software in 2006 was not yet circulated during the involvement of DA, DENR, and PSA, hence the ALU software was used by these agencies. It is apparent that ALU has more functionalities than the IPCC software, however since some of the developing countries find it difficult to generate data, IPCC is being used initially, then they shift to ALU software as datasets are being generated. The advantage of using the IPCC software is that despite of incomplete data, an estimate can still be calculated.

Nonetheless, it should be noted that regardless of which tool, CCC must be informed of the agencies' tool preference given that they need to consolidate the data.

- **On the use of land cover stats from National Mapping and Resource Information Authority with respect to the use of ALU.**

Land cover data between 2010 and 2015 is available, however the AFOLU sector needs a

conversion that would fit in the different categories in the ALU software.

Breakout Session: Hands-on Exercise using the 2006 IPCC Software

Two hands-on exercises were conducted and the participants worked individually using data on agriculture and other land use. Step-by-step guides were developed by Dr. Pulhin for both exercises and handed-over to the participants, so they would be able to easily use the software. The participants took note that the 2006 IPCC Software is easier to use than the ALU software especially with the step-by-step guide provided by Dr. Pulhin.

After the hands-on exercises, the participants were asked to group themselves according to their sector respective representations (AFOLU). The groups were asked to discuss the following questions and to present their outputs back in the plenary. To answer question three, Dr. Pulhin distributed an overview about all data sources the 2006 IPCC Software collects for the AFOLU sector.

1. What is your feedback on the 2006 IPCC software? What worked well and what was difficult?
2. Is the 2006 IPCC software applicable for your sector? Please state reasons, why or why not.
3. Based on the data list, which data gaps do exist in your sector? Please discuss: How could those gaps be overcome?

Table 6. Workshop Output for Questions 1 to 3

Groups	Feedback		Applicability		Gaps	How to Address
	(+)	(-)	(+)	(-)		
Other Land Use (human settlements, grassland, wetlands)	• The function of import and export is good with .xls, .csv, and other spreadsheets • Easy to generate report	• Interface is not user-friendly as there are too many buttons and drop downs that are quite confusing at times • Generate time-series data first • No possibility to check the accuracy of the data encoding (if not imported from excel)	•	• Not applicable for the Biodiversity sector: wetland definition is not the same for IPCC and BMB. • HLURB: categories for land use are different in the software, only settlements are included however for HLURB there are specific categories for human settlements.	• Other classification for other land use	• Capacity building in adopting and generating data • Advance research studies • Define and harmonize the categories
Forestry (FMB/BMB)	• Easy to use and generate report • Export of data is easy • Some of the data are already given	• Incomplete categories • Data encoding is tedious	• Applicable to FMB as some of the data needed are already available	• Not applicable to BMB since protected area is not included in the categories	• Data on areas disturbed • Consolidated data on biomass studies	• Data sharing • Research • Coordination with agencies that have the data
Agriculture	• Easier to use than ALU	• No Quality Assurance/ Quality Control (QA/QC) compared to ALU	• Applicable to Agriculture	•	• Manure management Crops: agricultural residue • Fertilizer application	• Coordination with DA.

Closing Remarks

Dr. Florencia Pulhin thanked the participants for providing time to the workshop. She hoped that the issues raised (i.e. data gaps, coordination) will be discussed by their respective offices so data access and availability can be improved accordingly. In terms of data gaps, she suggested that these data, for instance fuel wood consumption, can be incorporated in local tools like the Community-based Monitoring System.

On behalf of the CCC, ***Mr. Francisco Dacumos*** thanked the participants for attending the workshop, Dr. Pulhin for providing the expertise, and SupportCCC II and IM project Team for hosting the workshop. He invited the participants for the IM project Closing event on 31 August 2017, where tools used in the capacity building activities will be handed over to CCC and each department.

Dr. Bjoern Surborg, Principal Advisor of Support CCCII project expressed his appreciation for the participants for spending the two days and being able to apply the tools in their respective sectors. He stressed that information does matter, as what the message of the project conveys, and that as the participants shared, there is a recurring need for more cooperation towards addressing data gaps to improve the country's GHGI. While the Philippines is a very small contributor of GHG emissions, it has a strong growth trajectory where data and information are tremendously important towards climate action.

Dr. Surborg encouraged everyone to continuously update the technical knowledge to fill up the necessities, not just to comply with the reporting requirements to UNFCCC, but also to support planning for national climate action. Although the IM project will officially close on 31 August, Dr. Surborg is confident that the CCC will be able to continue the work started through the project.

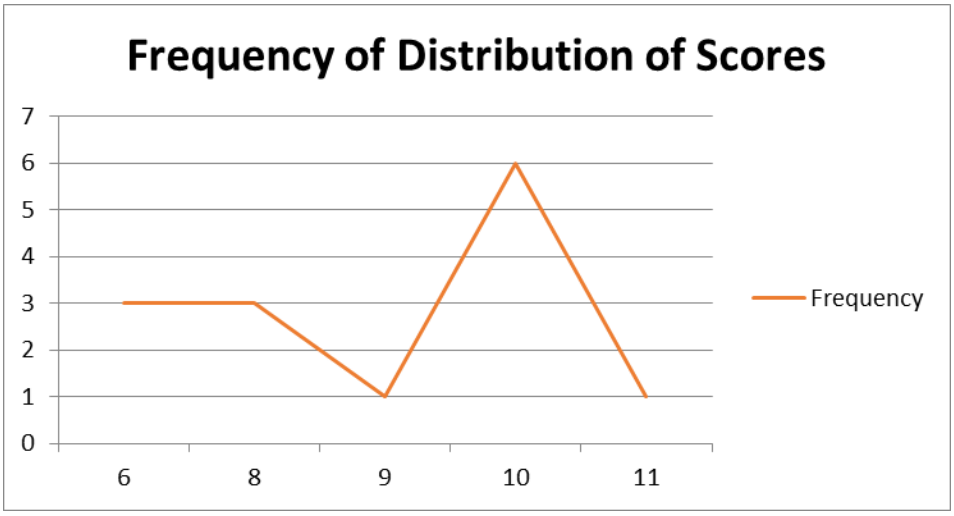
Post-Training Test Scores

A 10-item post-training test was developed by the trainer to gauge the level of understanding of the participants on the 2006 IPCC Guidelines and Software. The highest possible score obtainable was 12.

The graph below shows the frequency distribution of scores garnered by the participants. A total of 14 participants took the test. The highest score registered was 11 while the lowest was 6. The lowest score obtained represents 50% of the total possible correct answers.

The group's average was 8.8, median was 9, and mode was 10. Standard deviation was 1.72 based on total population.

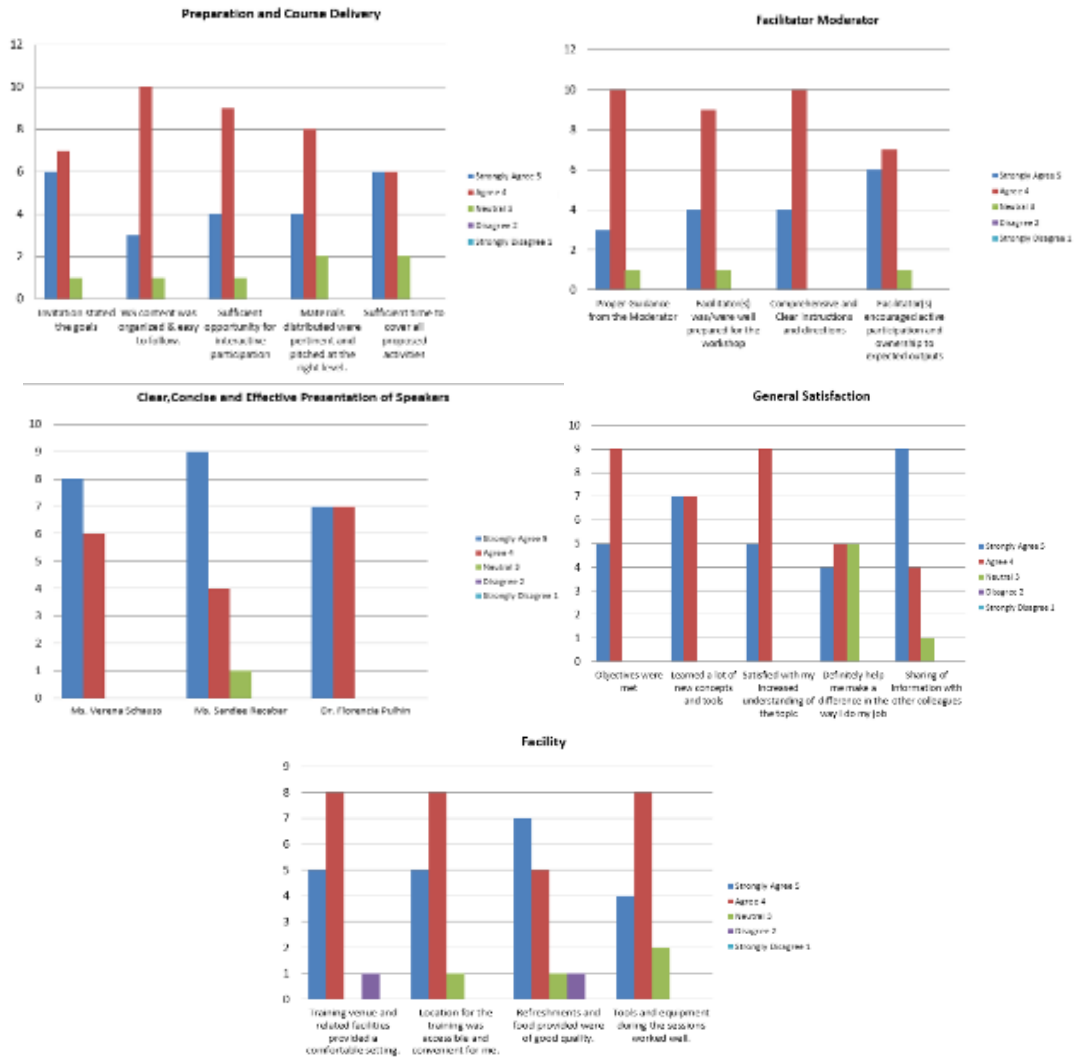
Figure 8. Frequency of Distribution of Post-Test Scores



Post-Training Evaluation Result

The participants were requested to evaluate the training by rating five (5) criteria; preparation and course delivery, facilitation, speakers, general satisfaction, and venue. The evaluation indicated six (6) ratings: strongly agree (5); agree (4); neither agree nor disagree (3); disagree (2); strongly disagree (1); and no answer (0). In general, participants showed much interest on the training given that majority of the participants' general satisfaction was rated "4,3". The respondents have agreed that workshop objectives were met with a weighted average of 1.57.[1] The figure below demonstrates the result for the evaluation criteria, while the next table details additional comments from the post-training evaluation.

Figure 9. Evaluation Result for Each Criterion



[1] Each evaluation score is assigned with weight to determine the relative importance of each quantity on the average. Thus, the following is the assigned weight for each score: strongly agree (5)=2, agree (4)=1, neutral (3)=0, disagree (2)=-1, and strongly disagree (1)=-2

Specific comments were:

Questions	Comments
What will you do differently in your work/practice setting as a result of this workshop	• Influence implementing partner to look at GHGI as part of information for land use planning and monitoring • Aid in decision-making in analysis of local government mitigation projects/activities • I will focus in finding ways to address data gaps • Re-echo the training/share knowledge to my colleagues • We will consider using the 2006 IPCC Software • Propose for consideration of capacity building activities to capture different carbon accounts/GHG emissions for different ecosystem types (forest formations, wetlands) to capture biodiversity • Think of ways of how this could be used in my work • Validation among 2006IPCC, ALU and spreadsheets maintained by agencies
What aspects of the workshop could be improved	• Having a mix of sectors to be included i.e. settlements • Flow of discussion • The default values and other values could have been organized better • Interpretation of results. We need more time to really results generated by the software • More process flow and examples • Step-by-step processing/instruction for easy navigation • More exercises that will allow participants to use the software and interpret results • More synthesis on integration of the usefulness of the tool • Concepts be discussed more
Other Remarks	• The venue is not for a workshop, lights are dim and not sound-proof • Excellent workshop • Great workshop, I really learned a lot • Thank you for the opportunity to attend this workshop. Added understanding and knowledge to me

Annexes

1. *Program Agenda and Concept Note*

Orientation Workshop on IPCC 2006 Guidelines and Software for Greenhouse Gas Inventories in the Agriculture, Forestry, and Other Land use (AFOLU) Sector

August 24-25, 2017 * Microtel by Wyndham, Commonwealth Avenue, Quezon City

CONCEPT NOTE

Background

Greenhouse Gas (GHG) inventories provide information on greenhouse gas emissions from different gases, sources and sectors as well as removals from sinks. With this information collected, appropriate mitigation actions or policies can be identified, baseline scenarios can be developed, and projections can be formulated. In addition, country parties to the United Nations Framework Convention on Climate Change (UNFCCC) are also required to report on their inventories as part of their National Communications (NCs) reported every four years and updated every two years through the Biennial Update Reports (BURs), both to be undertaken in consideration of national capacities and availability of support.

UNFCCC Decision 17/CP.8 recommends the use of the Intergovernmental Panel on Climate Change (IPCC) guidelines in the estimation and reporting of national GHG inventories. The most current version of the IPCC Guidelines on GHG inventories was released in 2006. Various tools are available for use by country parties supporting the preparation of inventories (e.g. UNFCCC Secretariat - Greenhouse Gas Inventory Software for non-Annex I Parties (NAIIS), IPCC Inventory Software 2006, Colorado State University - Agriculture and Land Use National Greenhouse Gas Inventory Software (ALU), Stockholm Environment Institute - Long-range Energy Alternatives Planning System (LEAP)). National methodologies may also be used by non-Annex I Parties. The decision on which tools to use rests upon country parties and their stakeholders, depending on available data, capacities, and resources, as long as the methodologies chosen are “consistent, transparent and well documented”.

The Philippines has prepared two GHG inventories for the sectors (1) Agriculture and (2) Land Use and Forestry in 1994 and 2000 through the application and usage of data indicated in the 1996 and 2006

IPCC guidelines, and local sources and methodologies. Manual estimation, IPCC Software, and UNFCCC NAIIS were utilized as well.

For further improvement of GHG inventory preparation, capacity building activities were conducted, and an array of estimation tools were made available for utilization by the sectoral agencies, one of which is the ALU Software currently being used by the AFOLU sectoral agencies. For the preparation of the next GHG inventory to support the formulation of the Philippines' Nationally Determined Contribution (NDC) roadmap as well as the preparation of its Third NC and first Biennial Update Report (FBUR), it was agreed among sectoral agencies that the 2006 IPCC Guidelines and Software will be used, alongside enhanced access to and quality of necessary activity data and emission factors.

Objectives

In general, the *Orientation Workshop* aims to enhance the capacities of government agencies involved in preparing and reporting GHG inventories for the AFOLU sector, specifically through the use of the 2006 IPCC Software and building on the participants' familiarity with the 2006 ALU Software.

Specifically, this activity aims for the participating government agencies to:

- Obtain deeper understanding of the GHG inventory compilation in the AFOLU sector based on the 2006 IPCC Guidelines (e.g. approaches to data collection, selection and application of appropriate estimation methodologies for emissions and removals as well as conducting key category analysis for the inventory);
- Utilize "Decision Trees" recommended in the 2006 IPCC Guidelines to determine the appropriate tiered methodology and demonstrate transparency in the choice of GHG estimation methods for each sector;
- Compare and contrast processes in GHG inventory preparation through the use of the 2006 IPCC Software and the 2006 ALU Software.

At the end of the two-day activity, the participants would have improved familiarity of the functionalities of the 2006 IPCC and the 2006 ALU software for GHG inventories in the Agriculture, Forestry, and Other Land Use (AFOLU) sector.

Format and Participants

The delivery of the *Orientation Workshop* will be conducted in the form of input presentations with hands-on exercises using the 2006 IPCC Software specifically on the AFOLU sector. Participants will be from government agencies involved in GHG inventories compilation for the AFOLU sector.

Agenda

ACTIVITY	RESPONSIBLE	TIME
Day 1		
PRELIMINARIES		
Registration	Secretariat	8:30 – 9:00
National Anthem	All	
Opening Remarks	Sandee Recabar, CCC	9:00 – 9:15
• Introduction of Participants	All	9:15 – 9:30
Setting the Scene: • Update: IM Global • Update: IM Philippines and National Climate Reporting	Verena Schauss, IM Global Sandee Recabar, CCC	9:30 – 9:45
• Levelling-off on Level of Knowledge/Experience • Board of Worries / Expectations Check	Mary Martha Merilo, IM Ph	9:45 – 10:00
• Program and methodology of the workshop	Florencia Pulhin	10:00 – 10:15
Segment I Overview of Key Concepts and Issues on the 2006 IPCC GHG Inventory Tool for AFOLU *Output: Participants would have gained knowledge and clarified issues on the 2006 IPCC GHG Inventory Tool for AFOLU*		
Overview of the 2006 IPCC Guidelines for the AFOLU • Greenhouse gas emissions and removals in the AFOLU Sector • Inventory preparation for the AFOLU Sector	Florencia Pulhin	10:15 – 11:00
Introduction: 2006 IPCC GHG Inventory Tool for AFOLU • Difference between ALU Software and IPCC Software • Interface and Functionalities of the 2006 IPCC GHG Inventory Tool for AFOLU	Florencia Pulhin	11:00 – 12:00
Lunch Break		12:00 – 13:00
Getting started with the 2006 IPCC GHG Inventory Tool • Setting up the software (First Run) • Main Menu Structure • Worksheets and Data Entry • Sample AFOLU Worksheet	Florencia Pulhin	13:00 – 16:00
Day 2		
Recap of Day 1	Mary Martha Merilo, IM Ph	8:30 – 9:00
Segment II Exploring 2006 IPCC GHG Inventory Tool for AFOLU *Output: Participants would have gained experience on how to use 2006 IPCC GHG Inventory Tool for AFOLU*		
Hands-on Exercise on using the 2006 IPCC GHG Inventory Tool (Plenary) • Step-by-step instructions on using the tool	Florencia Pulhin	9:00 – 11:00
Hands-on Exercise on using the 2006 IPCC GHG Inventory Tool (Grouped by Sector)	Florencia Pulhin	11:00 – 12:00
Lunch Break		12:00 – 13:00
Hands-on Exercise on using the 2006 IPCC GHG Inventory Tool (Grouped by Sector), continuation	Florencia Pulhin	13:00 – 14:30
General Comments/Sharing by the participants of the results of the GHG assessment undertaken using 2006 IPCC GHG Inventory Tool for AFOLU	Verena Schauss, IM Global Mary Martha Merilo, IM Ph	14:30 – 15:00
Wrapping-up • Final notes on using the 2006 IPCC GHG Inventory Tool for AFOLU • Quiz	Florencia Pulhin	15:00 – 15:30
Closing		
Way forward	Sandee Recabar, CCC	15:30 – 15:45
Workshop Evaluation	Participants	15:45 – 16:00

2. Group Exercises

Orientation Workshop on IPCC 2006 Guidelines and Software for Greenhouse Gas Inventories in the Agriculture, Forestry, and Other Land use (AFOLU) Sector

August 24-25, 2017 * Microtel by Wyndham, Commonwealth Avenue, Quezon City

Steps in Using the 2006 IPCC GHG Inventory Software

Agriculture

A. Livestock

Step 1. Click **Dairy Cows** in the **IPCC Categories Panel**
Step 2. Click **Livestock,** then **Livestock Manager** will appear
Step 3. Under Column **Livestock Subcategory**, type the name of animal **'Dairy Cows'**
Step 4. Under the Column **Average Annual Population**, enter number of heads of Dairy Cows
Step 5. Using the drop down menu, choose **Typical Animal Mass Per Day** (Table 1), **Excretion Rate Per Animal Per Day** (Table 1)
Step 6. Click **Save**
Repeat Steps 3-6 for all livestock types.
Step 7. Click **Dairy Cows** in the **Livestock Manager**
Step 8. Click **Manure Management System (MMS)** and check appropriate **MMS (Table**
Repeat Steps 7- 8 for all livestock types.
Step 9. Click **Save**
Step 10. Click **Region** in the **Livestock Manager**
Step 11. Type **Asia,** then choose **Average Temperature** (≥ 28)
Step 12. Click **Save**
Step 13. Close **Livestock Manager**
Step 14. Click **Dairy Cows** in the **IPCC Categories Panel**, using the drop down menu, choose **Emission Factor**
Repeat Steps 14 for all livestock types.
Step 15. Under **Manure Management,** Click **Dairy Cows.**

Step 16. Click **Region, Livestock and MMS Association** located in the upper portion of the **Manure Management** worksheet**.** Using the drop down menu, specify the **Region** and **Temperature**

Step 17. At the left of **Asia**, click the **+ sign**. A sub worksheet will appear. Using the drop down menu, choose **Dairy Cows**. Indicate the number of heads of Dairy Cows in the column **Number of Animals**.

Step 18. At the left of **Dairy Cows**, click the **+ sign**. A sub worksheet will appear. Using the drop down menu, choose the **Manure Management System**. Indicate the **Fraction of Manure in System**, **Fraction of N loss** (1.0) and **N in Organic Bedding (0.5)**

Step 19. Click **Save**

Step 20. Click Subworksheet **CH4 Emissions from Manure Management.** Using the drop down menu choose the **Emission Factor.**

Step 21. Click **Save**

Step 22. Click Subworksheet **N2O Emissions from Manure Management Systems.**

Step 23. Click **Save**

Repeat Steps 15-23 for all livestock types.

Table 1. Population and Manure Mangement of Livestock

Type of Animal	Population	Typical Animal Mass Per Day	Excretion Rate Per Animal Per Day	Manure Management System	Emission factor (CH4)	Emission factor (N2O
Dairy Cows	50000	350	0.47	Daily spread	31	0
Other Cattle	20000	319	0.34	Pasture/Range/ Paddock	1	0
Buffalo	25000	380	0.32	Burned for fuel	2	21
Goats	33000	30	1.37	Pasture/Range/Paddock	0.22	0
Horses	15000	238	0.46	Pasture/Range/Paddock	2.19	0
Swine	100000	28	0.50	Uncovered anaerobic lagoon	7	0
Poultry	400000	1.5	0.82	Poultry manure with litter	0.02	0

Dr. Florencia B. Pulhin
Forestry Development Center
UPLB-CFNR

Orientation Workshop on IPCC 2006 Guidelines and Software for Greenhouse Gas Inventories in the Agriculture, Forestry, and Other Land use (AFOLU) Sector

August 24-25, 2017 * Microtel by Wyndham, Commonwealth Avenue, Quezon City

Steps in Using the 2006 IPCC GHG Inventory Software

Land

REMAINING THE SAME LAND USE (USE TABLE 1 FOR THE DATA INPUTS)

A. Forestland Remaining Forestland

Step 1. Click **Forestland Remaining Forestland** found in the **2006 IPCC Land Use Categories**, Click **Land Manager Type, Land Use Subcategories** will appear.

Step 2. Click **Forestland.** Then click **Add. Common Land Type Data** window will appear.

Step 3. Indicate in **Country/Territory** (Philippines)

Step 4. Indicate in **Continent** (Asia)

Step 5. Indicate in the **Land Use Subcategory** (Closed Forest)

Step 6. Using the drop down menus, fill up the needed information.

Step 7. Click **Save.**

To create **Land Use 'Open Forest'** repeat **Steps 1-4.**

Step 8. Indicate the **Land Use Subcategory** (Open Forest)

Step 9. Using the drop down menus, fill up the needed information.

Step 10. Click **Save.**

Step 11. Enter values for **area** (ha).

Step 12. Click **Save.**

Step 13. Click Subworksheet **Loss of Carbon in Wood Removals,** enter value for **Annual Wood Removal**

Step 14. Click Subworksheet **Loss of Carbon in Fuelwood Removals,** enter value for **Annual Volume of Fuelwood Removal**, **Annual Volume of Fuelwood Removal as Tree Parts** and **Wood Density**

Step 15. Click **Loss of Carbon from Disturbances**, enter value for **Area Affected by Disturbances**

Step 16. Enter **Fraction of Biomass Lost in Disturbance**

B. Cropland Remaining Cropland

Step 1. Click **Cropland Remaining Cropland** found in the **2006 IPCC Land Use Categories**, Click **Land Manager Type, Land Use Subcategories** will appear.

Step 2. Click **Cropland.** Then click **Add. Common Land Type Data** window will appear

Step 3. Indicate in **Country/Territory** (Philippines)

Step 4. Indicate in **Continent** (Asia).

Step 5. Indicate in the **Land Use Subcategory (Perennial)**

Step 6. Click on **Perennial Crops** for **Cropland Data**

Step 7. Using the drop down menus, fill up the needed information

Step 8. Click **Save.**

To create **Land Use 'Annual Crops'** repeat **Steps 1 - 4**.

Step 9. Indicate in the **Land Use Subcategory (Annual Crops)**

Step 10. Click on **Annual Crops** for **Cropland Data**

Step 11. Using the drop down menus, fill up the needed information

Step 12. Click **Save.**

Step 13. Enter values for **area** (ha).

Step 14. Click **Save.**

Step 15. Click on the **Subworksheet Annual Change in Carbon Stocks in Mineral Soils,** enter values for **Time Dependence of Stock Change Factors (D) or Number of Years Over a Single Inventory Time Period.**

Step 16. Click **Save.**

C. Grassland Remaining Grassland

Step 1. Click **Grassland Remaining Grassland** found in the **2006 IPCC Land Use Categories**, Click **Land Manager Type, Land Use Subcategories** will appear.

Step 2. Click **Grassland.** Then click **Add. Common Land Type Data** window will appear

Step 3. Indicate in **Country/Territory** (Philippines)

Step 4. Indicate in **Continent** (Asia).

Step 5. Indicate in the **Land Use Subcategory (Grassland)**

Step 6. Using the drop down menus, fill up the needed information

Step 7. Click **Save.**

Step 8. Enter value for **area** (ha)

Step 9. Click **Save.**

Step 10. Click on the **Subworksheet Annual Change in Carbon Stocks in Mineral Soils,** enter values for **Time Dependence of Stock Change Factors (D) or Number of Years Over a Single Inventory Time Period**

Step 27. Click **Save.**

D. Flooded Land Remaining Flooded Land

Step 1. Click **Flooded Land Remaining Flooded Land** found in the **2006 IPCC Land Use Categories**, Click **Land Manager Type, Land Use Subcategories** will appear.

Step 2. Click **Wetland.** Then click **Add. Common Land Type Data** window will appear

Step 3. Indicate in **Country/Territory** (Philippines)

Step 4. Indicate in **Continent** (Asia)

Step 5. Indicate in the **Land Use Subcategory (Flooded land)**

Step 6. Using the drop down menus, fill up the needed information

Step 7. Click **Save.**

Step 8. Enter value for **area** (ha).

Step 9. Click **Save.**

E. Peatland Remaining Peatland

Step 1. Click **Peatland Remaining Peatland** found in the **2006 IPCC Land Use Categories**, Click **Land Manager Type, Land Use Subcategories** will appear.

Step 2. Click **Wetland.** Then click **Add. Common Land Type Data** window will appear

Step 3. Indicate in **Country/Territory** (Philippines)

Step 4. Indicate in **Continent** (Asia).

Step 5. Indicate in the **Land Use Subcategory (Peatland)**

Step 6. Using the drop down menus, fill up the needed information

Step 7. Click **Save.**

Step 8. Enter value for **area** (ha).

Step 9. Click **Save.**

Step 10. Click on the **Subworksheet 1 of 3 CO_2 Emissions from Managed Peatlands** and enter **Area of Nutrient Peat Soils Managed for Peat Extraction.**

Step 11. Click on the **Subworksheet 3 of 3 CO_2 Emissions from Managed Peatlands** and enter **Air dry Amount of Extracted Peat.**

Step 12. Click on the **Subworksheet N2O Emissions from Peatlands during Peat Extraction** and enter **Area of Nutrient Peat Soils Managed for Peat Extraction.**

F. Settlements Remaining Settlements

Step 1. Click **Settlements Remaining Settlements** found in the **2006 IPCC Land Use Categories**, Click **Land Manager Type, Land Use Subcategories** will appear.

Step 2. Click **Settlement.** Then click **Add. Common Land Type Data** window will appear

Step 3. Indicate in **Country/Territory** (Philippines)

Step 4. Indicate in **Continent** (Asia).

Step 5. Indicate in the **Land Use Subcategory (Settlement 1)**

Step 6. Using the drop down menus, fill up the need information.

Step 7. Click **Save.**

Step 8. Enter value for **area** (ha)

Step 9. Click **Save.**

LAND CONVERTED TO OTHER LAND USE

A. Cropland Converted to Forestland

Step 1. Click **Cropland Converted to Forestland** from the **2006 IPCC Categories: Land: Forestland: Land Converted to Forestland.** Enter **area** (ha)**: Annuals to Closed Forest (5); Annuals to Open Forest (250); Perennials to Closed Forest (100); Perennials to Open Forest (1000)**

Step 2. Click the **Subworksheet Annual Loss of Carbon from Wood Removals,** enter **Annual Wood Removal: Perennials/Closed Forest (3000); Annuals/Closed Forest (2000); Perennials/Open Forest (4000)**

Step 3. Click the **Subworksheet Loss of Carbon from Fuelwood Removals,** enter values for **Annual Volume of Fuelwood Removal of whole trees; Annual (2000), Perennial (1000); Annual Volume of Fuelwood Removal as Tree Parts: Perennial (500), Annual (300); Wood Density Perennial/Annual (0.57), Carbon Fraction of Dry Matter: Perennial/Annual (0.47)**

Step 4. Click **Subworksheet Loss of Carbon from Disturbance, enter values for Area Affected by Disturbance: Perennial** (400**), Annual** (300**); Average Aboveground Biomass of Areas Affected: Closed Forest** (350), **Open Forest** (280); **Rattio of Below ground to Aboveground biomass: (0.37); Carbon Fraction of Dry Matter (0.47); Fraction of Biomass Lost in Disturbance (0.8).**

Step 5. Click **Subworksheet Annual Change in Carbon Stocks in Dead Organic Matter Due to Land Conversion: Enter values for Deadwood/Litter Stock Under the New Land Use Category (4) ; Deadwood/litter stock, under the old land use category (Default-0); Time Period of the transition From Old to New and Use Category (Defaut-20).**

Step 6. Click **Subworksheet Annual Change in Carbon Stocks in Mineral Soils: Enter values for Time Dependent of stock Change Factors (D) or Number of Years over a Single Inventory Time Period (Default-20).**

Grassland Converted to Forestland

Step 7. Click Grassland Converted to Forestland from the **2006 IPCC Categories: Land: Forestland: Land Converted to Forestland.** Click **Loss of Carbon from Wood Removals,** enter data of **Annual Wood Removal: Grassland to Closed Forest** (4000), **Grassland to Open Forest** (2000).

Step 8. Click **Loss of Carbon from Fuelwood Removals,** enter data of **Annual Volume of Fuelwood Removal of Whole Trees: Grassland to Closed Forest** (6000), **Grassland to Open Forest** (3000); **Annual Volume of Fuelwood Removal As Tree Parts: Grassland to Closed Forest** (6000), **Grassland to Open Forest** (3000); Wood density (0.57)

Step 9. Click **Loss of Carbon from Disturbance,** enter **Area Affected by Disturbances (ha): Grassland to Closed Forest (450), Grassland to Open Forest (390); Fraction of Biomass Lost in Disturbance: Grassland to Closed Forest (0.45), Grassland to Open Forest (0.60).**

Step 10. Click **Annual Change in Carbon Stocks in Dead Organic Matter Due to Land Conversion,** enter value of **Dead Wood/Litter Stock Under New Land Use Category (4); Grassland to Closed Forest (7), Grassland to Open Forest (6).**

Step 11. Click **Annual Change in Carbon Stocks in Mineral Soils,** enter Time Dependence of Stock Change Factors **Grassland to Closed Forest (20), Grassland to Open Forest (20).**

Wetlands Converted to Forestland

Step 1. Click Wetlands Converted to Forestland from the **2006 IPCC Categories: Land: Forestland: Land Converted to Forestland.** Click **Loss of Carbon from Wood Removals,** enter data of **Annual Wood Removal: Grassland to Closed Forest** (4000), **Grassland to Open Forest** (2000).

Step 2. Click **Loss of Carbon from Fuelwood Removals,** enter data of **Annual Volume of Fuelwood Removal of Whole Trees: Wetlands to Closed Forest** (6000), **Wetlands to Open Forest** (3000); **Annual Volume of Fuelwood Removal As Tree Parts: Grassland to Closed Forest** (6000), **Grassland to Open Forest** (3000); Wood density (0.57)

Step 3. Click **Loss of Carbon from Disturbance,** enter **Area Affected by Disturbances (ha): Wetlands to Closed Forest (450), Wetlands to Open Forest (390); Fraction of Biomass Lost in Disturbance: Grassland to Closed Forest (0.45), Grassland to Open Forest (0.60).**

Step 4. Click **Annual Change in Carbon Stocks in Dead Organic Matter Due to Land Conversion,** enter value of **Dead Wood/Litter Stock Under New Land Use Category (4); Grassland to Closed Forest (7), Grassland to Open Forest (6).**

Settlements Converted to Forestland

Step 1. Click Settlements Converted to Forestland from the **2006 IPCC Categories: Land: Forestland: Land Converted to Forestland.** Click **Loss of Carbon from Wood Removals,** enter data of **Annual Wood Removal: Grassland to Closed Forest** (4000), **Grassland to Open Forest** (2000).

Step 2. Click **Loss of Carbon from Fuelwood Removals,** enter data of **Annual Volume of Fuelwood Removal of Whole Trees: Wetlands to Closed Forest** (6000), **Wetlands to Open Forest** (3000); **Annual Volume of Fuelwood Removal As Tree Parts: Grassland to Closed Forest** (6000), **Grassland to Open Forest** (3000); Wood density (0.57)

Step 3. Click **Loss of Carbon from Disturbance,** enter **Area Affected by Disturbances (ha): Wetlands to Closed Forest (450), Wetlands to Open Forest (390); Fraction of Biomass Lost in Disturbance: Grassland to Closed Forest (0.45), Grassland to Open Forest (0.60).**

Step 4. Click **Annual Change in Carbon Stocks in Dead Organic Matter Due to Land Conversion,** enter value of **Dead Wood/Litter Stock Under New Land Use Category (4); Grassland to Closed Forest (7), Grassland to Open Forest (6).**

Do the following:

1. Forestland Converted to Cropland
2. Grassland Converted to Cropland
3. Settlements Converted to Cropland
4. Forestland Converted to Grassland
5. Cropland Converted to Grassland
6. Settlements Converted to Grassland
7. Land Converted to Peat Extraction
8. Land Converted to Flooded Land
9. Forestland Converted to Settlements
10. Cropland Converted to Settlements
11. Grassland Converted to Settlements

Biomass Burning

Biomass Burning in Forest Land

1. Choose from column **Subcategories for Reporting Year**, fill out data with red marks.

Biomass Burning in Croplands

1. Choose from column **Subcategories for Reporting Year**, fill out data with red marks.

Biomass Burning in Grassland

1. Choose from column **Subcategories for Reporting Year**, fill out data with red marks.

Liming

1. Choose from column **Land Type**, fill out data with red marks.

Urea Application

1. Choose from column **Land Type**, fill out cells with red marks.

Direct N2O Emissions from managed soils

1. In Subworksheet Organic N Applied to Managed Soils **compost applied, sewage** enter values of **sludge applied, other organic amendments, fraction of N from organic additions**
2. In **subworksheet 1 of 3 Direct N2O Emissions from Managed Soil**s fill out cells with red marks.
3. In **subworksheet 3 of 3 Direct N2O Emissions from Managed Soil**s **– Urine and Dung Inputs to Grazed Soils** fill out cells with red marks

Indirect N2O Emissions from Manure Management

1. **In subworksheet 1 of 2 Indirect N2O Emissions from Manure Mangement,** fill out cells with red marks.

Rice cultivations

1. Choose from column **Rice Ecosystem**.
2. Enter values for **Annual area harvested** and cells with red marks

Table 1. Data Inputs to land remaining the same land use

Parameter	Forestland Remaining Forestland		Cropland Remaining Cropland		Grassland Remaining Grassland	Wetlands Remaining Wetlands		Settlements Remaining Settlements
	Closed Forest	Open Forest	Perennials	Annuals		Flooded	Peatland	
Climate/Region	Tropical Wet							
Soil Type	High Activity Clay Mineral							
Aboveground Biomass in Forests	350	280	106	10				
Aboveground Biomass Growth in Plantation/Natural Forests	2.2	3.4						
Age Class	Unspecified							
Annual Carbon Stocks			25					
Annual Growth of Perennial Woody Biomass			2					
Area affected by Disturbances (ha)	300	500						
Area	2,000,000 ; 1500000	1,000,000:500,000	500,000	300,000	1000,000	20,000	35,000	80,000
Biomass Accumulation Rate			10					
Biomass Carbon Loss			50					
Biomass Conversion and Expansion Factor for Wood and Fuelwood Removal	1.67	1.44						
Biomass Stocks					16.1	20	50	0
Carbon Fraction of Dry Matter					0.47	0.47	0.5	0.47
Carbon Fraction of Air Dry Peat By Volume							10	
Continent Type	Unspecified							
CO_2 Emission Factor for							2	

Nutrient Rich Peat Soils								
Cropland Type			All Perennials					
Emission Factor for Drained Organic Soils in Managed Forests	1.36							
Emission Factor for Nutrient Poor Peat Soils							0.5	
Fraction of Biomass Lost in Disturbances	0.5	0.5						
FMG								1
Forest Land Data Ecosystem Type	Tropical rainforest							
Grassland Data: Vegetation Type					Tropical			
Growing stock level	81-120	121-200						
Harvest/Maturity cycle			5					
Input			0.92	0.92				1
Litter Carbon Stocks of Mature Forests	2.1	2.1						
Annual Wood Removal	10,000	20,000						
Annual Fuelwood Removals	2,000	5,000						
Management – Severely degraded					0.7			
N2O Emission Factor for Nutrient Rich Organic Soils							2.2	
Ratio of Belowground to Aboveground	0.37	0.37						
Species	Other broadleaf							
Reference Soil Organic Carbon	44	44	44	44	20			44
Relative Stock Change Factor – FLU			0.48	1.1	1			1
Tillage–Full				1				
Time Dependence of Stock Change Factors (D) or Number of Years Over a Single Inventory Time Period			20	20	20			
Wetland Data: Type					Flooded Land	Peatland		

Dr. Florencia B. Pulhin
Forestry Development Center
UPLB-CFNR

3. Data needed for AFOLU

Orientation Workshop on IPCC 2006 Guidelines and Software for Greenhouse Gas Inventories in the Agriculture, Forestry, and Other Land use (AFOLU) Sector

August 24-25, 2017 * Microtel by Wyndham, Commonwealth Avenue, Quezon City

Data needed in AFOLU

Subsector	Data	Availability	Source
Livestock	Population	Yes	PSA
	Manure Management	No	
Land	Soil Type	Yes?	
	Aboveground Biomass in Forests	Data available are based on old classification	UPLB/Academe
	Aboveground Biomass Growth in Plantation/Natural Forests/Perennial Woody Biomass	Yes	UPLB/Academe
	Area affected by Disturbances (ha)	No?	
	Biomass Accumulation Rate	Yes	UPLB/Academe
	Carbon Fraction of Dry Matter	Yes	UPLB/Academe
	Carbon Fraction of Air Dry Peat By Volume		
	CO_2 Emission Factor for Nutrient Rich Peat Soils		
	Fraction of Biomass Lost in Disturbances		
	Growing stock level	Yes	UPLB/Academe
	Harvest/Maturity cycle	Yes	UPLB/Academe
	Litter Carbon Stocks of Mature Forests	Yes	UPLB/Academe
	Annual Wood Removal	Yes	FAO Statistics/FMB
	Annual Fuelwood Removals	Yes	FAO Statistics/FMB
	Ratio of Belowground to Aboveground	Yes	UPLB/Academe
	Soil Organic Carbon	Yes	UPLB/Academe

Subsector	Data	Availability	Source
	Relative Stock Change Factor – FLU		
	Area burned in forests, grassland and cropland		
	Mass of Fuel Available for Combustion in forests, grassland and cropland		
	Annual Amount of Lime Used		
	Annual Amount of Urea Used		
	Annual Amount of Organic Amendment Applied		
	Wood Density	Yes	UPLB/Academe
	Landcover Change (recommended is 10 years)	Yes?	DENR (NAMRIA)

Dr. Florencia B. Pulhin
Forestry Development Center
UPLB-CFNR

4. Post-Training Evaluation Result (Tabulation)

	Strongly Agree 5	**Agree 4**	**Neutral 3**	**Disagree 2**	**Strongly Disagree 1**	**Total**	**Weighted Average**
PREPARATION AND COURSE DELIVERY							
Invitation stated the goals	6	7	1	0	0	14	1.36
WS content was organized & easy to follow.	3	10	1	0	0	14	1.14
Sufficient opportunity for interactive participation	4	9	1	0	0	14	1.21
Materials distributed were pertinent and pitched at the right level.	4	8	2	0	0	14	1.14
Sufficient time to cover all proposed activities	6	6	2	0	0	14	1.29
Average	***4.6***	***8***	***1.4***	0	0		
FACILITATOR/MODERATOR							
Proper Guidance from the Moderator	3	10	1	0	0	14	1.14
Facilitator(s) was/were well prepared for the workshop	4	9	1	0	0	14	1.21
Comprehensive and Clear instructions and directions	4	10	0	0	0	14	1.29
Facilitator(s) encouraged active participation and ownership to expected outputs	6	7	1	0	0	14	1.36
Average	***4.25***	***9***		0	0		
SPEAKERS: Clear, Concise and Effective Presentation							
Ms. Verena Schauss	8	6	0	0	0	14	1.57
Ms. Sandee Recabar	9	4	1	0	0	14	1.57
Dr. Florencia Pulhin	7	7	0	0	0	14	1.50
Average	***8.00***	***5.67***	***0.33333***				
GENERAL SATISFACTION							
Objectives were met	5	9	0	0	0	14	1.36
Learned a lot of new concepts and tools	7	7	0	0	0	14	1.50
Satisfied with my increased understanding of the topic	5	9	0	0	0	14	1.36
Definitely help me make a difference in the way I do my job	4	5	5	0	0	14	0.93
Sharing of information with other colleagues	9	4	1	0	0	14	1.57
Average	**6**	**6.8**	**1.2**	0	0		
FACILITY							
Training venue and related facilities provided a comfortable setting.	5	8	0	1	0	14	1.21
Location for the training was accessible and convenient for me.	5	8	1	0	0	14	1.29
Refreshments and food provided were of good quality.	7	5	1	1	0	14	1.29
Tools and equipment during the sessions worked well.	4	8	2	0	0	14	1.14
Average	***5.25***	***7.25***	***1***	***1***	***0***		

Bonn and Eschborn, Germany
T +49 228 44 60-0 (Bonn)
T +49 61 96 79-0 (Eschborn)

Friedrich-Ebert-Allee 40
53113 Bonn, Germany
T +49 228 44 60-0
F +49 228 44 60-17 66

Dag-Hammarskjöld-Weg 1-5
65760 Eschborn, Germany
T +49 61 96 79-0
F +49 61 96 79-11 15

E info@giz.de
I www.giz.de