Proceedings of the training workshop on drafting Bangladesh first forest reference emission levels/forest reference levels submission to the UNFCCC

Bangladesh Forest Department
16 – 17 May 2017

UN-REDD
PROGRAMME

The UN-REDD Programme, implemented by FAO, UNDP and UNEP, has two components: (i) assisting in developing countries to 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 channelling 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 Hasan Mukul
Project director
UN-REDD National Programme
Email:
pd-unredd@bforest.gov.bd

Matieu Henry
Chief Technical Advisor
Food & Agriculture Organization of the United Nations
Email: matieu.henry@fao.org

EXECUTIVE SUMMARY

As a signatory to the UN Framework Convention on Climate Change (UNFCCC) and in recognition of Decision 12/CP.17 of the UNFCCC, Bangladesh intends to submit its Forest Reference Level (FRL)/ Forest Reference Level Emission Level(FREL) as benchmark for performance measuring and monitoring of implementation of policies and measures in forestry sector. This country is highly climate vulnerable, and hence in some of the recent national documents like Climate Change Strategy and Action Plan (2009), Intended Nationally Determined Contributions (INDC), National Sustainable Development Strategy 2010-21 (NSDS), and 7th Five Year Plan (2016-2020) there is a clear indication of prioritizing low carbon development activities and increase the forest and tree cover. Bangladesh's forests, which was 13.2% (2013-14) of the total land area, and future quantified target in different national documents can make a significant contribution to both adaptation and mitigation of climate change impacts.

Ministry of Environment and Forests (MoEF) in collaboration with the Forest Department (FD), seeks to maximize this contribution by developing a national strategy for Reducing Emissions from Deforestation and forest Degradation, plus conservation, sustainable management of forests and enhancement of forest carbon stocks (REDD+), in accordance with the guidance set out in section III-C of Decision 1/CP.16. In view of this, the country is currently implementing the UN-REDD National Programme. One of the objectives of the national programme is to submit the FREL/FRL to the UNFCCC. As a part of the FREL/FRL calculation capacity development process, a training workshop was organized on 16-17 may, 2017, titled as "training workshop on Drafting Bangladesh first Forest Reference Emission Levels/Forest Reference Levels submission to UNFCCC". In total, 12 participants (all male) attended in this training.

FRL/FREL construction followed the guidance and guidelines of IPCC and the UNFCCC Decisions 12/CP.17 and 13/CP.19. The definition of the forest is not clarified with the Forest act, but a forest definition is explicitly mentioned in the National Forest and Tree Resources Assessment in 2005-07.The country has critical datasets at the national level like National Forest Inventory (NFI), landcover map 2015, tree cover change 2000-2014. So, the country can submit the national FREL/FRL. In the development of the FRL/FREL for Bangladesh, the carbon pools of above-ground biomass (AGB), below-ground biomass (BGB), soil organic carbon, dead wood and litter can be considered. CO_2 is the only GHG can be considered for the FREL/FRL, but non-CO_2 emission from fertilizer application from plantation can also be considered. Bangladesh can consider the following activities like Deforestation, Degradation, and Enhancement (afforestation and restoration)in the FRL/FREL.

It is recommended that, necessary steps should be taken for the legal approval of forest definition, state the difference between the forest land and forest, and to include tree outside the forests in the definition of forests. Apart from this, Soil organic carbon data should be collected from previous carbon inventory on Sundarban and other protected and reserved forests. Forest plantation journal of FD mentioned about fertilizer/nutrient application. So, fertilizer/nutrient application for forest plantation data should be collected.

CONTENTS

1. Introduction

As a signatory to the UN Framework Convention on Climate Change (UNFCCC) ratified on 15 Apr 1994 and entered into force on 14 Jul 1994, Bangladesh is committed to address the human-induced climate change threat in all sectors, through increasing the people and ecosystems resilience for adaptation measures, and by reducing the greenhouse gas (GHG) emissions for mitigation measures. The country's commitment was further emphasised by submitting two national communications to the UNFCCC in 2002 (based on data of year 1994) and in 2012 (based on data of year 1994), and the third national communication is expected to be submitted in the near future.

The country has developed a number of national documents for the national and international purpose like Climate Change Strategy and Action Plan (2009), Intended Nationally Determined Contributions (INDC), National Sustainable Development Strategy 2010-21 (NSDS), and 7th Five Year Plan (2016-2020). In all of these national documents and strategies there is clear indication of a target to increase the national forest and tree cover from 13.2% (2013-14) (GED 2013, GED 2015). Some of the quantified target in different national documents to increase the national tree and forest cover, reforestation/ afforestation, deforestation reduction, forest restoration are (i) increase of forest coverage from 13.20% (2013-14) to 15% with 70 % tree density by 2020(GED 2015), (ii) increased the percentage of protected forests from 1.81% (2013-14) to 5% by 2020(GED 2013, GED 2015), and (iii) 50000 ha, 5000 ha, 30,000 ha, 5000 ha of land will be planted in the hill forest, plain land forest, coastal areas, and reed lands of Sylhet region by 2020, respectively. An estimated 20,000 km. of strip plantations will be raised by 2020 (GED 2015). Bangladesh's forests, which was 13.2% (2013-14) of the total land area, and future quantified target in different national documents mentioned above can make a significant contribution to both adaptation and mitigation of climate change impacts.

In order to actively take part in the global GHG emission mitigation activities, the country is currently implementing the UN-REDD National Programme. One of the objectives of the national programme is to submit the Forest Reference Emission Levels/ Forest Reference Levels (FREL/FRL) to the UNFCCC, and technical capacity building on FREL/FRL computational procedure. In order to scale up the skilled human resources as well as technical expertise on FREL/FRL, FAO in collaboration with the Forest Department, are planning activities to strengthen technical capacities on FREL/FRL. This activity is crucial, because FREL/FRL submission is not one step process rather a continuous process, starting from FREL/FRL submission to result submission for result based payment.

In view of the above circumstances, the country wants to submit its first FREL/FRL in 2018. But submission of FREL/FRL require also the technical capacity building of the relevant stakeholders. As a technical capacity building process on FREL/FRL, the first training was held in Dhaka in 28-30 November, 2016. The objective of that training was to familiarize participants with the basic concept of FREL/FRL, the construction process, and the country examples of the FREL/FRL submission. The first workshop recommend that there should be another training focusing on existing historical data, emission factor, and drafting the submission document involving a core FREL/FRL team before its presentation to a wider range of decision-makers and stakeholders for national consultation. Based on the recommendation of the participant of the first workshop, the second training was held on 16-17 may, 2017, titled as "training workshop on Drafting Bangladesh first Forest Reference Emission Levels/Forest Reference Levels submission to UNFCCC".

2.   Objectives: training workshop

The objective of the training was to familiarize the participant with the existing historical data, emission factor, and computational procedure. The specific objectives were:
1. Present and review the available activity data and emission factors,
2. Present Bangladesh perspectives on National Forest Monitoring and National REDD+ Action Plan to ensure as much consistency as possible with other REDD+ elements,
3. Calculate and review the emissions and removals,
4. Discuss on the scope, scale and adjustments
5. Draft key content of the submission document (layout and main points discussed during the workshop).

3.   Summary of the presentation and exercise

3.1 Session 1: Existing activity and emission factor data and perspective on NFMS and NRAP

The country has develop National Tree cover 2000-2014 based on two satellite datasets, such as-wall-to-wall medium spatial resolution multi-temporal data for tree canopy cover and change mapping, and time-series of medium and high spatial resolution data for sample-based analysis. The wall-to-wall dataset consisted of Landsat multispectral imagery and digital elevation data. The sample- based dataset consisted of Landsat annual time-series data and time-series of very high resolution (VHR) imagery available through Google Earth. Data supplied and processed by GLAD (Global Land Analysis and Discovery) Lab, UMD. National Tree cover 2000-2014 was developed for the Hill forests, Mangroves, Sal forests, Swam forests, and outside forest area. The net tree cover change is estimated at an overall increase of the tree canopy cover within the country by 4.3% during the 2000-2014 time interval.

The country has also developed National land cover map of Bangladesh 2015 based on SPOT 6m multi-spectral images using national land cover classification system developed by the FD with the technical expertise of FAO Bangladesh. National land cover map of Bangladesh 2015 is integrated with the National Tree cover change map of 2000-2014. Integration of the tree cover and land cover map provide tree cover change per land cover class at national and sub-national level.

Biomass in tons/ha for the five BFI Zone, i.e. coastal, hill, sal, sundarban and village and national land cover map of Bangladesh 2015 has harmonized from eight inventory projects across 18 locations. Some of the past forest inventory of the country are (i) Forest Resources Management Project (FRMP) - Forest Inventory of the Natural Forests and Forest plantations, 1977, (ii) Forest Inventory of the Sal Forests of Bangladesh 2001, (iii) National Forest and Tree Resources Assessment 2005 -2007, (iv) Sundarban Carbon inventory 2009, (v) Forest Carbon Inventory at six Protected Areas (PAs) in Bangladesh 2009, and (vi) Forest Carbon Inventory at eight Protected Areas (PAs) in Bangladesh 2014.

The national forest monitoring system (NFMS) geoportal of Bangladesh is under development and expected to be operational by the end of this year. The NFMS of the country will be based on the integration of the national land cover and tree cover change map. The needed data will be provided by the national forest inventory like National Forest and Tree Resources Assessment

2005 -2007 and Bangladesh Forest Inventory 2016-2018. The NFMS is expected to improve the management of forest resources and assess the future results of REDD+ activities.

The country has also conduced deforestation and forest degradation study for the development of national REDD+ action plan (NRAP). The identified key direct and indirect drivers at the national level are presented in Figure 1. The country has also identified the barriers and future drivers, which can influence the REDD+ implementation presented in Figure 2.
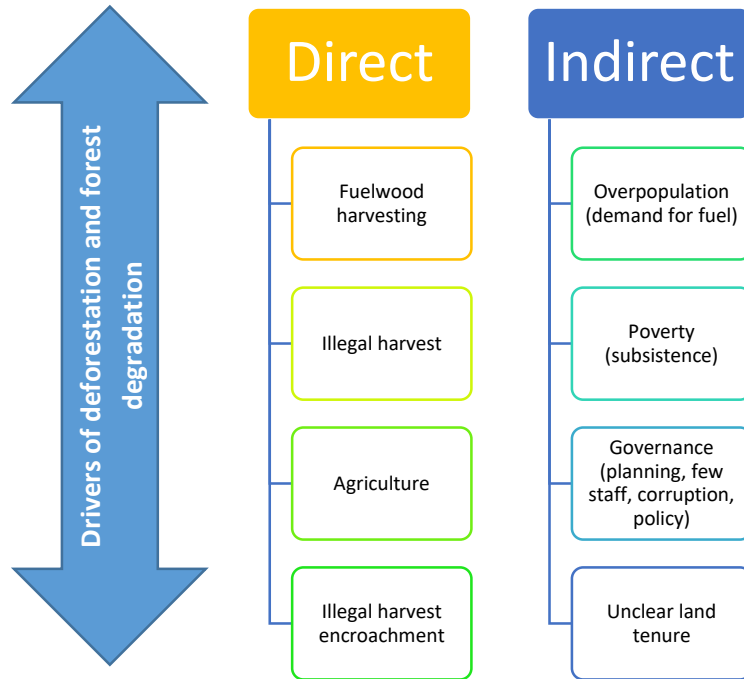

Figure 1: Direct and indirect drivers of deforestation and forest degradation in Bangladesh.
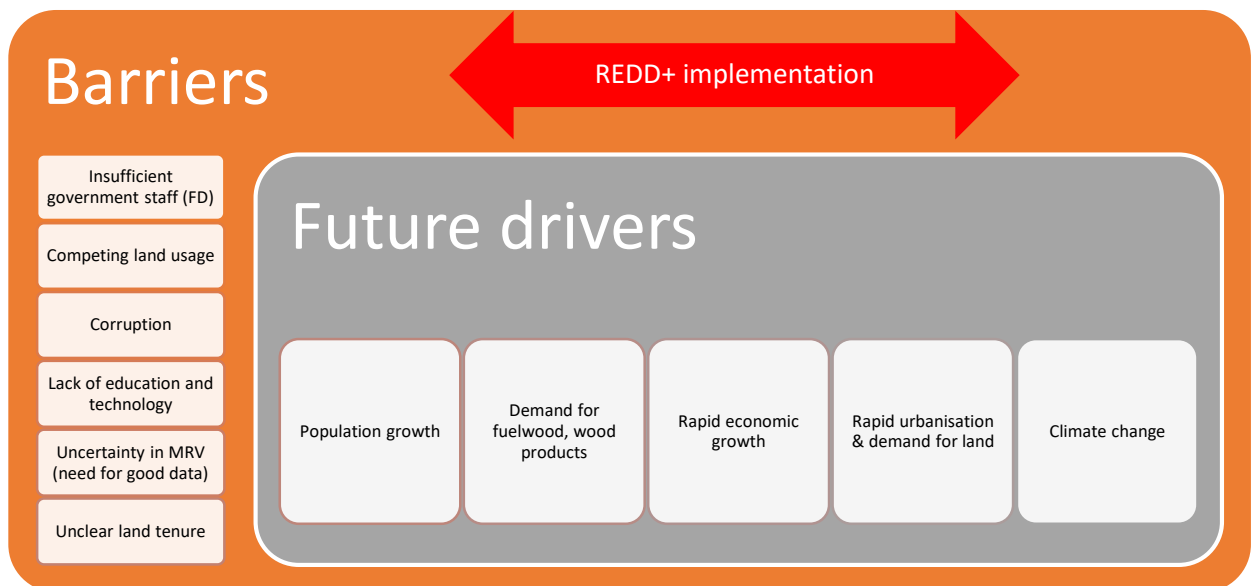

Figure 2: Barriers and future drivers having potential influence on REDD+ implementation.

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3.2 Session 2: Forest definition, scale and scope

Forest definition

According to the Forest Act, 1927 any land with the gazetted notification of Forests is known as forest. There are different legal status of the notified forest land located in different district of Bangladesh including:

1. Tropical Evergreen and Semi-evergreen Forest (Hill Forest): Majority areas are Reserved Forest[1] with smaller areas of protected[2], acquired and vested forest[3].
2. Tropical Moist Deciduous Forest (Sal Forest): Some areas are reserved forest, some are protected forest and some are acquired and vested Forest.
3. Mangrove Forest (Natural - Sundarban): Reserved Forest.
4. Mangrove Forest (Plantation): A part of the mangrove plantations in the coastal belt and off-shore islands has been notified as reserved forest and the rest is under the process of reservation.
5. Wet Land Forest (Swamp Forest): Reserved Forest or under process of reservation.

So, the legal instruments defines forest as land instead of using the common terms like canopy cover, area coverage and tree height. Thus the definition of 'forest' under the Forest Act does not represent the forested state of the land. As per the Forest Act potentially any state land, falling within the definition of 'any land with the gazetted notification of Forests' irrespective of its forest cover can be considered as forests. The key intention of such definition is to bring a broad category of land within the regulatory regime under the Forest Act. However, this definition is of concern because, it could constrain the identification of deforestation since both land with good forest cover and deforested land could be accommodated within the definition of 'forest' under the Forest Act, and the definition would not reflect any change in forest cover or degradation of the forest land.

Though, the definition of the forest is not clarified with the act, but a forest definition is explicitly mentioned in the National Forest and Tree Resources Assessment in 2005-07 as follows:

"A forest is an area of land spanning more than 0.5 ha with trees higher than 5m and a canopy cover of more than 10%, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use."

The above definition of forest includes:
- ➢ Areas of bamboo and palm, provided that height and canopy cover criteria are met;
- ➢ Forest roads, firebreaks and other small open areas;
- ➢ Forest in national parks, nature reserves and other protected areas such as those of specific scientific, historical, cultural or spiritual interest;
- ➢ Windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 ha and width of more than 20 m; and
- ➢ Plantations primarily used for forestry or protective purposes, such as rubber-wood plantations.

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[1] *Any land declared as forest under the purview of Forest Act by government or the competent authority of a country where everything is strictly prohibited unless or otherwise permitted.*
[2] *Everything in this forest is permitted except anything prohibited to do.*
[3] *Vesting of authority on Forest development officer's to prohibit certain activities within privately owned lands or other lands for the protection of publicly owned forest or for the protection of property and the environment.*

The above definition of forest excludes:
- ➢ Tree stands in agricultural production systems, for example in fruit plantations and agroforestry systems; and
- ➢ Trees in urban parks and gardens.

So, the country can use the forest definition mentioned above, and this definition is already used for the second national communication (MoEF 2012). But the definition is not circulated by any legal instrument. So, necessary steps should be taken for the legal approval of forest definition, state the difference between the forest land and forest, and to include tree outside the forests in the definition of forests.

Scale

According to UNFCCC decision 12/CP.17, countries should aim to implement REDD+ at the national level, but may implement at sub-national level as an interim measure if necessary. Implementing REDD+ at national level have advantages of avoiding internal displacement of emissions, and can ensure inclusion of the impact of national policies and measures. The country has critical datasets at the national level like National Forest Inventory (NFI), land cover map 2015, tree cover change 2000-2014. So, the country can submit the national FREL/FRL.

Pools

In the development of the FRL/FREL for Bangladesh, the carbon pools of above-ground biomass (AGB), below-ground biomass (BGB), soil organic carbon, dead wood and litter can be considered. The country has carbon inventory data for the Sundarbans and a number of reserved and protected forests. So, this data can be used to consider the above carbon pools.

Gases

CO_2 is the only GHG can be considered for the FREL/FRL, but non-CO_2 emission from fertilizer application from plantation can be considered. Forest plantation journal mentioned about fertilizer/nutrient application. So, it is possible to estimate the fertilizer/nutrient application for forest plantation.

Activity

Bangladesh can consider the following activities in the FRL/FREL:
- ➢ Deforestation
- ➢ Degradation
- ➢ Enhancement (afforestation and restoration).

3.3 Session 3: Calculations of emissions and removals

The activity data obtained from the land cover map 2015 and tree cover change map 2000-2014. It is assumed that, the land cover class of 2015 was same during 2000. The computational procedure adopted during the workshop for calculation of the emissions and removals is explained in graphically Figure 3. The calculation for the removals and emissions for the Sundarbans is presented in the appendix 5.

Forest lass	C stock (t/ha)
F	100
NF	0

E/R	F	NF
F	0	100(E)
NF	-100(R)	0

Emission factors (from harmonization of previous forest inventory data)

Activity data

2015 Land cover + 2000 tree cover + 2014 tree cover = Change 2000-2015

Emission & Removals

Polygon	2000	2015	Change	Area(ha)	EF(t/ha)	E/R(t C)	E/R(t CO_2)
1	F	NF	F->NF	15	100(E)	1500(E)	5500
2	NF	NF	NF->NF	100	0	0	0
3	NF	F	NF->F	20	-100(R)	2000(R)	7333
4	F	F	F->F	30	0	0	0

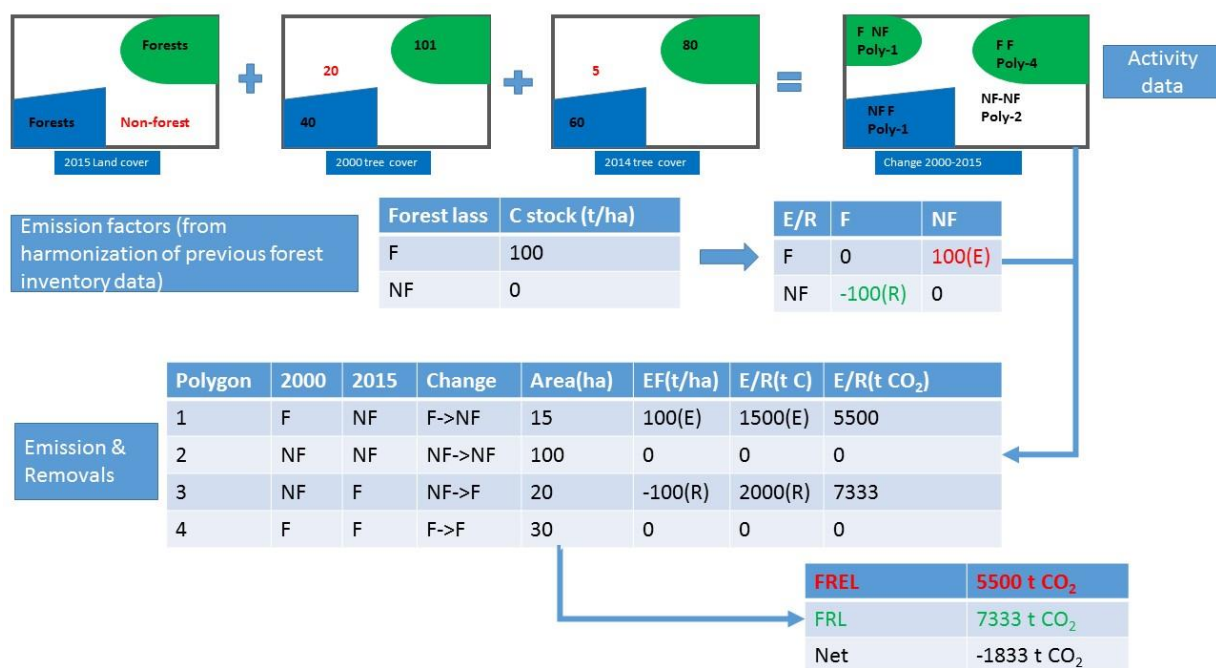| FREL	5500 t CO_2
FRL	7333 t CO_2
Net	-1833 t CO_2

Figure 3: calculation of the emissions and removals for the FREL/FRL construction.

Regarding the adjustment during the workshop the participant expressed that, different future government initiative potential to have impacts on the forest can be considered for the adjustment. But, this can be explained and discussed in details during the future national consultation on FREL/FRL.

4. RECOMMENDATIONS FOR NEXT STEPS

➢ Necessary steps should be taken for the legal approval of forest definition, state the difference between the forest land and forest, and to include tree outside the forests in the definition of forests.

➢ Soil organic carbon should be collected from previous inventory on Sundarban and other protected and reserved forests.

➢ Forest plantation journal of FD mentioned about fertilizer/nutrient application. So, fertilizer/nutrient application for forest plantation data should be collected.

➢ During the national consultation possible national adjustment should be discussed with the relevant stakeholders.

APPENDIX 1. AGENDA

Day 1		
8:30 – 9:00	Registration of participants	
9:00 – 09:30	Welcoming/Overview/Objectives Introduction of participants	Mariam Akhter FAO Consultant, UN-REDD National Programme Mr. Rakibul Hasan Mukul PD, UN-REDD National Programme
9:30 – 10:00	Recap of the FREL training November, 2016 Reminder on the FREL/FRL main steps	Antoli Gael Sola
10:00 – 10:30	Break	

10:30 – 12:30	**Session 1: Existing data and perspective on NFMS and NRAP**
	
	Presentations on available historical data for calculating activity data and emission factors:
	  ➤ Tree cover 2000-2014 (10 mins)
	  ➤ Integration of Tree Cover and Land Cover 2015 (10 mins)
	  ➤ Historical Land Cover (10 mins)
	  ➤ Emission Factors (10 Mins)
	
	Discussion Session (30 mins)
	Presentations on perspectives for NFMS and NRAP (REDD+ activities, Forest measurements for activity data and carbon stocks)
	  ➤ Perspectives on NFMS (10 mins)
	
	  ➤ Perspectives on NRAP (10 mins)
	
	Discussion Session (30 mins)
		Tarik
		Rashed Jalal
		Rashed Jalal
		Liam Costello
		
		Mariam Akhter
		FAO Consultant, UN-REDD National Programme
		
		Nasim Aziz
		Project Manager,
		UN-REDD National Programme

12:30 – 13:30	Lunch	
13:30 – 15:30	**Session 2: Forest definition, scale and scope**	All
15:30 – 16:00	Break	
16:00 – 17:00	*Drafting submission doc*	All
Day 2		
8:30 – 10:00	**Session 3: Calculations of emissions and removals**	All

10:00 – 10:30	Break	
10:30-12:30	**Session 3 (cont) : Calculations of emissions and removals**	All
12:30 – 13:30	Lunch	
13:30 – 14:30	**Session 4: national circumstances and adjustment**	
14:30 – 15:30	*Drafting submission doc*	
15:30 – 16:00	Break	
16:00 – 17:00	*Drafting submission doc*	

APPENDIX 2. PARTICIPANT LIST

Name	Gender	Designation	Organization	Phone	Email
Md. Amir Hossain Chowdhury	M	CF, Khulna Circle	BFD	1712195948	amirhdfo@yahoo.com
Md. Baktiar Nur Siddiqui	M	DFO, Dhaka FD	BFD	1711819670	baktiar1971@gmail.com
Sayeed Mahmud Riadh	M	Governance coordinator	UN-REDD, UNDP	1739119920	sayeed.riadh@undp.org
A. Z. M. Manzoor Rashid	M	Professor & Head	Department of Forestry and Environmental Science, Shahjalal University of Science and Technology	1711302555	pollen_forest@yahoo.com
Md. Sayed Ali	M	DFO, Sundarban West Forest Division	BFD	1819810303	sayed13143@gmail.com
Mahmood Hossain	M	Professor	Khulna University	1711959380	mahmoodhossain@hotmail.com
Md. Golam Rakkibu	M	Professor	Khulna University	1730062903	golamrakkibu@yahoo.co.uk
Md. Al-Amin	M	Professor	IFESCU	1819820184	prof.alamin@yahoo.com
Md. Rakibul Hasan Mukul	M	PD	UN-REDD	1711438032	lalpiprey@gmail.com
Zaheer Iqbal	M	DCF, RIMS Unit	Bangladesh Forest Department	1711443750	z.iqbal60@gmail.com
Naism Aziz	M	Programme Manager	UN-REDD	1715032875	nasim.aziz@undp.org
Bablu Zzaman	M	Forester	BFD	1718003727	zzaman1978@gmail.com

APPENDIX 3. EVALUATION RESULTS

	How often do you participate in training related to forest monitoring?	
	First time	25%
	1-3 every year	50%
	More than 3 per year	0%
	Regularly (approximately one per month)	25%
	I would describe my self as?	
	A professor/academic	50%
	A student	0%
	Forest Department staff	25%
	Government staff (outside Forest Department)	0%
	NGO staff	0%
	Private consultant	0%
	Other	25%
	My professional background relates most closely to:	
	Forester	100%
	GIS/RS	50%
	Statistics	25%
	Social survey/assessment	25%
	Economics	0%
	Natural Resource Management	100%
	Ecology	25%
	other	25%
	My years of relevant experience is:	
	1-2 years	25%
	3-5 years	0%
	5-7 years	0%
	8-10 years	0%
	More than 10 years	75%
	The training was relevant to my daily work	
	Strongly agree	25%
	Agree	75%
	Neutral	0%
	Disagree	0%
	Strongly disagree	0%
	I had enough previous knowledge to understand the content of the event	
	Strongly agree	25%
	Agree	50%
	Neutral	0%
	Disagree	25%
	Strongly disagree	0%
	The training met my expectations in terms of the content and learning outcomes	
	Strongly agree	50%
	Agree	50%
	Neutral	0%

	Disagree	0%
	Strongly disagree	0%
	The learning resources provided were adequate and useful	
	Strongly agree	0%
	Agree	75%
	Neutral	25%
	Disagree	0%
	Strongly disagree	0%
	The resource person presented information in a way that i could understand and was easy to follow	
	Strongly agree	50%
	Agree	50%
	Neutral	0%
	Disagree	0%
	Strongly disagree	0%
	I feel confident to be able to carry out the tasks described in the training without supervision.	
	Strongly agree	25%
	Agree	50%
	Neutral	25%
	Disagree	0%
	Strongly disagree	0%
	I was pleased with the venue/meeting room/snacks etc	
	Strongly agree	25%
	Agree	75%
	Neutral	0%
	Disagree	0%
	Strongly disagree	0%
	ministry of forests and environment	
	Officers from DOE.	
	For this training the participants should have academic background in Forestry and GIS /RS. The officers from the ministry should be involved.	
	Need further meeting to make draft FREL.	
	Activity data, conversion factors and emission factors could be more comprehensive and practical. Land cover classes and sample polygon representing landuses could be optimized.	
	The UN REDD staff who's academic background is in Forestry or who has the experience of working in GIS/RS and who is involved in the development of National Strategy should be included in this training.	

APPENDIX 4. EVALUATION QUESTION

How often do you participate in training related to forest monitoring?
I would describe myself as?
Describe other
My professional background relates most closely to:
Describe other
My years of relevant experience is:
The training was relevant to my daily work
I had enough previous knowledge to understand the content of the event
The training met my expectations in terms of the content and learning outcomes
The learning resources provided were adequate and useful
The resource person presented information in a way that i could understand and was easy to follow
I feel confident to be able to carry out the tasks described in the training without supervision.
The event was well organised and I was pleased with the venue/snacks etc.
Are there other people/agencies/organisations that you think should have been included in the training?
Any other comments?

APPENDIX 5. EXAMPLE OF CALCULATION OF SUNDARBAN

Land class	Area (ha)	Emissions tCO2/year	Removals tCO2/year
Brackish Water Aquaculture	848	0	0
Brickfield	14	0	0
Herb Dominated Area	995	0	0
Mangrove Forest	398,821	4,949	-54,156
Mangrove Plantation	244	0	-19
Mud Flats or Intertidal Area	1,825	0	0
Multiple Crop	2	0	0
Orchards and Other Plantations (Trees)	32	0	-45
Ponds	3	0	0
River Banks	4	0	0
Rivers and Khals	200,260	0	0
Rural Settlement	907	6	-243
Sand	537	0	0
Single Crop	987	0	0
(blank)			
Grand Total	**605,478**	**4,955**	**-54,463**

REFERENCES

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GED (2015). 7th Five Year Plan (2016-2020) Dhaka, Bangladesh, General Economics Division (GED),Planning Commission, Government of the People's Republic of Bangladesh: 736.

MoEF (2012). Second National Communication of Bangladehs to the United Nations Framework on Convention on Climate Change Ministry of Environment and Forests (MoEF), Government of Bangladesh: 242.