Greenhouse gas inventory training for land use, land-use change and forestry

Bangladesh Forest Department

07 – 12 June 2015

UN-REDD PROGRAMME

Food and Agriculture Organization of the United Nations

UNDP

UN environment

The UN-REDD Programme, implemented by FAO, UNDP and UNEP, has two components: (i) assisting developing countries prepare and implement national REDD strategies and mechanisms; (ii) supporting the development of normative solutions and standardized approaches based on sound science for a REDD instrument linked with the UNFCCC. The programme helps empower countries to manage their REDD processes and will facilitate access to financial and technical assistance tailored to the specific needs of the countries.

The application of UNDP, UNEP and FAO rights-based and participatory approaches will also help ensure the rights of indigenous and forest-dwelling people are protected and the active involvement of local communities and relevant stakeholders and institutions in the design and implementation of REDD plans.

The programme is implemented through the UN Joint Programmes modalities, enabling rapid initiation of programme implementation and channeling of funds for REDD efforts, building on the in-country presence of UN agencies as a crucial support structure for countries. The UN-REDD Programme encourage coordinated and collaborative UN support to countries, thus maximizing efficiencies and effectiveness of the organizations' collective input, consistent with the "One UN" approach advocated by UN members.

Contacts:

Rakibul Hassan Mukul
Project Director
UN-REDD Bangladesh National Programme
Bangladesh Forest Department
Email: pd-unredd@bforest.gov.bd

Matieu Henry
UN-REDD Programme
Food & Agriculture Organization of the United Nations (FAO)
Email: Matieu.Henry@fao.org

Sugested Citation: **Akhter, M.** 2015. Greenhouse Gas Inventory training for Land Use, Land-Use Change and Forestry. 7 – 12 June 2015. Dhaka, Bangladesh Forest Department, Food and Agricultural Organization of the United Nations.

Disclaimer

This report is designed to reflect the activities and progress related to UNJP/BGD/057/UNJ UN-REDD Bangladesh National Programme. It does not reflect the official position of the supporting international agencies including FAO and UNDP should not be used for official purposes. Should readers find any errors in the document or would like to provide comments for improving the quality they are encouraged to contact one of above contacts.

Contents

1. Executive summary 4

2. Introduction 5

3. Summary of presentations and exercises 5

2.1. Introduction to the GHG Inventory 6
2.2. GHG Inventory methodologies 6
2.3. Institutional arrangements 7
2.4. Land representation 8
2.5. Soil 8
2.6. Forest Degradation 9
2.7. Deforestation 10
2.8. Key category analysis 10

4. Recommendations for next steps 10

Appendix 1 12

Appendix 2 15

Appendix 3 18

1. Executive summary

FAO Bangladesh organized a training course on "Greenhouse Gas inventory for the LULUCF Sector" held at Bangladesh Forest Department, Dhaka under the Targeted Support Activity of UN-REDD programme during 07-11 June 2015 with the collaboration of Bangladesh Forest Department. Participants from the Forest Department (FD), Department of Environment (DoE), Bangladesh Forest Research Institute (BFRI), Department of Land Records and Survey (DLRS), Survey of Bangladesh (SoB), Space Research and Remote Sensing Organization (SPARRSO), Soil Research Development Institute (SRDI), Bangladesh Bureau of Statistics (BBS) and the participants from forestry discipline of Chittagong University, Shahjalal University, and Khulna University joined at the training.

The training focused on the capacity building related to estimation/calculation of GHG for the LULUCF sector as IPCC guideline of 2003, institutional arrangements relevant to the preparation of the national communications, reporting requirements for REDD+, National Forest Monitoring System & IPCC Guidelines which are critical elements of the UN-REDD Programme.

The training workshop provided numerous technical presentations on reporting requirements on GHG under UNFCCC, Importance of Institutional arrangement, approaches for land representation, land stratification, land use database, emission and removal of soil, carbon pools in forests and estimation methods, key category analysis etc. Participants practiced the respective exercises using the IPCC guideline of 2003.

Preparation of Third National Communication (TNC) for the period of 2009 to 2011 has been started under a project of Department of Environment of Ministry of Environment and Forest. This training has covered the topic and exercises for the estimation of GHGs for the LULUCF sector which would help the stakeholder departments for the coordination and preparation of their report.

2. Introduction

Bangladesh is one of the most vulnerable countries worldwide to the negative impacts of climate change and needs to develop its institutional competence to play a full role in international negotiations on climate change and in developing new mechanisms aimed at climate change adaptation and mitigation. The role of forests has expanded from production of timber and fuel wood to include a range of environmental services including mitigation of the impacts of climate change. There is increasing awareness of the role of forests in sustaining livelihoods and economic development and the institutions face new demands in ensuring forests increase their contribution to these goals.

"Climate change, environment and disaster risk reduction and response" is one of the seven pillars of the United Nations Development Assistance Framework (UNDAF) for Bangladesh (2012 to 2016) that would promote a balanced approach to ensure that key climate change, disaster risk reduction and environmental issues are anchored in national plans and strategies, and that greater awareness is created on environment, climate and social sustainability issues.

Forest resources in Bangladesh play an important role in country's physical and socio-economic development and maintenance of environmental balance and sustainable land-based production system. The total area of forest land is 2.53 million hectares representing about 17.1 percent of the country's area. Bangladesh Forest Department manages 1.53 million hectares of forest land.

Bangladesh is preparing the third communication to the UNFCCC and the preparation of the GHG inventory for LULUCF is particularly complex in term of accessibility and robustness of activity data and emission factors. Several land cover maps exist but the land representation is not consistent over time. In addition, there is no database for the emission factors or the emission factors are not linked with the activity data used for reporting particularly taking into consideration the data produced during the National Forest Assessment 2005-2007. Strengthening the national capacities toward the acquisition of more transparent, documented and applicable activity data and emission factors is crucial to ensure the GHG inventory and the Reference Levels and Forest monitoring system for REDD+ are consistent over time.

In order to support national capacities in the preparation of GHG inventory for LULUCF sector, the UN-REDD, through its targeted support has supported training between June 7 and 11th 2015 at the Korobi Conference Room, Ban Bhaban, Agargaon, Dhaka. The objectives of the training were (1) to support knowledge exchange and transfer between national staff on GHG inventory for the LULUCF sector, (2) to develop understanding of Activity Data (AD) and Emission Factor (EF) and their integration for GHG inventory for LULUCF, (3) familiarization with IPCC Guidelines and software, and (4) to enable participants to produce country GHG emission for the LULUCF sector.

3. Summary of presentations and exercises

The five day's training workshop was undertaken following the agenda presented in Appendix 1. In total 25 participants (20 male, 5 female) from various national institutions were present (**Error! Reference source not found.**). The welcome remarks were given by Mr. Md. Yunus Ali,

Chief Conservator of Forests, Forest Department, Mr. Mike Robson, FAO Representative in Bangladesh, Mr. Karl Wurster, Deputy Director, Economic Growth Office, USAID and Md. Mozaharul Islam, Conservator of Forests, UN-REDD Focal Point in Bangladesh. The training was organized in 8 sessions (modules) as follow (1) Introduction to the GHG Inventory, (2) GHG Inventory methodologies, (3) Institutional arrangements, (4) Land representation, (5) Soil, (6) Forest Degradation, (7) Deforestation and (8) Key category analysis. The training included theorical courses and practical exercises. Below is a brief description of the content of each session and module.

2.1. Introduction to the GHG Inventory

A complete and transparent GHG inventory is essential for understanding emission trends and assessing the international community's collective and individual efforts to address climate change and meet the ultimate objective of the Framework Convention on Climate Change (UNFCCC). GHG inventories can be used to evaluate mitigation options, assess the effectiveness of policies and measures, make long term emissions projections, provide the foundation of emission trading schemes and identify sectors for cost-effective emission reduction opportunities. When reporting to international conventions and participating to voluntary performance-based mechanisms like REDD+, the consistency of the provided information is a key principle.

Non-Annex I countries parties are requested to use the Revised 1996 IPCC Guidelines and are recommended to use the IPCC GPG-LULUCF 2003 for the preparation of their Greenhouse Gas Inventory. The IPCC provides worksheets for the preparation of the GHG inventory, in which activity data and emission factors are being compiled to make the calculations. Basically two methods are proposed to assess carbon stock and stock changes for the LULUCF sector: the stock difference and the gain loss methods. Different approaches are proposed to represent land categories. Countries can use whether tier 1, 2 or 3 values and methods to prepare their GHG inventory. A combination of methods, approaches and tiers can be used depending on resources and data available. Tools such as quality control and key category analysis allows to improving the preparation of the inventory in term of quality and priority. According to the Cancun agreements, countries are requested to prepare Biennial Update Report by December 2014 which includes a national inventory report, and national communications every four years.

The exercise focused on preparing a business as usual scenario for a one million hectare forest land area that is being converted at a rate of 1000 hectare per year to oil palm plantation. The participants calculated the impact of land use change on emissions and removals and, compared two scenario through eucalyptus and rubber plantations.

2.2. GHG Inventory methodologies

The IPCC principles are crucial for the preparation of GHG inventory for LULUCF. Through the national GHG inventory, Parties will quantitatively demonstrate the extent to which LULUCF activities affect their emission reduction commitments. Building on the principles established in the UNFCCC reporting guidelines for biennial GHG inventories, an ideal GHG inventory

possesses the following core principles: transparency, consistency, comparability, completeness, and accuracy.

Transparency

Transparency means that the data sources, assumptions and methodologies used for an inventory should be clearly explained, in order to facilitate the replication and assessment of the inventory by users of the reported information. The transparency of inventories is fundamental to the success of the process for the communication and consideration of the information.

Consistency

Consistency means that an inventory should be internally consistent in all its elements with inventories of other years. An inventory is consistent if the same methodologies are used for the base and all subsequent years and if consistent data sets are used to estimate emissions or removals from sources or sinks. Under certain circumstances, an inventory using different methodologies for different years can be considered to be consistent if it has been recalculated in a transparent manner, in accordance with the Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.

Comparability

Comparability means that estimates of emissions and removals reported Parties in inventories should be comparable. For this purpose, Parties should use the methodologies and formats agreed by the COP for estimating and reporting inventories.

Completeness

Completeness means full geographic coverage of sources and sinks.

Accuracy

Accuracy is a relative measure of the exactness of an emission or removal estimate. Estimates should be accurate in the sense that they are systematically neither over nor under true emissions or removals, as far as can be judged, and that uncertainties are reduced as far as practicable. Appropriate methodologies should be used, in accordance with the IPCC Good Practice Guidance, to promote accuracy in inventories.

The exercise focused on the use of the IPCC Good Practice Guidance for LULUCF 2003 and in particular on the identification of specific information in the various chapters and appendix.

2.3. Institutional arrangements

Institutional arrangements are crucial for (1) helping each Party meet reporting requirements by ensuring that the GHG inventory is prepared in accordance with the relevant COP decisions (e.g., 17/CP.8), (2) to ensure continuity through the development of national capacities and capabilities, (3) to ensure the sustainability of the GHG preparation process, (4) to inform international, national and local policy making, (5) to foster consistent estimation approaches across government agencies and offices, (6) to coordinate responses to requests for information, and (7) to ensure high quality and objective inventory information.

The exercise focused on the preparation of institutional arrangements for the planning, preparation and management of the GHG inventory for the LULUCF sector in particular. Several groups presented different options for institutional arrangements (Appendix 3).

2.4. Land representation

Chapter 2 of the GPG 2003 provides indication for the representation of land areas. Information about land area is needed to estimate carbon stocks and emissions and removals of greenhouse gases associated with Land Use, Land-Use Change and Forestry (LULUCF) activities. This chapter seeks to provide guidance on the selection of suitable methods for identifying and representing land areas as consistently as possible in inventory calculations. In practice, countries use methods including annual census, periodic surveys and remote sensing to obtain area data. Starting from this position, Chapter 2 provides good practice guidance on three approaches for representing land area. The approaches are intended to provide the area data specified in Chapters 3 and 4 for estimating and reporting greenhouse gas inventories for different categories of land. The approaches are also intended to make the best use of available data and models, and to reduce, as far as practicable, possible overlaps and omissions in reporting land areas. The approaches described here should minimize the chance that some areas of land appear under more than one activity whilst others are overlooked. The approaches and guidance presented here allow informed decisions on these matters to be made by those preparing greenhouse gas inventories but are not intended to be definitive or exhaustive. Good practice approaches for representing areas should have the following general characteristics: (1) adequate, (2) consistent, (3) complete and (4) transparent.

The proposed following six broad categories of land are: Forest Land, Cropland, Wetlands, Settlements, Grassland and Other Lands. The categories are broad enough to classify all land areas in most countries and to accommodate differences in national classification systems. These national classification systems should be used consistently over time. The categories are intended for use in conjunction with the approaches described in subsequent sections of this chapter to facilitate consistent estimation of land use over time.

The exercise focused on the preparation of land area and area changes using approach 1, 2 and 3 and assessing the accuracy of an approach 2 or 3 when ground data are available.

2.5. Soil

Soil organic carbon represents 2/3 of the terrestrial carbon. Although both organic and inorganic forms of C are found in soils, land use and management typically has a larger impact on organic C stocks. Consequently, the methods provided in these guidelines focus mostly on soil organic C. Overall, the influence of land use and management on soil organic C is dramatically different in a mineral versus an organic soil type. Organic (e.g., peat and muck) soils have a minimum of 12 to 20 percent organic matter by mass, and develop under poorly drained conditions of wetlands. All other soils are classified as mineral soil types, and typically have relatively low amounts of organic matter, occurring under moderate to well drained conditions, and predominate in most ecosystems except wetlands. Discussion about land-use and management influences on these contrasting soil types is provided in the next two sections.

Mineral soils are a carbon pool that is influenced by land-use and management activities. Land

use can have a large effect on the size of this pool through activities such as conversion of native Grassland and Forest Land to Cropland. Within a land-use type, a variety of management practices can also have a significant impact on soil organic C storage, particularly in Cropland and Grassland.

For organic soils, inputs of organic matter can exceed decomposition losses under anaerobic conditions, which are common in undrained organic soils, and considerable amounts of organic matter can accumulate over time. The carbon dynamics of these soils are closely linked to the hydrological conditions, including available moisture, depth of the water table, and reduction-oxidation conditions. Drainage is a practice used in agriculture and forestry to improve site conditions for plant growth. Loss rates vary by climate, with drainage under warmer conditions leading to faster decomposition rates. Losses of CO2 are also influenced by drainage depth; liming; the fertility and consistency of the organic substrate; and temperature. Soil C inventories include estimates of soil organic C stock changes for mineral soils and CO2 emissions from organic soils due to enhanced microbial decomposition caused by drainage and associated management activity. In addition, inventories can address C stock changes for soil inorganic C pools (e.g., calcareous grasslands that become acidified over time) if sufficient information is available to use a Tier 3 approach.

The exercise focused on assessing soil organic carbon stocks and stock changes using approach 1 and 2 for land representation.

2.6. Forest Degradation

The chapter 3 of the GPG 2003 provides indications methods for estimating carbon stock changes and greenhouse gas emissions and removals associated with changes in biomass and soil organic carbon on forest lands and lands converted to forest land. It is consistent with the approach in the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (IPCC Guidelines) whereby the annual change in biomass is calculated from the difference between biomass growth and loss terms. The Guidance: (1) Addresses the five carbon pools; (2) Links biomass and soil carbon pools for the same land areas at the higher tiers; (3) Includes emissions of carbon on managed lands due to natural losses caused by fire, windstorms, pest and disease outbreaks; (4) Provides methods to estimate non-CO2 greenhouse gas emissions; and (5) Should be used together with the approaches for obtaining consistent area data.

The section 3.2.1.concerns forest land remaining forest land and provides guidance for estimation of changes in carbon stock from five carbon pools (i.e. aboveground biomass, belowground biomass, dead wood, litter, and soil organic matter), as well as emissions of non-CO2 gases from such pools.

The exercise focused on assessing forest carbon stock and stock changes, emissions and removals, using stock difference and gain-loss methods for forest remaining as forest land.

2.7. Deforestation

Assessment of deforestation is being performed using the information in the various sections of chapter 3. In particular, the assessment of the stock change from the conversion from forest to cropland is achieved following the indications provided in the section 3.3.2. (land converted to cropland).

The exercise focused on assessing emissions from forest land converted to grassland and cropland.

2.8. Key category analysis

The fifth chapter of the IPCC GPG LULUCF 2003addresses several issues including the key category analysis. Generally, inventory uncertainty is lower when emissions and removals are estimated using a higher tier. However, these generally require extensive resources for data collection, so it may not be feasible to use higher tier methods for every category of emissions and removals. It is therefore good practice to make the most efficient use of available resources by identifying those categories that have the greatest contribution to overall inventory uncertainty. By identifying these key categories in the national inventory, inventory agencies can prioritize their efforts and improve their overall estimates. It is good practice for each inventory agency to identify its national key categories in a systematic and objective manner. Such a process will lead to improved inventory quality, as well as greater confidence in the emission estimates that are developed.

The exercise focused on assessing the key categories using a quantitative approach based on level assessment with and without LULUCF.

4. Recommendations for next steps

Data accessibility is one of the main problems related to the preparation of the GHG inventory for all sector, but in particular for the LULUCF sector. The preparation of the inventory for LULUCF sector is particularly complex because it integrates various sources of information and data from different institutions producing data for different objectives, at different time intervals and different means and methods. In consequence, significant efforts should be undertaken to harmonize the data and prepare them for the GHG inventory.

Data accessibility is not sufficient, applicability, robustness and documentation of the data is crucial. In order to support the preparation of the GHG inventory, the main priority is to support the collection of national specific activity data and emission factors, and to integrate them within one database. Particular attention should be given to the data collection for activity data and for the harmonization of land cover maps in order to obtain a matrix of land cover change for approach 2 or 3 of the IPCC.

In addition to the data collection process, national capacities can be strengthened in various topics including data collection, quality control, biomass burning, agriculture, accuracy assessment. The process for the preparation of the third national communication should be supported as far as possible.

Appendix 1

Agenda

Date	Programme	Resource person
Sunday June 7th		
Opening Session		
08:30	Registration of the participants	
10:00	Opening of the workshop (Welcome Address)	Mr Yunus Ali (CCF) Mr Mozaharul Islam (UN-REDD focal point) Mr Mike Robson (FAO Representative) Mr Karl Wurster (Deputy Director Economic Growth)
10:30	Introduction of participants	
11:00	Presentation of the contents and objectives of the training	Matieu Henry Forestry Officer -FAO
Session 1 : Introduction to the GHG Inventory		
11:30	GHG, climate change and Reporting Requirements under UNFCCC	Matieu Henry Forestry Officer -FAO
13:30	lunch Break	
14:30	Exercise – Importance of GHG inventory	Individual or by group
17:00	End of the day	
Monday June 8th		
Session 2 : GHG Inventory methodologies		
09:00	Presentation on GHG Inventory methodologies Revised IPCC GL 1996, GPG 2000, GPG-LULUCF 2003 and IPCC 2006	Matieu Henry Forestry Officer -FAO
11:00	Exercise - IPCC Guidelines and Good Practices	Individual or by group
13:30	Lunch Break	

14:00	Exercise - IPCC Guidelines and Good Practices	Individual or by group
Session 3 : Institutional arrangements		
16:00	Exercise – National System for GHG inventory and preparation of BURs	By group
17:00	End of the day	
Tuesday June 9th		
09:00	Institutional arrangements for GHG inventory	Henry Matieu Forestry Officer-FAO
Session 4 : Land representation		
10:00	Land representation	
11:00	Exercise- assessing land use change using different approaches	Individual or by group
12:30	lunch Break	
Session 5: Soil		
14:00	Soil	Matieu Henry
15:00	Exercise: soil organic carbon	Individual or by group
17:00	End of the day	
Wednesday June 10th		
Session 6: Forest Degradation		
09:00	Forest remaining as forest land	Matieu Henry Forestry Officer -FAO
10:00	Coffee break	
10:30	Practical training session Forest degradation	Individual or by group
12:30	lunch Break	
16:30	End of the day	
Thursday June 11th		
Session 7: Deforestation		
09:00	Deforestation	Matieu Henry Forestry Officer -FAO
	Practical training session	Individual or by group

10:00	Deforestation	
12:00	Preparation of the National Communication in Bangladesh	Ms. Wahida Musarrat Anita
13:00	Lunch break	
Session 8: Key category analysis		
14:00	Key Category Analysis	Matieu Henry Forestry Officer -FAO
15:00	Practical training session Key Category Analysis	Individual or by group
16:00	Diploma, closing ceremony	
17:00	End of the day	

Appendix 2

List of participants

Sl. No	Name of the participant, Designation and Organization	Contacts
1	Mr. Mohammad Golam Kibria, Assistant Professor Department of Forestry and Environmental Science, Shahjalal University of Science and Technology, Sylhet	kibria_sust29@yahoo.com
2	Mr. Mia Mahmudul Hoque, Senior Chemist DoE, Munshigang Office, Department of Environment	munshiganj@doe.gov.bd
3	Mr. Md. Arefin Badol Assistant Director DoE, Chandpur Office, Department of Environment	badalarefin@gmail.com
4	Mr. Mohammad Abdul Kadir Miah, Joint Director, Bangladesh Bureau of Statistics (BBS)	makm_fyff@yahoo.com
5	Ms. Raihana Siddiqui, Deputy Conservator of Forests, RIMS Unit, Forest Department	dcf.rims@gamil.com
6	Mr. Rakibul Hassan Mukul Assistant Chief Conservator of Forests, Establishment Unit, Forest Department	lalpiprey@gmail.com
7	Ms. Fatima Tuz Zohora Deputy Conservator of Forests, Legal Unit, Forest Department	fatima26bd@yahoo.com
8	Mr. A.S.M. Jahir Uddin Akon Deputy Conservator of Forests, Education and Training Wing, Forest Department	jahirakon@ymail.com

9	Md. Jakirul Karim Assistant Director, Survey of Bangladesh	bipul29@yahoo.com
10	Dr. Md. Taiabur Rahman Principal Scientific Officer, Soil Research Development Institute (SRDI)	mtrahman63@gmail.com
11	Mr. M.M.Abdullah-Al-Mamun Lecturer, Institute of Forestry and Environmental Science (IFESCU), Chittagong University	mamun@cu.ac.bd
12	Mr. Nasim Aziz Senior Programme officer, IUCN	nasim.aziz@iucn.org
13	Mr. Nasir-ud-Doula Charge Officer Land Record and Survey Department	nasir6318@gmail.com
14	Wahida Musarrat Anita Senior Assistant Secretary, Ministry of Environment and Forest Secretariat, Bangladesh	anita_musarrat@hotmail.com
15	Dr. Md. Golam Rakkibu Professor Forestry and Wood Technology Discipline, Khulna University	golamrakkibu@yahoo.co.uk
16	Mr. Hossain Mohammad Nishad Divisional Forest Officer, Social Forest Division, Dhaka, Forest Department	hmnishad@gmail.com
17	Mr. Md. Shahab Uddin Divisional Forest Officer, Wildlife Management and Nature Conservation Division, Forest Department	melonifcu@yahoo.com
18	Mr. Md. Baktiar Nur Siddiqui Divisional Forest Officer, Dhaka Forest Division, Forest Department	baktiar1971@gmail.com

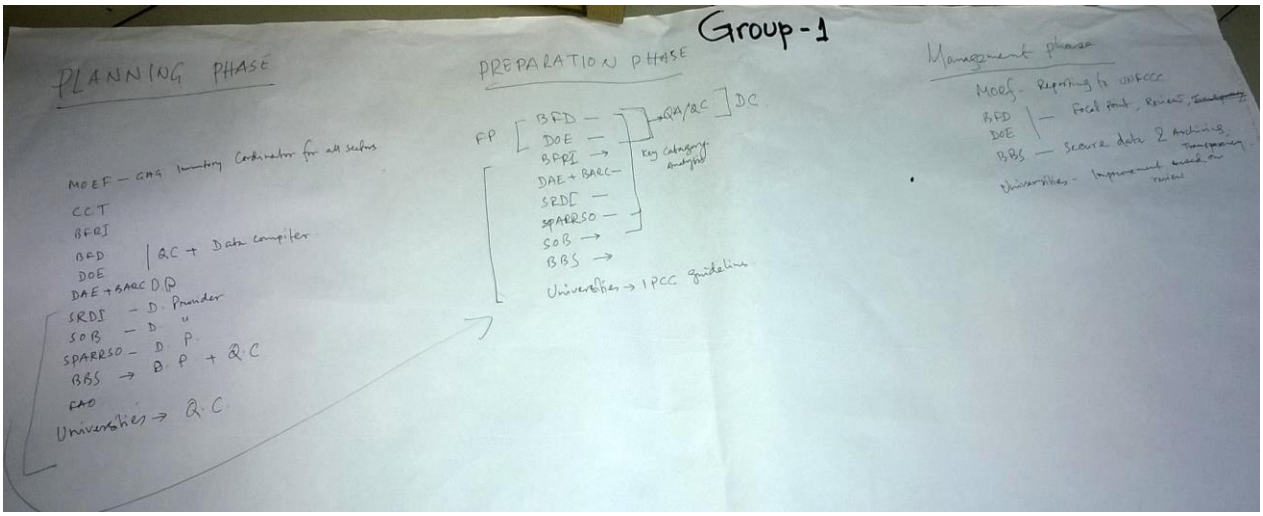
19	Mr. Quazi Md. Nurul Karim Assistant Conservator of Forests, Legal Unit, Forest Department	quazi.karim@gmail.com
20	Ms. Mahmudah Roksena Sultana Assistant Conservator of Forests, Development Planning Unit, Forest Department	sultana_rakhi@yahoo.com
21	Ms. Shamima Begum Shewli Research Officer, RIMS Unit, Forest Department	to.shewli99@gmail.com
22	Ms. Afroza Begum Research Officer RIMS Unit, Forest Department	b.afroza@yahoo.com
23	Mr. Md. Tariq Aziz Research Officer RIMS Unit, Forest Department	tariqaziz9718@gmail.com
24	Dr. Md. Abdus Salam Principal Scientific Officer, & Head of Forestry Department, Bangladesh Space Research and Remote Sensing Organization (SPARRSO)	salam2bd@yahoo.com
25	Mr. Md. Motiar Rahman, Assistant Soil Scientist, Bangladesh Forest Research Institute, Chittagong	Swapon-bfri@yahoo.com

Swapon-bfri@yahoo.com; salam2bd@yahoo.com; tariqaziz9718@gmail.com; b.afroza@yahoo.com; to.shewli99@gmail.com; sultana_rakhi@yahoo.com; quazi.karim@gmail.com; baktiar1971@gmail.com; melonifcu@yahoo.com; hmnishad@gmail.com; golamrakkibu@yahoo.co.uk; anita_musarrat@hotmail.com; nasir6318@gmail.com; nasim.aziz@iucn.org; mamun@cu.ac.bd; mtrahman63@gmail.com; bipul29@yahoo.com; jahirakon@ymail.com; fatima26bd@yahoo.com; lalpiprey@gmail.com; dcf.rims@gamil.com; makm_fyff@yahoo.com; badalarefin@gmail.com; munshiganj@doe.gov.bd; kibria_sust29@yahoo.com

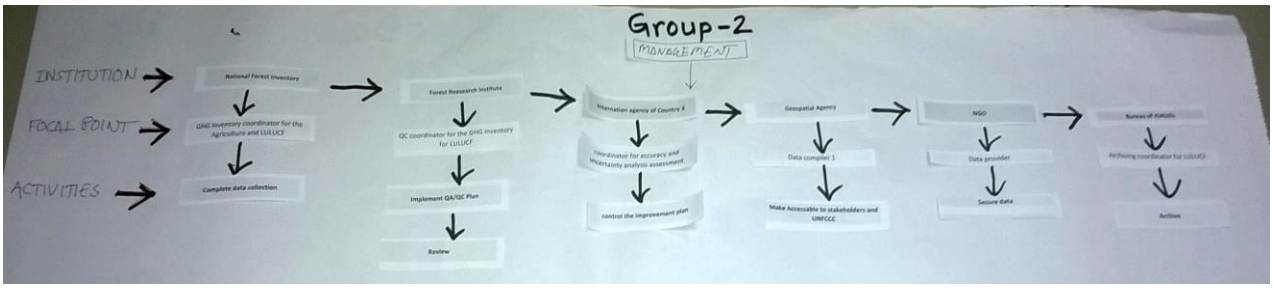
Appendix 3

Four groups were formed to perform an exercise for the preparation of institutional arrangements for the planning, preparation and management of the GHG inventory for the LULUCF sector. Different groups preferred different options for the institutional arrangement. To give an impression of the group works, snap shots of the sheets has been given below.

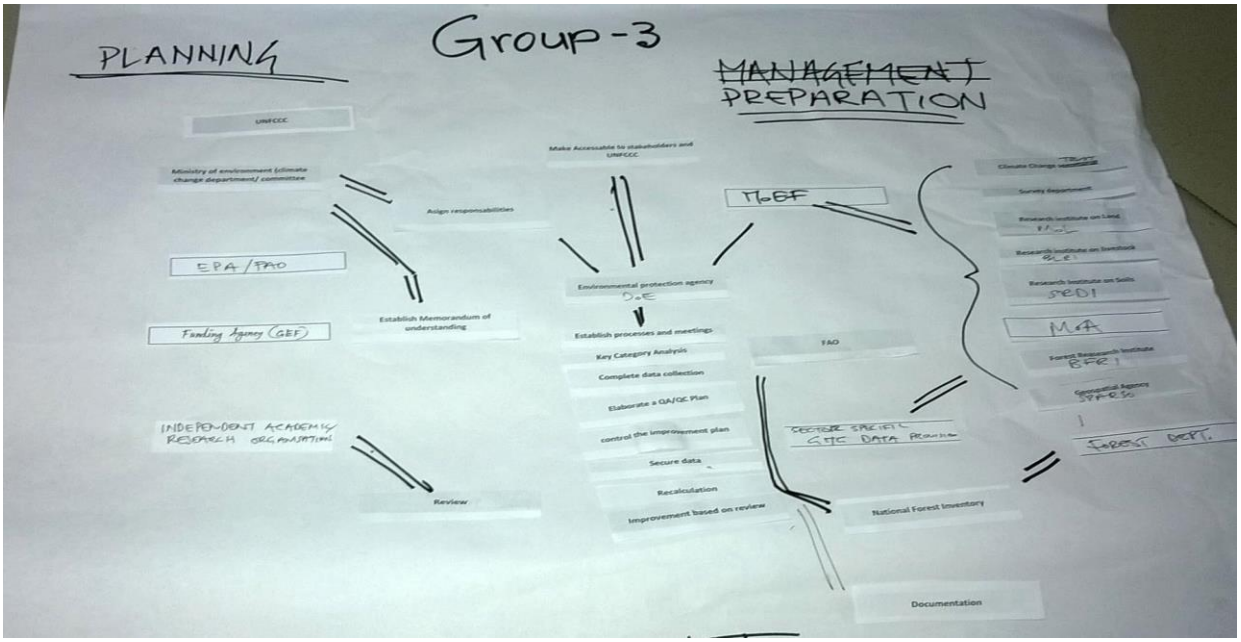
Group 1:



Group 2



Group 3



Group 4