



Proceedings of the training on greenhouse gas inventory for Land Use, Land-Use Change and Forestry (LULUCF)



Bangladesh Forest Department
09 – 10 October 2016

UN-REDD
PROGRAMME



Food and Agriculture
Organization of the
United Nations



UN
environment

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The UN-REDD Bangladesh National Program is implemented by the Bangladesh Forest Department under the leadership of Ministry of Environment and Forests. United Nations Development Program (UNDP) and Food and Agriculture Organization (FAO) are the two implementing partners.

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EXECUTIVE SUMMARY

The FAO Representation Office in Dhaka organised a two-day training on the estimation of emissions and removals of greenhouse gases derived from the Land use, land-use change and forestry sector. The training was held on 9 and 10 October 2016 at the Bangladesh Bureau of Statistics in Dhaka. The training included presentations, practical exercises and discussions with the participants.

In total, ten participants (eight male and two female) attended the training. The participants were from the Forest Department, Sylhet Forest Division, Dhaka Forest Division, Tangail Forest Division, Bangladesh Bureau of Statistics, Bangladesh Forest Research Institute, Department of Environment, Khulna University, Soil Resource Development Institute and Space Research and Remote Sensing Organization.

The objective of the training was to familiarise the participants with the assessment of carbon stock changes from land use remaining in the same land use category (e.g. forest land remaining forest land) as well as land converted to different land use (e.g. forest land converted to cropland). The participants followed Tier 1 methodology described in the IPCC 2006 Guidelines. The land area data were obtained from the Global Land Cover Map for the year 2005 and 2009 and default emission factors obtained from IPCC 2006 Guidelines were used.

At the end of the training workshop an evaluation survey was conducted which highlighted a high level of satisfaction from the participants. The use of practical exercises was particularly appreciated, as well as the presentations and content of the course. During group discussion participants recognised the need of improving data availability at a national level.

CONTENTS

Executive Summary	3
Contents.....	4
1. Introduction	5
2. Objectives.....	5
3. Summary of the training	5
3.1 GHG inventory compilation for Bangladesh for the year 2005-2009 using Tier 1.....	6
4. Recommendations for next steps	6
5. Reference	8
Appendix 1. Agenda	9
Appendix 2. Participant List.....	10
Appendix 3. Evaluation.....	11
Appendix 4. Supplementary Material	14

1. INTRODUCTION

Understanding the greenhouse gases (GHGs) emission trend is critically important to assess the national and international community's collective and individual determinations to address climate change. In view of this circumstance, a complete and transparent GHG inventory preparation by each country is essential to meet the ultimate objective of the framework convention on climate change (UNFCCC).

Bangladesh is in the process of submitting the Third National Communication to the UNFCCC for the time period 2006 to 2012. However, the preparation of a GHG inventory for the LULUCF sector is difficult due to the lack, unreliability and unsuitability of activity data and emission factors.

The FAO Representative (FAOR) in Bangladesh will support the Government of Bangladesh to prepare the TNC and REDD+ activities by establishing necessary REDD+ management processes, identifying strategic readiness options for completing its National REDD+ strategy, and developing the capacities required to begin implementation of REDD+. Bangladesh will also develop a National Forest Monitoring System (NFMS), which will enable the country to prepare a Greenhouse Gas Inventory for LULUCF. To support these REDD+ activities, a series of trainings that provide both the theoretical background and practical exercises on estimation of GHGs on LULUCF took place in Bangladesh.

2. OBJECTIVES

The objectives of the training was to

1. Familiarise participants with the IPCC 2006 Guidelines and the reporting tables;
2. Train participants in GHG inventory compilation and;
3. Train participants to estimate emissions and removals of greenhouse gases from land category remaining in the same land category as well as land converted to different land category using land use change matrix.

3. SUMMARY OF THE TRAINING

The workshop took place on the 9th and 10th of October, at the Bangladesh Bureau of Statistics (BBS), in Dhaka. The workshop was attended by 10 experts (of which 2 were women), from the Bangladesh forest department, national universities and other technical national institutions. The complete list of participants is in Appendix 2. Together with the reporting consultant, the workshop was facilitated by Anatoli Poultouchidou and K. M. Nazmul Islam, consultants on GHG inventory for the UN-REDD National Programme in Bangladesh. The training focused on the methodology for preparing annual greenhouse gas inventories for land use, land use changes and the forestry sector based on the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Time was mainly allocated to practical exercises, in which participants could directly apply the IPCC guidance and calculation procedures. The agenda of the workshop is available in Appendix 1.

3.1 GHG inventory compilation for Bangladesh for the year 2005-2009 using Tier 1

The practical exercise consisted in compiling a full GHG inventory for the period 2005-2009 based on global land use data and IPCC default values. Activity data were obtained combining three different maps:

- 1) Global land cover for 2005 and 2009 developed by the GlobCover project (http://due.esrin.esa.int/page_globcover.php). These products are generated using as input observations from the 300m MERIS sensor on board the ENVISAT satellite mission and are freely available on the ESA website.
- 2) HWSD soil database (FAO/IIASA/ISRIC/ISS-CAS/JRC, 2009). This product is a 30 arc-second raster database with over 15 000 different soil mapping units that combines existing regional and national updates of soil information worldwide with the information contained within the 1:5 000 000 scale FAO-UNESCO Soil Map of the World .
- 3) Global ecological zone (FAO, 2012)

The land use change matrix generated based on the GlobCover maps is presented in Appendix 4. Notice that these estimates have been generated only for the purpose of the exercise, since it is never recommendable to estimate land use changes by comparing **two maps and are not suitable to be used for the compilation the national GHG inventory to be submitted to the UNFCCC.**

The default emission factor obtained from IPCC 2006 Guidelines were used in the exercise.

4. RECOMMENDATIONS FOR NEXT STEPS

The workshop contributed to reinforce national capacities and knowledge on GHG inventory for the LULUCF sector. Group discussions and practical exercises led to the identification of needs and gaps in data collection. A list of possible activities related to data collection which could prove helpful to for the GHG inventory compilation has been compiled. The activities are, as follows:

Wood removals

- Check for completeness the information on wood production (fuel wood and round wood) published on FAOSTAT with the national source of data for the FAO. And check whether the volume provided is over or under-bark.
- Identify, if possible, wood's provenance by ecological zone and IPCC category.
- screening of regional surveys or local studies on fuel wood consumption, to supplement the information on fuel wood removal

Biomass Growth rate

- Repeated measurements have been carried out for some forest areas in the country (data should be available in the new FAO harmonized database), from which volume increment or (biomass growth rate) could be derived.

Management practices

- Obtain information about major cropland types and management practices (if spatially explicit data are not available, approach 1 can be used). Information to be collected include:
 - the type of residue management
 - Tillage management
 - fertilizer management (both mineral fertilizers and organic amendments),
 - choice of crop and intensity of cropping management (e.g., continuous cropping versus cropping rotations with periods of bare fallow)
 - irrigation management
 - Areas of woody perennial crop that is harvested/removed every year and area of perennial wood crop under growth.
- Collect specific information about rice cultivation:
 - Regional differences in rice cropping practices (e.g. flooding patterns, etc.)
 - Multiple crops (e.g. if more than one crop is harvested on a given area of land during the year)
 - Water regime (i.e., irrigated, rainfed, or deep water rice production)
 - Organic amendments to soils

Data on forest disturbances

- screening of available data source on disturbances. Check the info provided on FRA 20015 for completeness.
- A study on the damages caused by the most recent cyclone?
- Collect data on forest fires

Soil

- Screening of all national sources on soil
- Collect, if possible, activity data on drained organic soils

Biomass burning:

Collect data on biomass burning for all major categories of crop residues

5. REFERENCE

FAO. (2012). *Global ecological zones for FAO forest reporting: 2010 Update, Forest Resources Assessment Working Paper 179*. Retrieved from Rome:
<http://www.fao.org/docrep/017/ap861e/ap861e00.pdf>

FAO/IIASA/ISRIC/ISS-CAS/JRC. (2009). *Harmonized World Soil Database (version 1.1)*. Retrieved from FAO, Rome, Italy and IIASA, Laxenburg, Austria:

APPENDIX 1. AGENDA

Date	Session	Resource person
9 October 2016		
Morning	Presentation of the content and objectives of the training	Mariam Akhter
	Land representation of Bangladesh by climate, soil, eco type	Anatoli Poultouchidou/ Nazmul Islam
	Approach 1,2,3 for preparing the AD on land areas	Luca Birigazzi
	Collection, compilation and archiving of emission factors data Presentation on SOC values obtained from the analysis based on data from the HWSO Collection, compilation and archiving of activity data	Anatoli Poultouchidou/ Nazmul Islam
Afternoon	Practical exercise on the estimation of GHG emissions for the LULUCF sectors for the years 2005 and 2010 using common reporting format tables of IPCC GPG 2003	Luca Birigazzi/ Anatoli Poultouchidou/ Nazmul Islam
10 October 2016		
Morning	QA/QC of the GHG Inventory for the LULUCF sector	Luca Birigazzi
	Uncertainty analysis for the LULUCF"	Luca Birigazzi
	Key category analysis	Luca Birigazzi
Afternoon	Practical exercise on the estimation of GHG emissions for the LULUCF sectors for the years 2005 and 2010 using common reporting format tables of IPCC 2006.	Luca Birigazzi
	Comparison of estimation on GHG obtained from IPCC GPG 2003 and IPCC 2006	

APPENDIX 2. PARTICIPANT LIST

No.	Name	Gender	Organization	Designation
1	Abdullah –al-Mamun	M	Sylhet Forest Division	ACF
2	Dr. Mohammad Abu Sayed Arfin Khan	M	Sylhet Forest Division	Assist. Professor
3	Sharmin Akther	F	Dhaka Forest Division	ACF
4	Abu Yousuf	M	Tangail Forest Division	ACF
5	Md. Azgar Ali	M	BBS	Statistical Officer
6	Md. Bablu Zzaman	M	Forest Department	Forester
7	Md. Motiar Rahman	M	BFRI	Special Research Officer
8	Md. Mozahidur Rahman	M	DoE	Assistant Director
9	Dr. Md Golan Rakkibu	M	Khulna University	Professor
10	Neelima Akter Kohinoor	F	SRDI	
11	Dr. Md. Abdussalam	M	SPARRSO	Principal Scientific Officer
12	Luca Birrigazzi	M	FAO	Intern. GHG Consultant
13	K.M. Nazmul Islam	M	FAO	National GHG Consultant
14	Frida Sidik	F	FAO	Soil Scientist
15	Mariam Akhter	F	FAO	
16	Anatoli Poultouchidou	F	FAO	Intern. GHG Consultant

APPENDIX 3. EVALUATION

How often do you participate in training related to forest monitoring?		
First time	6	60%
1-3 every year	3	30%
More than 3 per year	0	0%
Regularly (approximately one per month)	1	10%
I would describe my self as?		
A professor/academic	2	20%
A student	0	0%
Forest Department staff	3	30%
Government staff (outside Forest Department)	5	50%
NGO staff	0	0%
Private consultant	0	0%
Other	0	0%
My professional background relates most closely to:		
Forester	6	60%
GIS/RS	2	20%
Statistics	1	10%
Social survey/assessment	1	10%
Economics	0	0%
Natural Resource Management	4	40%
Ecology	3	30%
other	1	10%
My years of relevant experience is:		
1-2 years	2	20%
3-5 years	1	10%
5-7 years	1	10%
8-10 years	1	10%
More than 10 years	5	50%
The training was relevant to my daily work		
Strongly agree	3	30%
Agree	6	60%
Neutral	0	0%
Disagree	1	10%
Strongly disagree	0	0%
I had enough previous knowledge to understand the content of the event		
Strongly agree	1	10%

Agree	6	60%
Neutral	2	20%
Disagree	1	10%
Strongly disagree	0	0%
The training met my expectations in terms of the content and learning outcomes		
Strongly agree	1	10%
Agree	8	80%
Neutral	1	10%
Disagree	0	0%
Strongly disagree	0	0%
The learning resources provided were adequate and useful		
Strongly agree	2	20%
Agree	8	80%
Neutral	0	0%
Disagree	0	0%
Strongly disagree	0	0%
The resource person presented information in a way that i could understand and was easy to follow		
Strongly agree	3	30%
Agree	7	70%
Neutral	0	0%
Disagree	0	0%
Strongly disagree	0	0%
I feel confident to be able to carry out the tasks described in the training without supervision.		
Strongly agree	1	10%
Agree	6	60%
Neutral	2	20%
Disagree	1	10%
Strongly disagree	0	0%
I was pleased with the venue/meeting room/snacks etc		
Strongly agree	5	50%
Agree	5	50%
Neutral	0	0%
Disagree	0	0%
Strongly disagree	0	0%
Are there other people/agencies/organisations that you think should have been included in the training?		
Department of Agricultural Extension (DAE)		
Personnel of Department of Agricultural Extension and BBS can be added		
Department of Land		
BBS		

Any other comments?		
Data availability and reliability is poor. It has been informed the the preparation of data is going on, so I am hopeful that after the availability of the data the results of the exercises will certainly be improved. Thank you!		
Trainee should be given home assignments and report to presenter through email to check whether they can do the similar work by themselves without assistance.		
Duration of this training can be increased for better understanding of trainees specially who are not directly related to forest department.		
I think it is a very needful training. I would like to express my gratitude to the organizer.		
Please keep it up		

APPENDIX 4. SUPPLEMENTARY MATERIAL

		Land cover 2005						Total
		Cropland	Forest land	Grass land	Other land	Settlements	Wetland	
		Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	Area (ha)	
Land cover 2009	Cropland	9617126.5	647990.0	103.5	433.9	438.3	13725.0	1027981 7.16
	Forest land	97888.1	2910322.4	198.6	771.4	912.0	21039.4	3031131 .78
	Grass land	0.0	0.0	3168.6			0.0	3168.64
	Other land	4407.3	22121.0		12932.4	8.7	469.2	39938.6 0
	Settlements	0.0	0.0			94857.3	0.0	94857.2 7
	Wetland	0.1	0.1	0.0	0.0	0.0	457719.7	457719. 88
	Total	9719421.9	3580433.5	3470.7	14137.7	96216.3	492953.2	1390663 3.33

Notice that these estimates have been generated only for the purpose of the exercise, since it is never recommendable to estimate land use changes by comparing two maps and are not suitable to be used for the compilation the national GHG inventory to be submitted to the UNFCCC.