



# Proceedings of the national training workshop on data sharing, institutional arrangements and tools for GHG gases for the Agriculture, Forestry and other Land Use sector (AFOLU)



**Bangladesh Forest Department**  
**06 – 08 December 2016**

**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.

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 National Training Workshop on data sharing, institutional arrangements and tools for GHG estimation for the Agriculture, Forestry and Other Land use sector (AFOLU) was held from 6 to 8 December at the Bureau of Statistics in Dhaka, 2016. With the aim to strengthen data exchanges and robustness of natural resources data in the AFOLU sector, a national workshop was organised from 6 to 8 December at Bureau of Statistics in Dhaka, involving 48 participants (36 male and 12 female) from 26 organizations.

The workshop was divided in three day session (1) data sharing, (2) institutional arrangement and (3) GHG emission estimation tools. Group exercises were organized with the aim to identify the data gap, focal person of data sharing and status of data sharing policy and functions of different entities for the institutional arrangement of GHG emission reporting of Bangladesh.

The evaluation results showed that the training met the participants' expectations in terms of the content and learning outcomes and the training materials were adequate and useful. Most of the participants expressed that, there need an urgent arrangement for logical and physical data sharing framework, such as MoU of relevant organization. Moreover, denveloping an effective platform through facilitating quarterly meeting among relevant organizations is also suggested by the participants.

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# 1. INTRODUCTION

Natural resources like land, forests, water and energy, are tremendously significant for growth and poverty reduction. Sustainable management of such resources has long been a subject of research and discussion. Climate change increases this pressure more. In terms of how to adapt to changing climate conditions in developing countries like Bangladesh, use of natural resources and their management has importance to achieve climate change mitigation goals along with adaptation.

The Conference of parties (COP) agreed that parties (signatory countries) should cooperatively aim to slow, halt and reverse forest cover and carbon loss, in accordance with national circumstances, and consistent with the key objective of United Nations Convention on Climate Change (UNFCCC) for achieving greenhouse gas (GHGs) concentrations stabilization in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The signatory countries of the UNFCCC are trying or express their intention to reduce national GHGs emission in accordance with the convention for the sectors like energy, transportation, industry, because these sectors have highest contribution for national level GHGs emission.

Along with the mentioned sectors, agriculture, forestry, and other Land Use (AFOLU) is unique because this sector has two fold mitigation potential, such as- (i) enhancement of removals of GHGs from atmosphere, and (ii) reduction of existing emissions through management of land and livestock. In addition, the AFOLU sector is crucial and should be considered for climate change adaptation, particularly in countries such as Bangladesh with agricultural-based economy [1, 2].

The significance of AFOLU sector is formally recognized in relation to climate change mitigation and adaptation under the Paris Agreement [3], and it was declared that all the parties should instigate necessary action to conserve and enhance GHGs sinks and reservoirs (Decision 1/CP.21). The AFOLU sector is accounted for around 25% (~10 to 12 Gt CO<sub>2eq</sub> per year) of global GHG emissions from anthropogenic sources, largely from deforestation, and agricultural emissions from livestock, soil and nutrient management [4]. It is matter of fact that, GHGs emission from AFOLU sector is highest from Asia, and it is the key contributor at the national level in Bangladesh (50-60%).

National plan of Bangladesh like 6th Five Year Plan (2011-2015) [5], and Climate Change Strategy and Action Plan [2] do address the targets/measures/strategy for AFOLU emission reduction, though not addressed clearly in intended nationally determined contributions (INDCs) like the energy and industry sector as presented in table 1. The INDC do address the unconditional emission reduction of 5% (12 Mt CO<sub>2eq</sub>) below 2030 BAU scenario in the power, transport and industry sectors, and conditional 15% (36 Mt CO<sub>2eq</sub>) emission reduction below 2030 BAU scenario in the power, transport, and industry sectors.

Bangladesh as a member of non-Annex I Parties has technical capacity constraints for preparation of UNFCCC reporting documents like National communication (NC) (decision 9/CP.16), Biannual Update Report (BUR) (decision 2/CP.17), Intended Nationally Determined Contributions (INDCs) (decisions 1/CP.19 and 1/CP.20), Nationally Appropriate Mitigation Actions (NAMAs) (decision 1/CP.13), Forest Reference Emission Level (FREL)/Forest Reference Level (FRL) (decision 1/CP.16; decision 12/CP.17; decision 13/CP.19)), mostly because of inadequate capacity to collect and share data, institutional arrangement among the concerned government agencies, and lack of skills and knowledge about emission estimation tools related to AFOLU. To develop well referenced, and documented as well as consistent UNFCCC reporting documents mentioned above, and for natural resource management in general, it requires a common platform for data sharing and institutional arrangement among the concerned government agencies to comply with the TCCCA (transparent, consistent, comparable, complete and accurate) reporting principles of GHG inventory.

To comply with the TCCCA principle at this moment it needs to identify at first the needed data and relevant organization for AFOLU sector, then a platform for easy sharing of the data, and for coordination of the total process an efficient institutional arrangement. In addition to these structural change, familiarization with the existing GHG emission estimation tools and databases is also indispensable.

## **2. OBJECTIVES**

Considering the future requirements of meeting the TCCCA principle for the national GHG inventory and other reporting to the UNFCCC as well as other natural resources reporting from non-Annex I Parties, a national training workshop on data sharing, institutional arrangements and tools for GHG gases for the Agriculture, Forestry and Other Land use sector (AFOLU) was jointly organised by the Forest Department (FD) and the Bangladesh Bureau of Statistics (BBS), with support from the FAO and held in Dhaka at the BBS conference room from December 6 to 8, 2016. The objectives of the workshop were as follows:

1. Identify the data availability for the AFOLU sector;
2. Identify possible ways to facilitate the process of data sharing between different Departments;
3. Provide information on the development of a data sharing platform;
4. Identify entities and institutional, legal and procedural arrangements that are fundamental in the AFOLU sector;
5. Identify possible methodologies and tools used to estimate emissions reductions in the AFOLU sector

The objectives were therefore consistent with the final scope of the capacity building activities related with national GHG inventory of the implementing agencies, which will allow Bangladesh to prepare the UNFCCC reporting as well as other natural resources reporting with consistent, updated and transparent data. As a follow up of the Workshop, the Proceedings are aimed at helping Bangladesh and stakeholder's capacity building involved with AFOLU sector to efficiently set up the national system for the GHG inventory and other natural resources reporting.

## **3. TRAINING OUTCOMES**

This section provides the summary of the main topics covered during the presentations of three day starting from 6<sup>th</sup> December to 8<sup>th</sup> December, 2016 during the Workshop. The information is chronologically ordered according to the day, speech and presentation schedule. The speaker and presenter name as well as presentation date and time is provided on the side of the corresponding paragraphs. The PDF of the presentation, the schedule as well as other supportive information attached as appendix to this training workshop proceedings.

### **3.1 Day one: Data sharing theme**

#### **3.1.1 Inaugural session**

The chairperson of the inaugural session was Mr. Abani Bhushan Thakur, Deputy Chief Conservator of Forests, Forest Department. Dr. A. Atiq Rahman, Executive Director, Bangladesh Centre for Advanced Studies (BCAS) was presented as chief guest. Mr. David Doolan, Deputy FAO Representative in Bangladesh was also grace the occasion as Guest of Honour. Mr. Rakibul Hassan Mukul, Project Director, UN-REDD National Programme, Forest Department of Bangladesh presented the welcome speech. The key message of this inaugural session are as follows:

- Due to lack of proper archiving and sharing of data most of the data lost. So data sharing mechanism is urgently needed for the consistent and transparent reporting performance of Bangladesh to the UNFCCC.
- Access to data for decision making in natural resources management is fundamental in all countries around the world, particularly in view of climate change environmental crisis. Wrong Data leads to wrong outcome. Bangladesh is the most vulnerable countries in the world, and to overcome such vulnerability as well as being a ratified country of the Paris Agreement, the flow of data and information between national institutions on agriculture, forestry, and other land uses needs to be significantly increased to ensure proper decisions regarding climate change adaptation and mitigations measures, and natural resources management in general.
- Absence of data sharing results into duplication of information or efforts leading to resources loss such as financial, technical and time. Moreover, inappropriate allocation of the resources leading to inadequate planning and decisions. Accuracy, transparency, compatibility is essential in data sharing process. So, the concerned agency should be aware about data duplication and also ensure annual review.
- Vulnerability to climate change impact could have many fold. Damage assessment on different sectors because of climate change impact, depends on sectoral data sharing among the government entities. Data is the base of good decision. Hence, appropriate and precise data is essential for good decision making process. Climate change has impacts on lots of sectors like agriculture, fisheries, poverty reduction. So, to deal with the uncertainty of data we need better data sharing process to make informed decision.
- The accuracy of data is also important for informed decision. To ensuring credibility of third national communication to the UNFCCC it needs accurate data through data sharing processes. Data sharing has immense importance for mitigation, adaptation process and even for the loss and damage assessment. Identification of data gap, and development of data sharing mechanism to share data among the different government department will ensure a transparent GHG inventory from Bangladesh.

### 3.1.2 Technical session

The technical session is started with an animated video to show the consequences when the data is not shared through a proper channel and not archived and referenced properly. This video nicely depicted the difficulties of the user of data, when the data is not accompanied with the user guide. The key message of this technical session are as follows:

- Not only data insufficiency and unreliability but also the sharing of data is the major problem. Data are not easily accessible in Bangladesh, because of lack of clarity of ownership of data, security concern, unwillingness or lack of culture of data sharing, common data standard, and inappropriate data archiving. So, data harmonization, data sharing agreement, and ensuring data security is needed to strengthen data sharing process. To improve data availability and data sharing, the stakeholders should be familiar with the different data sharing mechanism. [Presentation title: *Importance of data availability, reliability and data sharing* by Mr. Shaheduzzaman, Project advisor and national team leader, FAO]
- Agriculture, forestry and other land use (AFOLU) sectors is responsible for 24% of total GHG globally. 50%-60% of the total GHG emission in Bangladesh is from AFOLU sectors. The constraints of AFOLU sector data sharing are lack of intellectual property rights, absence of data sharing policy, lack of institutional arrangements, sustainability of data sharing efforts, and lack of familiarity about data sharing mechanism. To overcome such data sharing obstacles, the probable data sharing mechanism could be gentleman agreement, memorandum of understanding, copyright license agreement, formulating data sharing policy, joint publication, copyright assignment/request, and legislative

guideline at national level. From the survey it was observed that, among the relevant organization of AFOLU sector, 13% of organization do not share data on forest, agriculture, wetland, land management or livestock, 40% organization have data on tree volume but not publicly published, and 26% of organizations provide information on areas of settlement but none of them are consistent. 34% of organizations do not share their data on internet or do not have a website. 52% of organizations reported free data access is in their organizations, 48% provide data on request through letter, 43% provide data through MoU, 35% rely on data sharing agreement, and 13% provide data through payment. 74% of organization share their data in hard copies, 70% share data in PDF file, 30% share shapefile, and 17% share raster database. [Presentation title: *overview of data sharing mechanisms and summary of questionnaire results on data sharing* by Mr. Nazmul Islam and Ms. Anatoli Poultouchidou, UN-REDD consultant, FAO Bangladesh]

- Bangladesh's government already took initiative to develop e-governance through coherent collection of policies, standards, and guidelines to guide government agencies in the design, acquire implement, and manage information, communication and technologies. Under the National Enterprise Architecture (NEA) the domain are *Business, data, application, interoperability, mobility, technology, and security*. Vision of digital government cannot be achieved without whole of government enterprise architecture, and most importantly without data interoperability. So, to ensure interoperability a common set of standards for the exchange of data and information is needed. Bangladesh government is willing to develop this interoperability to providing service to the citizen through a single platform. [Presentation title: *National Enterprise Architecture and interoperability framework initiative* by Mr. Tanimul Bari, technical specialist, leveraging ICT for Growth, Employment and Governance Project, Bangladesh Computer Council, Ministry of ICT]
- Spatial data infrastructure is depends on the metadata, and the technical standards. That is why Bangladesh government is developing National Spatial Data Infrastructure (NSDI). The NSDI is needed for the successful implementation of sustainable development goals of Bangladesh, for example for crop yield planning and forests and biodiversity loss assessment. The challenge of developing NSDI in Bangladesh, are adoptions of standards, geospatial data interoperability, national institutional arrangements, partnership arrangements, and policy and legal issues. [Presentation title: *National Spatial Data Infrastructure (NSDI) for Bangladesh* by Mr. Sayed Mohammad Masum, Assistant Director (In Charge, GIS Section), survey of Bangladesh]
- Bangladesh Geographical System Platform (BGISP) of Bangladesh Bureau of Statistics (BBS) is planned to be serve as a platform for GIS related coordinating organization. It will follow Statistical act 2013. As per the policy of this platform, All GIS related organization will be a member of BGISP. BGISP is in initial process, and they are working to bring in all the spatial and census data in single platform, for example BBS produce small area atlas with geo-code using population census data, and they are also developing WEB based thematic map. [Presentation title: *Bangladesh Geographical System Platform (BGISP)* by Mr. Md. Zahidul Haque, Project Director GIS project, Bangladesh Bureau of Statistics (BBS)]
- Spatial data has been collected by Bangladesh Delta Plan 2100 from WARPO, BARC, BWDB, BMD, RHD, LGED, SRDI, in the digital or hard copy format, and some tabular data has been collected from various organizations like BBS, DoE, DoF. For data archiving, around 136 data layers are organized into 7 groups such as water resources, disaster management, spatial planning and land use, environmental management, economic finance, food security, and basic data. They are planning to share the data via online tools named as touch table and also through desktop version. [Presentation title: *Data sharing and archiving: Bangladesh Delta Plan 2100* by Mr. Giasuddin Choudhury, Deputy Team Leader, Bangladesh Delta Plan 2100, General Economics Division, Bangladesh Planning Commission]
- Under the national Land Zoning Project the best possible uses of land will be identified like agriculture, forestry, fisheries, rural and urban settlement, and tourism, industrial and commercial development in



order to get maximum economic benefits from lands and resolving all conflicts of interest. Landsat Sentinel and Rapideye satellite image used. The expected outputs could be union-wise digital land use map, and land zoning database and information system. The generated maps as well as all features and reports regarding agriculture, forest, fisheries, environment, socials, etc. will be stored in the National Database Land Zoning office, Ministry of Land and Bangladesh Computer Council. Respective user may download according their requirements. [Presentation title: *National Land Zoning Project* by Mr. Md. Mahbubur Rahman, GIS & Remote Sensing Specialist, National Land Zoning Project, Ministry of Land]

- GeoDash is a customized GeoNode software, and It Catalyzes and facilitates spatial data sharing between government/national/international stakeholders. GeoDASH principled to make data simple to share, provide user statistics, user can easily add comments, rate or tags, allow collaborative findings, allow connectivity between different GeoDASH, and allow uploading open street map data. Already some of the organizations like BCC, BTCC, LGED, Titas, DDM, RAJUK, DNCC, DSCC joined this data sharing platform. AFOLU sectors can be benefitted from GeoDASH, such as improvement in Information, decision making, reaction time, reduce time in government service and transaction, value adding to agency data, and reduce duplication. The major challenges pointed out as unwillingness in sharing data, long practiced mind set, lack of inter department relationship, ICT support, Lack of co-ordination among the similar projects. Anyone can join by registering to this platform. [Presentation title: *GeoDASH: Geospatial Data Sharing Platform* by Mr. Ahasanul Hoque, GIS & Data management Specialist, World Bank]
- Bangladesh government is planning to establish open government data sharing platform to serve as the government's one-stop portal having publicly available datasets from more than 35 Ministries and related agencies. Government is developing this platform to Increase service offering, increase revenue, cost reduction, expansion of services, innovative solution for national issues. This open government data sharing platform and right to information act can create eco-system of data sharing. [Presentation title: *Open government data sharing platform* by Mr. Manik Elahi, IT Manager, A2I Prime Minister's Office]

### 3.1.3 Group Exercise

All the participants representing a number of organization related the AFOLU sector (please see the appendix section for details list of participants) were divided into four group for the exercise on data sharing. The first group task was to report the missing information from the conducted survey on the relevant government department and organization of AFOLU sector in Bangladesh. The second one was more informative with the objectives of identifying the focal person of each organization represented in the training workshop for data sharing with their contact details, as well as to know about the existence of data sharing policy of each organization. The last group task was to formulate dummy license agreement by each group for data sharing. The findings of the group exercise are presented here.

Table 1 represents the different participating organization divided in four groups for the group exercise. Table 2 represent the identified missing information from the result of the conducted survey (please, see the appendix 4 for the details result of the conducted survey). Group 1 identified the missing working discipline in the conducted survey for a number of organization like, participant from CEGIS mentioned that, their working arena also belongs to the discipline of forest, wetland, and agriculture. Similarly other group also identified some other missing information like, BNH representative identified they have plant species data, and they also have the documentation of the data, but not archiving. Similarly, DAE representative identified they have data related to agriculture land use, cropping intensity, cultivated area, cropping pattern, rice production technology, and fertilizer used. They already have data sharing program through MoU and data request letter. They usually share data in the format like doc, xls, pdf, and tif, and they do not have any data archiving.

Data sharing focal person identified by the representative of different organization presented in the table 3. All the participant provided the information for data sharing focal person. Some of the representative did not provided the contact address on the ground that, their contact address usually provided in the website as well as the position is not fixed with one person, rather the responsible person can be transferred from one position to another.

Table 4 presented the status of data sharing policy of the organization. Out of 16 participating organization, 7 organizations have data sharing policy, 1 organization has forthcoming data sharing policy, 4 organizations are planning to have a data sharing policy, and 14 organization do not have data sharing policy or have no intention to have data sharing policy.

The outcome of the developing a data sharing license policy by the different group is presented in table 5. It was observed that, most of the participant willing to develop the data sharing license agreement validate for Specific project/contract, while they prefer to provide the license of using the data for any purpose, and derivative works can be distributed. Regarding the ownership, one group has not identified any criteria, but the remaining three group have the same choice. Regarding the user permission, two group developed the license agreement with no restriction for any type of use, and one group wants to provide the use right only for the project purpose, and one group has not chosen any option.

Table 1: Group composition of the data sharing exercise

Group name	Group member organization
Group 1	Bangladesh Agricultural Research Council (BARC)
	Department of Forestry and Environmental Science, Shahjalal University of Science & Technology (SUST).
	Bangladesh Bureau of Statistics (BBS)
	Forest Department (FD)
	National Land Zoning Project, Ministry of Land (MoL)
	Department of Livestock Services (DLS)
	Institute of Water Modelling (IWM)
Group 2	Forest Department (FD)
	Soil Resource Development Institute (SRDI)
	Arannyak Foundation
	Bangladesh National Herbarium (BNH)
	Planning Commission
Group 3	Bangladesh Space Research and Remote Sensing Organization (SPARRSO)
	Department of Bangladesh Haor and Wetland Development
	Bangladesh Forest Research Institute (BFRI)
	Water Resources Planning Organization (WARPO)
	Center for Environmental and Geographic Information Services (CEGIS)
	Bangladesh Computer Council (BCC)
	GIZ
Group 4	Survey of Bangladesh (SoB)
	Forestry and Wood Technology discipline, Khulna University
	Nature Conservation Management
	Forest Department (FD)
	Bangladesh Rural Advancement Committee (BRAC)
	Department of Environment (DoE)
	Department of Agriculture Extension

Table 2: Identified missing information in the conducted survey during the group exercise.

Group name	Organization	Working arena	Data	Others
Group 1		BBS- Land records		
		CEGIS-Forest, Wetland, Agriculture and Land		
		Khulna university - Environmental, Wetland, Agriculture and Land		
		DLS-Land use		
		FD-Forest and Land		
Group 2			BNH-Plant species data	BNH-Data request from university, collage and researcher. BNH-No archiving, but documentation. BNH-Willing to share data thorough MoU.
		FD-Forest (not environment)	FD-Carbon estimates, Tree volume, plantation data, Flora and Fauna, Tree cover in settlement.	FD- Data request from university and researcher.
Group 3			DBHWD-Classification of wetland	DBHWD- www.dbhwd.gov.bd
			BFRI-Bamboo cultivation, Pest management, Plant species, soil data forest volume.	BFRI-www.bfri.gov.bd BFRI-No archiving but documentation.
			SPARRSO-Satellite image and aerial photo.	SPARRSO- www.sparrso.gov.bd
			WARPO-1000 spatial data layers.	
			BCC-ICT service/data hosting	BCC-www.bcc.gov.bd
Group 4	Nature Conservation Management (NACOM)		NACOM-Environment, Agriculture, Forest, Livestock	
			FD-Forest area, types, plantation, non-timber forest products	
			DAE-Agriculture land use, cropping intensity, cultivated area, cropping pattern, rice production technology, fertilizer used	www.dae.gov.bd Data request-rice cultivation area, production, fertilizer use. Data sharing-MoU, data request letter Data format-doc, xls, pdf,tif No data archiving.

Table 3: Data sharing focal person of the training participant's organization.

Group name	Organization name	Data sharing Focal person	Contact
Group 1	Bangladesh Agricultural Research Council (BARC)	Director (Research and & Development )	
	Department of Forestry and Environmental Science, Shahjalal University of Science & Technology (SUST).	Faculty Resource person	
	Bangladesh Bureau of Statistics (BBS)	Director General (DG)	
	Forest Department (FD)	Chief Conservator of Forest (CCF) & Deputy Conservator of Forests (DCF), RIMS	
	National Land Zoning Project, Ministry of Land (MoL)	Project Director	
	Department of Livestock Services (DLS)	Director General	
	Institute of Water Modelling (IWM)	Executive Director	
Group 2	Forest Department (FD)	Deputy Conservator of Forests (DCF), Legal	
	Soil Resource Development Institute (SRDI)	Principle Scientific officer (PSO), Training	Available in Website
	Arannyak Foundation	Executive Director	<a href="mailto:farid@arrannayk.org">farid@arrannayk.org</a> Mob:01713040583
	Bangladesh National Herbarium (BNH)	Mohammad Rashedul Hakim Programmer	Mob: 01552380999
Group 3	Bangladesh Space Research and Remote Sensing Organization (SPARRSO)	Chairman	
	Department of Bangladesh Haor and Wetland Development	Mohammad Nazmul Ahsan, Deputy Director	Mob: 01711960806
	Bangladesh Forest Research Institute (BFRI)	Director	Mob: 01715216818
	Water Resources Planning Organization (WARPO)	Principle Scientific Officer (CIS)	pso_cis@warpo.gov.bd
	Center for Environmental and Geographic Information Services (CEGIS)	Executive Director	Mob: 01715833006
	Bangladesh Computer Council (BCC)	Director (Data Center)	datacenter@bcc.gov.bd
Group 4	Survey of Bangladesh (SoB)	Assistant Surveyor general	Phone: 029114191
	Forestry and Wood Technology discipline, Khulna University	Registrar	041720171-3, EXT: 504
	Nature Conservation Management	Director	Mob: 01713129947
	Forest Department (FD)	Deputy Conservator of Forests (DCF), RIMS	Dcf.rims@gmail.com
	Bangladesh Rural Advancement Committee (BRAC)	Research and Development Department	
	Department of livestock services	Director General	Phone: 029101932
	Department of Environment (DoE)	Deputy Director (IT)	Mob: 01714588195
	Department of Agriculture Extension (DAE)	Additional Director (Monitoring)	Mob: 0171681770

Table 4: Status of Data sharing policy of the training participant's organization.

Organization	Existing	Forthcoming	Planning	No intention / Non-existent
Bangladesh Bureau of Statistics (BBS)	Data sharing Act, 2013			
Bangladesh Agricultural Research Council (BARC)				
Department of Forestry and Environmental Science, Shahjalal University of Science & Technology (SUST).				
Water Resources Planning Organization (WARPO)				
National Land Zoning Project, Ministry of Land (MoL)				
Department of Livestock Services (DLS)				
Institute of Water Modelling (IWM)				
Forest Department (FD)				
Bangladesh National Herbarium (BNH)				
Soil Resource Development Institute (SRDI)	MoU			
Arannyak Foundation				
Bangladesh Space Research and Remote Sensing Organization (SPARRSO)				
Department of Bangladesh Haor and Wetland Development				
Bangladesh Forest Research Institute (BFRI)				
Water Resources Planning Organization (WARPO)	Data Dissemination policy			
Center for Environmental and Geographic Information Services (CEGIS)				
Bangladesh Computer Council (BCC)				
GIZ				

Organization	Existing	Forthcoming	Planning	No intention / Non-existent
Survey of Bangladesh (SoB)			NSDI	
Forestry and Wood Technology discipline, Khulna University				
Nature Conservation Management				
Bangladesh Rural Advancement Committee (BRAC)				
Department of livestock services				
Department of Environment (DoE)				
Department of Agriculture Extension (DAE)				

Table 5: Features of license agreement developed from the group exercise for an imaginary data base.

License agreement features	Group 1	Group 2	Group 3	Group 4
Validity Duration	Specific project/contract	Four year.	Specific project/contract	Specific project/contract
Distribution and derived.	May be used for any purpose, and derivative works can be distributed.	May be used for any purpose, and derivative works can be distributed with restrictions.	May be used for any purpose, and derivative works can be distributed.	
Ownership	Data owner should be acknowledge, even if the data is changed for other task. The licensor will remain the owner of the data.	Data owner should be acknowledge, even if the data is changed for other task. The licensor will remain the owner of the data.	Data owner should be acknowledge, even if the data is changed for other task. The licensor will remain the owner of the data.	
Permitted use	No restriction for any type of use.	No restriction for any type of use.		Project purpose
Commercial-Non-commercial		Not for profit making		
Restricted reproduction		May not reproduce any portion without acknowledgment.	May not reproduce any portion without acknowledgment.	

## 3.2 Institutional arrangements to strengthen data exchange for the AFOLU sector

The second of the training workshop was conducted Identify entities and institutional, legal and procedural arrangements that are fundamental in the AFOLU sector.

### 3.2.1 Inaugural session

The chairperson of the inaugural session was Mr. Md. Shafiul Alam Chowdhury, Deputy Chief Conservator of Forests, Forest Management Wing, Forest Department. **Dr. Marco Boscolo**, Chief Technical Advisor, MoEF Support Project was also grace the occasion as Guest of Honour. Mr. Rakibul Hassan Mukul, Project Director, UN-REDD National Programme, Forest Department of Bangladesh presented the opening remarks. The message of the inaugural session are as follows:

- AFOLU sector data are not easily accessible in Bangladesh, because of lack of ownership of data, security concern, unwillingness or lack of culture of data sharing, and most importantly absence of permanent Institutional arrangement. So, proper data sharing policy and Institutional framework should be developed by each relevant organization to accelerate the data sharing in Bangladesh.
- Access to different climate funds relies on a proper data sharing mechanism related to climate change and GHG emission. Data sharing success depends on team effort.
- AFOLU is critical in climate change issues. It can plays role in mitigation and also it has huge contribution in the emission of GHG. As Bangladesh ratified Paris agreement, so it is mandatory to report to the UNFCCC through National Communication. Permanent institutional arrangements for sharing data to will ensure a continuous flow of data for the transparent and consistent reporting to the UNFCCC. There need an urgent capacity building regarding institutional arrangement for GHG inventory reporting.

### 3.2.2 Technical session

During this technical session one GAME played by 10 participants conducted by Dr. Marco Boscolo to explain the importance of team work. The key message of this technical session are as follows:

- Institutional function of REDD+, through different data collection, archiving, monitoring, communication process of forest department is under development. As part of this processes, forest inventories and land cover mapping is in under development. Moreover, there exist a technical working group, REDD+ steering committee, and REDD+ Cell in Bangladesh forest department. As part of the institutional arrangement, there is a proposal for new units like NFI and REDD+ unit. [Presentation title: *the prospects for improving the institutional arrangements for REDD+* by Mr. Zaheer Iqbal, Deputy Conservator of Forests, Bangladesh Forest Department]
- Third national communication is final stage. Emission considered from AFOLU sectors is CH<sub>4</sub> and N<sub>2</sub>O. Agencies and Organization involved with AFOLU sector in Bangladesh are-BBS, DAE, AIS, BARC, SRDI, FD, DoL, BLRI, International org, Business and trade association, and SoB. The challenges faced during TNC and SNC, lack of institutional set up, and unavailability of data in proper format. There is a need to build national capacity for official institutional arrangements of data sharing, because many organizations produce data related to GHG inventory, but in absence of official institutional arrangements or MoU or LOA, the data are not properly archived. DoE is taking Initiative to establish GHGI management within the DoE, and already appointed assistant director level officials as sector lead. Sensitization of high official at ministry regarding importance of institutional collaboration through organize meeting at secretary level is needed. Signing MoU between relevant agencies to establish national and institutional level MRV system for national GHG emission reporting is urgently needed. [Presentation title: Mr. Md. Ziaul Haque, Director (Air Quality Management), Department of Environment]
- If data is not protected under copyright the data owner has no legal right over the data. Copyright office, Bangladesh provide the copyright certificate. [Presentation title: *Intellectual property rights in Bangladesh* by Ms. Zohora Begum, Deputy Registrar, Copyright office, Bangladesh]
- Paris Agreement bounds its signatory countries to report regularly information on finance, capacity building, and adaptation. So, data collection, data analysis and data reporting is essential for reporting to UNFCCC. Managing these function is aim of MRV system. Institutional arrangements is the legal, procedural and institutional set-up, which is necessary to fulfil the MRV process. This is consist of four entities, such as-responsible entity, technical entity, data collector entity, and QA/QC entity. Institutional arrangements must avoid conflicts of attribution and lack of attribution, and it should be sustainable.[ Presentation title: *Institutional arrangements for MRV* by Mr. Sandro Federicci, Consultant FAO Headquarters, Rome, Italy]
- Third National Communication (TNC) is expected to submit by March, 2017. TNC is strictly adherent with the TACCC policy, because TNC is following structured approach of data collection procedure and archiving principles. Inventory archiving is done or going on using network storage, portable HDD, flash drives, CDs/DVDs. To address the data gaps, extrapolation, interpolation, surrogate data, and expert Judgement is used. Self-sustaining institutional framework, and data sharing arrangement with relevant organization, along with implementation of QA/QC plan and proper archiving of Data/Documents is essential to ensure transparent reporting. Major challenges lying with TNC are sink calculation on roadside and homestead forestry, reliable data on forest resource extraction mainly on the fuel or round wood, prevailing soil carbon stock in the Forest, and historical data on LULUCF. To overcome such challenges, institutional framework with concerned organization involving DoE and FD can accelerate



data sharing. [Presentation title: *A perspective on the development of National GHG Inventories of Bangladesh* by Mr. Utpal Bhattacharjee, Senior Consultant, NACOM]

### 3.2.3 Group Exercise

The objective of the exercise was to make participants think critically and come up with improved and robust institutional arrangements in the context of GHG inventory for the AFOLU sector. During this exercise the participants worked in groups to assign the list of actions need to be taken by the following four entities:

- Entity A: Planning and overall responsibility
- Entity B: Technical unit
- Entity C: Data collectors
- Entity D: QA for GHG inventory

The compiled results from this exercise are presented in the table 6.

Table 6: Identifies activities for different entities by different group.

	<b>Entity A:</b> Planning and overall responsibility	<b>Entity B:</b> Technical unit	<b>Entity C:</b> Data collectors	<b>Entity D:</b> QA for GHG inventory
Group 1	<ul style="list-style-type: none"> <li>• Setting data needs and identification of data gaps</li> <li>• Make all information available to stakeholders and respond to information requests</li> <li>• Official approval of GHGI and submission to the UNFCCC</li> <li>• Prioritizing improvements and allocating resources.</li> <li>• Improvement Plan</li> <li>• QA of the overall system</li> </ul>	<ul style="list-style-type: none"> <li>• QC of the overall system</li> <li>• QA of data collection</li> </ul>	<ul style="list-style-type: none"> <li>• QC for data collection</li> <li>• Setting the roles and responsibilities for data collection</li> <li>• Data collection</li> <li>• Key Category analysis</li> <li>• Recalculations for time series consistency</li> <li>• Data compilation and inventory preparation</li> </ul>	<ul style="list-style-type: none"> <li>• QA of the GHG inventory</li> <li>• QC of the GHG inventory</li> <li>• Review Process</li> </ul>
	<b>Entity A:</b> Planning and overall responsibility	<b>Entity B:</b> Technical unit	<b>Entity C:</b> Data collectors	<b>Entity D:</b> QA for GHG inventory
Group 2	<ul style="list-style-type: none"> <li>• Setting the roles and responsibilities for data collection</li> <li>• Prioritizing improvements and allocating resources.</li> <li>• Make all information available to stakeholders and respond to information requests</li> <li>• QC of the overall system</li> </ul>	<ul style="list-style-type: none"> <li>• Key Category analysis</li> <li>• Setting data needs and identification of data gaps</li> <li>• Data compilation and inventory preparation</li> <li>• Uncertainty analysis</li> <li>• Data archiving</li> </ul>	<ul style="list-style-type: none"> <li>• Data collection</li> </ul>	<ul style="list-style-type: none"> <li>• QC for data collection</li> <li>• QA of data collection</li> <li>• QA of the overall system</li> <li>• QA of the GHG inventory</li> <li>• Review process</li> </ul>

	<ul style="list-style-type: none"> <li>• Official approval of GHGI and submission to the UNFCCC</li> <li>• Improvement Plan</li> </ul>	<ul style="list-style-type: none"> <li>• Recalculations for time series consistency</li> <li>• QC for data collection</li> </ul>		
Group 3	<ul style="list-style-type: none"> <li>• Prioritizing improvements and allocating resources</li> <li>• Setting the roles and responsibilities for data collection</li> <li>• Official approval of GHGI and submission to the UNFCCC</li> <li>• Improvement Plan</li> <li>• Make all information available to stakeholders and respond to information requests</li> </ul>	<ul style="list-style-type: none"> <li>• QC of the overall system</li> <li>• Data compilation and inventory preparation</li> <li>• Data archiving</li> </ul>	<ul style="list-style-type: none"> <li>• QC for data collection</li> <li>• Data collection</li> <li>• Setting data needs and identification of data gaps</li> <li>• QA of data collection</li> </ul>	<ul style="list-style-type: none"> <li>• QA of the GHG inventory</li> <li>• QC for GHG Inventory</li> <li>• Key Category analysis</li> <li>• Uncertainty analysis</li> <li>• Recalculations for time series consistency</li> <li>• QA of the overall system</li> <li>• Review process</li> </ul>
Group 4	<ul style="list-style-type: none"> <li>• Prioritizing improvements and allocating resources</li> <li>• Improvement Plan</li> <li>• Official approval of GHGI and submission to the UNFCCC</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Make all information available to stakeholders and respond to information requests</li> <li>• Key Category analysis</li> <li>• Uncertainty analysis</li> <li>• Recalculations for time series consistency</li> <li>• Review process</li> <li>• Setting the roles and responsibilities for data collection</li> <li>• Setting data needs and identification of data gaps</li> </ul>	<ul style="list-style-type: none"> <li>• Data compilation and inventory preparation</li> <li>• Data archiving</li> <li>• Data compilation</li> </ul>	<ul style="list-style-type: none"> <li>• QA of data collection</li> <li>• QC of the overall system</li> <li>• QC for GHG inventory</li> <li>• QC for data collection</li> <li>• QA of the overall system</li> <li>• A of the GHG inventory</li> </ul>

### 3.3 Day three: GHG emission estimation tools

#### 3.3.1 Inaugural session

Mr. Nasim Aziz, UN-REDD Programme Manager, UNDP inaugurate the day three program. He remind the critical issues from the previous two days and explained the importance of the workshop. He said, challenges faced for data sharing unwillingness in sharing data, lack of culture of data sharing, and lack of inter department relationship should be overcome through the establishment of a functional institutional arrangement involving the concerned government organization.

#### 3.3.2 Technical session

The key message of this technical session are presented here.

- Mitigation is the core of UNFCCC, because ultimate objective is to stabilize GHG concentration in atmosphere. Mitigation action is a human activity intended to reduce the GHG concentration in atmosphere. Paris Agreement is a legal binding instrument adopted by UNFCCC, and as per this agreement parties are entitled to maintain and prepare NDC. To achieve aimed NDC, parties shall pursue domestic mitigation. Mitigation actions are also key features of MRV. Sustainable institutional arrangement is needed for measuring, reporting and verifying within biennial cycles. FAO MICCA is a program support for setting sustainable institutional arrangement, sustainable and accurate data collection and data analysis, accurate estimates and uncertainty analysis of GHG emission and removals. Open source excel based tool developed by the FAO for the measurement of net Carbon balance. This tool can be able to stratify land categories in unit of land according to tier 1. Apart from this tool, the IPCC GHGI and ALU software for GHG inventory is also exist. Bangladesh should developed own software for the GHG emission estimation, and FAO can provide support in this regard. [Presentation title: *climate change mitigation and tools relevant for the assessment of carbon stocks* by Mr. Sandro Federicci, Consultant FAO, Headquarters, Rome, Italy]
- Bangladesh is one of the signatories of the Paris Agreement, and as per the agreement Bangladesh is bound to implement the NDC. The NDC of Bangladesh included three sectors, power, industry and transport, and every five year a new NDC is to be submitted to UNFCCC. NDC quick start guide aimed at supporting policymakers in developing countries. It has also a reference manual. To prepare the future NDCs, Bangladesh should establish institutional arrangement to analyse national mitigation potential, apprise sectoral action, design mitigation policy, financing mitigation actions, Implement mitigation policies, and track progress. Through a permanent institutional framework, Bangladesh should further develop land cover inventory and gather data on existing AFOLU sectors. [Presentation title: *the handbook on INDC developed by Climate and Development Knowledge Network (CDKN)* by Mr. James Harries, Senior Technical Consultant – energy and climate change, Ricardo Energy & Environment presented about ]
- The quality of GHGI depends on the activity data and EF. IPCC suggested three tiers for the GHG emission estimation, with progressive complexity and accuracy. Data should be well documented and archived for the activity data and EF. The EF database is now consist of forest related data, and will be further developed with country specific factors for cropland, wetland, and settlement. [Presentation title: *the emission factor database for the Land Use, Land-Use Change and Forestry (LULUCF) sector of Bangladesh* by Ms. Anatoli Poultouchidou, UN-REDD Consultant, FAO Bangladesh]
- Tools used in TNC are, IPCC inventory software, LEAP software, ALU software, and Key category analytical tools. ALU software-a GHGI software is currently using for TNC with the technical assistance from US EPA. This software has flexibility with choice of data, and import data from remote sensing images. This software has also default option value and explicit QA steps. This software can also produce

tabular result and images for LULUCF. [Presentation title: *Tools being used for the estimation of greenhouse gases* by Mr. Md. Hasan Hasibur Rahman, Research Officer, Department of Environment]

## 4. SUMMARY OF THE WORKSHOP

The outcome of the three day training workshop are summarized below-

- Data insufficiency and unreliability affecting the data sharing processes because of lack of ownership of data, ambiguity about legal issues related with data and intellectual property rights, inappropriate data archiving and documentation, absence of data sharing policy in most of the organization.
- Data sharing infrastructure are being developed [e.g. National Architecture Framework & National Spatial Data Infrastructure (NSDI)].
- Copyright office recommend the use of MoU to facilitate data sharing.
- Data documentation and archiving processes of Bangladesh Delta Plan 2100 as well as National land zoning project is a good example of Data documentation and archiving from Bangladesh perspective.
- Some data sharing platforms like Bangladesh open government data sharing platform, Bangladesh Geographical System Platform (BGISP), and GEODASH are in the processes of development.
- GEODASH is a good example to present the data ownership
- Most of the government organizations related have no data sharing policy.
- Climate Change Department in DoE is responsible for the preparation of BURs, including GHGs, and NCs.
- Lack of a complete permanent institutional framework for data collection, data analysis and data submission to UNFCCC.
- Submission of information to UNFCCC is seen as a pre-requisite for accessing to climate finance.
- Government Departments have mandate to share data. However, there are no rule for data sharing among Ministries (Lack of official institutional arrangements for data sharing).
- Common tools for GHG are IPCC inventory software and ALU software.
- FAO has developed EX-ACT tool for measuring the net Carbon balance.
- NDC of Bangladesh did not address the GHG emission mitigation potential in agriculture and forestry.
- An EF database is developed containing 1,142 EFs for AFOLU.
- DoE is using ALU software with the assistance from USEPA for the GHG emission estimation for the TNC, except for the LULUCF sector.

## 5. RECOMMENDATIONS FOR NEXT STEPS

The recommendation for the next step are presented here-

- Strengthen GHG inventory capacity in MoEF & DOE with interconnections with relevant experts in other relevant ministries / organizations / agencies/ departments.
- Identify focal points for data sharing in every organization mentioned in the table 3.
- Secretaries of the relevant ministries need to provide clear instructions on data sharing to the DGs of concerned organization related with AFOLU sector.
- Establish coordination among administrations (Cabinet Division).
- Establish procedure, and templates, for data sharing, where needed.
- Coordinated IT support.
- Support on intellectual property rights from Copyright office when needed.

- Raising awareness in high officials at Ministry level on needs of data sharing an institutional arrangements
- Inter-departmental meetings on institutional arrangements for data sharing on specific purposes e.g. GHG inventory preparation
- Support documentation and data archiving in specific institutions

## APPENDIX 1. AGENDA

<b>Venue: Conference room (Ground Floor) of Bangladesh Bureau of Statistics (BBS)</b>	
<b>6 December, 2016</b>	
<b>Data Sharing</b>	
<b>Inaugural Session</b>	
9.00 – 9.30	<b>Registration</b>
9.30 – 9.35	Welcome Note and introduction to the workshop: <b>Mr. Rakibul Hassan Mukul</b> , Project Director, UN-REDD National Programme, Forest Department
9.35 – 9.45	Speech by Guest of Honour : <b>Mr. David Doolan</b> , Deputy FAO Representative in Bangladesh
9.45 – 9.55	Speech by the Chief Guest: <b>Dr. A. Atiq Rahman</b> , Executive Director, Bangladesh Centre for Advanced Studies (BCAS)
9.55 – 10.05	Remarks by the Chairperson : <b>Mr. Abani Bhushan Thakur</b> , Deputy Chief Conservator of Forests, Forest Department
10.05– 10.20	<b>Tea break</b>
<b>Technical Session</b>	
10.20 – 10.35	The importance of data availability, reliability and data sharing: <b>Mr. Md. Shaheduzzaman</b> , Project Advisor-cum-National Team Leader, FAO
10.35 -11.00	Overview of data sharing mechanisms and summary of questionnaire results on data sharing , <b>Mr. Nazmul Islam and Ms. Anatoli Poultouchidou</b> , UN-REDD Consultants, FAO
11.00 – 11.30	National Enterprise Architecture and Interoperability Framework initiative, <b>Mr. Tarique M Barkatullah</b> , (Deputy Project Director) and Mr. Tanimul Bari (Technical Specialist), Leveraging ICT for Growth, Employment and Governance Project, Bangladesh Computer Council, Ministry of ICT.
11.30 – 12.00	Bangladesh Geographical System Platform (BGISP): <b>Mr. Md. Zahidul Haque</b> , Project Director GIS project, Bangladesh Bureau of Statistics
12.00 – 12.30	National Spatial data Infrastructure (NSDI) for Bangladesh: <b>Mr. Sayed Mohammad Masum</b> , Assistant Director (In Charge, GIS Section), Survey of Bangladesh.
12.30 – 13.30	<b>Lunch and Prayer Break</b>
13.30 – 14.00	Data sharing and archiving: Bangladesh Delta Plan 2100. <b>Mr. Giasuddin Choudhury</b> , Deputy Team Leader, Bangladesh Delta Plan 2100, General Economics Division, Bangladesh Planning Commission
14.00 – 14.30	National Land Zoning Project, <b>Mr. Md. Mahbubur Rahman</b> , GIS & Remote Sensing Specialist, National Land Zoning Project, Ministry of Land
14.30 – 15.00	GeoDASH: Geospatial Data Sharing Platform, <b>Mr. Ahasanul Hoque</b> , GIS & Data management Specialist, FAO
15.00 – 15.30	Open government data sharing platform, <b>Mr. Manik Elahi</b> , IT Manager, a2i Prime Minister's Office.
15.30 – 15.45	<b>Tea break</b>
<b>Group Exercise</b>	
15.45 – 16.45	Practical exercise with a focus on data sharing Facilitators: <b>Ms. Anatoli Poultouchidou and Mr. Nazmul Islam</b> , UN-REDD Consultant, FAO
16.45 – 17.15	Presentation of the results from the group exercise
17.15 – 17.30	<b>Closing remarks: Mr. Rakibul Hassan Mukul</b> , Project Director, UN-REDD National Programme, Forest Department
<b>Refreshment and End of the day session</b>	
<b>7 December, 2016</b>	

<b>Institutional arrangements</b>	
<b>Inaugural Session</b>	
9.00 – 9.05	Opening remarks by <b>Mr. Rakibul Hassan Mukul</b> , Project Director, UN-REDD National Programme, Forest Department
9.05 – 9.10	Remarks by Guest of Honour: <b>Dr. Marco Boscolo</b> , Chief Technical Advisor, MoEF Support Project
9.10 – 9.15	Remarks by Guest of Honour: <b>Mr. Md. Baitul Amin Bhuiyan</b> , Deputy Director General, Bangladesh Bureau of Statistics
9.15 – 9.25	Remarks by Chief Guest: <b>Agriculturist Mr. Md. Hamidur Rahman</b> Director General, Department of Agricultural Extension
9.25 – 9.35	Remarks by the Chairperson: <b>Mr. Md. Shafiul Alam Chowdhury</b> , Deputy Chief Conservator of Forests, Forest Management Wing, Forest Department
<b>Technical Session</b>	
9.35 – 10.05	Intellectual property rights in Bangladesh, <b>Ms. Zohora Begum</b> , Deputy Registrar, Copyright office, Bangladesh.
10.05 – 10.20	<b>Tea Break</b>
10.20 – 11.00	Institutional arrangements for MRV: <b>Mr. Sandro Federicci</b> , Consultant FAO Headquarters, Rome, Italy
11.00 – 11.30	A perspective on the development of National GHG Inventories of Bangladesh: <b>Mr. Utpal Bhattacharjee</b> , Senior Consultant, NACOM
11.30 – 12.00	The prospects for improving the institutional arrangements for the AFOLU sector, <b>Mr. Md. Ziaul Haque</b> , Director (Air Quality Management), Department of Environment
12.00 – 12.30	The prospects for improving the institutional arrangements for REDD+: <b>Mr. Zaheer Iqbal</b> , Deputy Conservator of Forests, Bangladesh Forest Department
12.30 – 13.30	<b>Lunch and Prayer Break</b>
13.30 – 14.30	Practical exercise with a focus on Institutional arrangements: Recommendation for establishing robust institutional capacity Facilitators: <b>Ms. Anatoli Poultouchidou</b> and <b>Mr. Nazmul Islam</b> , UN-REDD Consultant, FAO
14.30 – 15.30	Presentation of the results from the practical exercise
15.30 – 16.00	General discussion and review of the day
16.00- 16.15	Closing remarks by <b>Mr. Rakibul Hassan Mukul</b> , Project Director, UN-REDD National Programme, Forest Department
<b>Refreshment and End of the Day session</b>	
<b>8 December, 2016</b>	
<b>Tools for estimating emissions and removals of GHGs from the AFOLU sector</b>	
<b>Inaugural Session</b>	
9.05 – 9.10	Opening remarks by <b>Mr. Nasim Aziz</b> , UN-REDD Programme Manager, UNDP
<b>Technical Session</b>	
9.10 – 10.10	Climate change mitigation and tools relevant for the assessment of carbon stocks: <b>Mr. Sandro Federicci</b> , Consultant FAO, Headquarters, Rome, Italy
10.10 – 10.25	<b>Tea break</b>
10.25 – 10.55	Presentation on the handbook on INDC, Climate and Development Knowledge Network (CDKN), <b>Mr. James Harries</b> , Senior Technical Consultant – energy and climate change, Ricardo Energy & Environment
10.55 – 11.25	The emission factor database for the Land Use, Land-Use Change and Forestry (LULUCF) sector of Bangladesh, <b>Ms. Anatoli Poultouchidou</b> , UN-REDD Consultant, FAO Bangladesh
11.25 – 11.55	Tools being used for the estimation of greenhouse gases, <b>Mr. Md. Hasan Hasibur Rahman</b> , Research Officer, Department of Environment
11.55 – 12.25	Roundtable/ discussion
<b>Outcome of the Workshop</b>	

12.25 – 13.25	<b>Lunch and Prayer Break</b>
13.25 – 14.00	Presentation on the outcome of the Data sharing
14.00 – 14.30	Presentation on the outcome of Institutional arrangement
14.30 – 15.00	Presentation on the outcome of the tools to estimate emission reductions
15.00 – 15.15	Closing Remarks by <b>Mr. Matieu Henry</b> , Chief Technical Advisor, FAO
15.15 – 15.30	Speech by Guest of Honour : <b>Mr. David Doolan</b> , Deputy FAO Representative in Bangladesh
15.30 – 15.45	Speech by the Chief Guest: <b>Mr. Md. Yunus Ali</b> , Chief Conservator of Forests, Forest Department
15.45 – 15.55	Remarks by the Chairperson: <b>Mr. Md. Shafiu Alam Chowdhury</b> , Director General, Bangladesh Bureau of Statistics
<b>Refreshment and End of the Workshop</b>	

## APPENDIX 2. PARTICIPANT LIST

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### APPENDIX 3. EVALUATION

	Total Respondent=12	Frequency	%
1	Gender		
	Male	7	58%
	Female	5	42%
2	Organization		
	Bangladesh Institute of Development Studies(BIDS)		
	GIZ		
	Water Resources Planning Organization (WARPO)		
	Arannayk Foundation		
	Department of Fisheries		
	Bangladesh Bureau of Statistics		
	SRDI		
	ACI		
	Bangladesh Forest Department		
	Bangladesh Computer Council		
3	Have you ever participated in a training workshop on		
	Data sharing	11	92%
	Institutional arrangements	6	50%
	GHG inventory	6	50%
4	How relevant is for your organization to improve data sharing and institutional arrangements?		
	No relevant	0	0%
	Slightly relevant	1	8%
	Relevant	8	67%
	Most relevant	3	25%
5	What are the most important data from other institutions that would help your organization to perform your duties?		
	Not Applicable		

6	The training workshop materials provided were adequate and useful.		
	Strongly agree	1	8%
	Agree	9	75%
	Neutral	1	8%
	Disagree	0	0%
	Strongly disagree	0	0%
7	The resource person presented information in a way that I could understand and was easy to follow.		
	Strongly agree	0	0%
	Agree	0	0%
	Neutral	0	0%
	Disagree	0	0%
	Strongly disagree	0	0%
8	Would you recommend other organizations and/or participants for the next workshop/activity on GHG inventory for AFOLU?		
	Yes		
	Some of the Key institutes (BMD, BWDB) were absent in the workshop. In next workshop those organization should be invited.		
	BADC, DAE, SPARRSO, City Corporation (s), DPHE, BMDA, BRTA, BIWTA, Ministry of Industries, Bangladesh Railways, UDD, GSB		
	DoF, BARC		
	Yes		
	Forest Department		
	Department of Forestry(DF), Department of Environment(DOE)		
	Every donor agency should participate		
	Innovision Consulting, Consiglieri Pvt. Limited		
	LGED, BMD		
	yes		
9	What would you recommend as next steps to facilitate data sharing?		
	Have to communicate of the relevant organizations		
	A common understanding and common strategy for data sharing among the organisation and for projects.		
	need arrangement for logical (MoU etc.) and physical data sharing infrastructure		
	Developing an effective platform through facilitating quarterly meeting among relevant organizations		
	Data Sharing agreement		
	To Arrange at three workshop/Seminar/Training Programe		
	To conduct at least four workshop and Training program/Seminars		
	creation of a platform for structured data sharing and regular update meetings		
	Creation of a working committee		

	To develop a strong MoU within the Ministries and the relevant Departments.		
	To follow the Bangladesh Network Enterprise Architecture (BNEA)		
10	What would you recommend as next steps to build robust institutional arrangements?		
	MoU		
	Coordination and MOU between different organizations.		
	meeting among data holding agencies for that issue		
	Promoting culture of sharing information through sensitization and inter-ministerial and interdepartmental cohesion. Government good will of making inter-ministerial and interdepartmental linkage is necessary in that case.		
	Institutional Linkage		
	Institutional Capacity building is needed		
	Institutional capacity buildings are needed urgent to build robust institutional arrangements		
	Capacity diagnostic and action accordingly		
	draft a common agreement format		
	Capacity building, creating & operationalise new relevant unit.		
	To compile the e-Services Applications will be hosted by Service at Data center		
11	Which message would you like to bring to the policy makers to improve data sharing for the AFOLU sector?		
	There is lack of data but we must have to share the available data		
	"Data for research and decision making should be available with in legal framework"		
	need inter agency cooperation		
	Sharing the data means helping other to have right decision & sharing data means reducing cost of gathering information		
	More realistic and adequate data sharing		
	Intermenstrual Meeting / MoU /LoA		
	It is a special nitty-gritty to protect our forestry, environment and sustainable development for the country.		
	Open data policy		
	Understand the need of the pvt sector more		
	Relevant Department must include a Data Sharing Agreement as a component of Policy making.		
	To follow the Bangladesh Network Enterprise Architecture (BNEA)		
12	Which message would you like to bring to the policy makers to improve institutional arrangements for the AFOLU sector?		
	There is lack of data but we must have to share the available data of AFOLU sector		
	A built in data sharing clause should be included in knowledge management platform.		
	need inter agency cooperation		
	Team effort can bring better result than individual hard work and in a team no one need to confined anything for his own credit.		

	Institutional arrangement and legal framework		
	Inter-ministerial Meeting / MoU /LoA		
	Corruption reduction		
	To involve the private sector more		
	Duties and responsibilities of the relevant unit must include in the Policy for the AFOLU sector.		
	To compile the e-Services Applications will be hosted by Service at Data center		
13	Any other comment?		
	I got many important information on AFOLU sector. I like to work on environmental pollution and I did my thesis on AIR pollution and GHGs estimation using MIR.		
	Short (Not a three day) length of workshop, more participatory group exercise.		
	WARPO has updated a report on 'Data Inventory and Need Assessment for NWRD and ICRD' on October 2015 and shared with different stakeholders.		
	This workshop is very fruitful and lesson learning.		
	Foreign Training & Study tours are needed for the relevant field		
	Foreign study tours and financial capacity building is needed for development in this sector		
	The workshop was not up to the mark regarding time management and facilitation		