



Proceedings of the national consultation on forest boundary digitization



Bangladesh Forest Department
12 April 2016



The Forest Department of Bangladesh leads actions to improve forest management and conservation, adopting forward thinking, innovative approaches in its management of approximately 1.55 million hectares of land across the country.

In 2015, the Forest Department began a process to establish a National Forest Inventory and Satellite Land Monitoring System for improved forest and natural resource management. The process supports national objectives related to climate change mitigation and provides information in support of the UN-REDD programme aimed at Reducing Emissions from Deforestation and Forest Degradation (REDD+). The process also addresses domestic information needs and supports national policy processes related to forests and the multitude of interconnected human and environmental systems that forests support.

The activities implemented under the Bangladesh Forest Inventory process are collaboration between several national and international institutions and stakeholders. National partners from multiple government departments and agencies assist in providing a nationally coordinated approach to land management. International partners, including the United States Agency for International Development (USAID) and the Food and Agriculture Organization of the United Nations (FAO) are supporting the development of technical and financial resources that will assist in institutionalizing the process.

The results will allow the Forest Department to provide regular, updated information about the status of trees and forests for a multitude of purposes including for assessment of role of trees for firewood, medicines, timber, and climate change mitigation.

CONTACTS:

Md. Zaheer Iqbal

National Project Coordinator
Bangladesh Forest Department
Email: z.iqbal60@gmail.com

Matieu Henry

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

Suggested Citation: **Chakma, N., Udit, T. S. & Akhter, M.** 2016. Proceedings of the National Consultation on Forest Boundary Digitization. 12 April 2016, Dhaka, Bangladesh Forest Department, Food and Agriculture Organization of the United Nations.

Disclaimer

This report is designed to reflect the activities and progress related to the project GCP/GD/058/USAID “Strengthening National Forest Inventory and Satellite Forest Monitoring System in support of REDD+ in Bangladesh”. This report is not authoritative information sources – it does not reflect the official position of the supporting international agencies including USAID or FAO and should not be used for official purposes. Should readers find any errors in the document or would like to provide comments for improving its quality they are encouraged to contact one of above contacts.



Executive Summary

Forest boundary plays important role for monitoring and management of forest and forest resources. Although forests cover about 11% of total land in Bangladesh, however there is no proper forest boundary particularly digital forest boundary. For proper management and implementation of REDD+, up to date forest land boundary and forest cover are required. Though GIS layer of the forest cover map has been updated using remote sensing under several project, the GIS layer of forest land boundary is not updated. With a view to digitization of forest boundary, two pilot study have been undertaken at Banstail Range of Tangail Forest Division implemented by CEGIS and Mirsharai Range of Chittagong Coastal forest division implemented by Datex. The primary objective were to develop methodology for GIS layer preparation and identify gaps and problems related to digital forest land boundary delineation.

To disseminate the pilot study findings, a day long consultation workshop has been arranged at Bangladesh Bureau of Statistics (BBS) ground floor on 12th April 12, 2016. A total of 46 participants (39 Male and 7 female) were attended to discuss the digital forest boundary methodology expert from different institutions, academic and research organization. Various important issues have been discussed particularly implications of CS, RS and BS sheet map for digitization. Both organizations found some problems to digitization due to low of quality of image and lack of original map but emphasized that forest boundary is urgent need for Bangladesh for proper forest management and monitoring. Geo referencing and edge matching were used for digitization of forest boundary. Forest boundary accuracy is another major factor to delineate the forest boundary. Majority of the participants recommended to coordinate with DLRS for forest digital boundary map and gazette and non-gazette plantation/ plantation journal history need to be considered in case of coastal forest regions.

The materials used for the national consultation have been shared with the participants. The evaluation of the national consultation reveals that positional accuracy and validation are very crucial for the forest land boundary digitization. In case of coastal afforestation review of plantation history is very important to cover exact forest coastal land boundary.

Table of Contents

Executive Summary.....	4
Table of Contents.....	5
1. Introduction	6
2. Inauguration Session.....	8
3. Overview of the presentation.....	10
3.1 Pilot study for the development of methodology to support the national forest boundary digitization, Banstail Range, Tangail Forest Division by Nasrat Jahan from CEGIS.....	11
3.2 Pilot study for the development of methodology to support the national forest boundary digitization, Mirsharai Range Chittagong Coastal Forest Division by Mr. Masud Hasan Chowdhury, Datex.....	12
4. Group Discussions.....	13
5. Recommendation and next steps	15
Appendix 1: agenda of the national consultation.....	16
Appendix 2: list of participants	17
Appendix 3: Evaluation of the consultation.....	20

Acronyms

AF	Arannayk Foundation
BBS	Bangladesh Bureau of Statistics
BFD	Bangladesh Forest Department
BS	Bangladesh Survey
CEGIS	Centre for Environmental and Geographic Information Services
CHT	Chittagong Hill Tracts
CS	Cadastral Survey
DFO	Divisional Forest Officer
DLRS	Department of Land Records and Survey
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographic Information System
GPS	Global Positioning System
Mha	Million hectare
RCC	Reinforced Concrete Column
REDD+	Reducing emissions from deforestation and the role of conservation, Sustainable Management of forests and enhancement of forest carbon stocks in developing countries.
RIMS	Resources Information Management System
RS	Revisional Survey
RTK	Real Time Kinematic
UN	United Nations

1. Introduction

The Bangladesh Forest Department (BFD) manages about 1.55 Mha of forest land which includes hill, Sal, swamp and mangrove forests that covers about 11% of the total land area (BFD, 2016). Several gazette notifications of the government, Cadastral Survey (CS), Revisional survey (RS), Bangladesh Survey (BS) sheet maps and some other base maps for the forest area are available in the head office, division office, range office and beat offices of forest department. However, there is no proper demarcation for forest land in the field for any forest type's particular digital forest boundary. In collaboration between FAO and BFD, CEGIS, and Datex, two pilot studies have been designed to develop and test a methodology for preparation of GIS layer of forest land boundary. The pilot areas are Banstail Range of Tangail Forest division (Figure 1) and Mirsharai range of Chittagong coastal forest division (Figure 2).

Table 1: Available documentation for the forest boundary delimitation

Available documents	Description
Gazette notifications (Forest Department)	<ul style="list-style-type: none"> - Chittagong hills ; by 1871, 5670 square miles (out of a total of 6882, square miles within the district) had been gazetted as government forest. - Forest Act 1929, an Act to consolidate the law relating to forests, the transit of forest produce and the duty leviable on timber and other forest-produce. - Forest policy 1979 - Attia forest act 1982, an ordinance to make provision for the protection of the Attia Forest in the district of Decca and Tangail - National Forest Policy 1994 - Three wildlife sanctuaries (the Sundarbans East, West and South, totaling 139,698 ha) were gazette in 1996. - Social Forestry Rules 2004
Cadastral Survey (Land Ministry)	<ul style="list-style-type: none"> - The first Cadastral Survey was carried out in 1887 and finished in 1940. It has been used as records of rights.
SA, RS, BS and Dayra garip	<ul style="list-style-type: none"> - Map produced during State acquisition Survey, Revisional survey, Bangladesh Land Survey, Dayra Garip as of the Gazette notifications
Bangladesh Forest assessments	<ul style="list-style-type: none"> - Sundarban compartment maps found in Cartis working plan in 1913 - Sundarban, Kassalong, Raingkhiang and Sangu-Matamuhuri reserve forest map prepared in 1960s - Sundarban forest species class map and inventory conducted in 1963, 1983 and 1997 - Other sub national level maps of Chittagong, Cox'sbazar, Sylhet forest area prepared in 1983, 1997 and 2013 - First national level tree cover map prepared in 2007 (NFA)

To disseminate the pilot study findings a national consultation workshop has been held at BBS conference room (ground floor) on 12th April 2016. The overall objectives of the workshop are

(1) to show gaps and problems identified from the piloting for the delineation of forest boundary before planning for the whole country, (2) finalize the forest boundary delineation methodology to follow for the whole country and (3) to share the draft manual for boundary delineation for comments. The consultation workshop has been held into three sessions based on agenda of the workshop ([Appendix 1: agenda of the national consultation](#)): Opening/inauguration session, (2) Presentation of the piloting and (3) Finalisation of the methodology. Mr. Mesbah ul Alam, Secretary, Ministry of Land was present as a Chief Guest and Mr. Mohammed Shafiu Alam Chowdhury, Deputy Chief Conservator of Forests, Forest Management wing, Forest Department presided over the workshop. Various methodological issues have been discussed and listed regarding the forest boundary digitization which will help for successful execution of the programme. A total 46 participants (Male-39, Female-07) were attended at workshop including Forest Department officials, FAO representatives, CEGIS, Datex, university professors and many others professionals ([Appendix 2: list of participants](#)).



Figure 1: Geographic location of the pilot study of Tangail for the development of the forest boundary delimitation



Figure 2: Geographic location of the pilot study of Mirsharai range, Chittagong for the development of the forest boundary delimitation

2. Inauguration Session

At the beginning, Mariam Akhter (FAO) welcomed all the participants to attend the workshop and introduced Chief Guest, Special Guest and Chair of the programme as well as requested to provide the participants name and respective organization before going to formal discussion and presentation.

Mr. Md. Mozaharul Islam, Conservator of Forest and National Focal Point UN-REDD Forest Department addressed the welcome speech at the programme. He thanked all the participants to join for successful completion as well as gratitude to Chief Guest, Chair and Special Guest to spend some time with us. He said the forest boundary is very much important to monitor forest tree species as we don't know exact forest covers and boundary. The project will help legal based forest boundary. He also mentioned that to address the forest boundary two pilot studies have been implementing at the Banstail Range, Tangail Forest Division and Mirsharai Range, Chittagong Coastal Forest Division, Chittagong. Further he requested to all participants to help preparing appropriate, affordable and usable forest boundary map by giving valuable comments and suggestions. He also emphasized to coordinate with DLRS (Department of Land Records and Survey) for digitization of forest boundary.

Following the discussion, **Mr. Zaheer Iqbal**, Deputy Conservator of Forests, RIMS Unit, FD presented "Current status of the digital forest boundary". He discussed previous survey and inventory done in Bangladesh particularly CHT in 1960, Cox's bazar in 1997, Sylhet in 2011, Sundarbans in 1963, 1983 and 1998. He mentioned that the last national forest inventory was done in 2007 but no exact digital boundary. He shared latest Sundarban mangroves, Sal forest and Kaptai national park information. 200 RCC pillar were demarcated at the Kaptai National Park in 1942 but some are flooded due to establishment of Kaptai dam in 1960. He also emphasized to digitization of forest boundary to reduce pressure over the land and forest resources. He mentioned some challenges for digitization of CS/RS/BS sheet map for example, fragmented, encroachment, non-existence of pillars, inadequate support from local administration, capacity of Forest Department and quality of CS/RS sheet.

Mr. Farid Uddin Ahmed, Executive Director of Arannayk Foundation, thanked to all distinguished participants especially Chair, Chief Guest and Special Guest and expressed gratitude to organizer to give me chance to say something as a special guest. He shared different experiences regarding forest activities as AF has been implementing several projects across the country. In 2014 his organization done a GIS/GPS survey at Chunuti Wildlife Sanctuary and found that some areas have been encroached, however, on the other hand tree coverage/forest improvement found in some areas compared to last 20 years. He also discussed Chittagong Hill Tracts experiences regarding forest management locally called Village Common Forests (VCF). The forests have been regulated by the Mouza Headman through 1900

Hill Tracts regulations. This is the unique example of forest conservation and management, but there are no clear demarcation/boundary of each specific forest locations. He gave an example that Mouza Headman says the area of the VSF would be 100 acres, but when measured through GPS was 800 acres. So, this project is very much important and good initiatives to address the problems.

Mr. Mesbah ul Alam, Chief Guest of the workshop expressed sincere gratitude to organizer being a Chief Guest and said this programme is very much related to land ministry. The forest has been fragmented to various forms for example encroachment. He said that 1971 the total population was 70 million now is 160 million. He also mentioned some reasons for conversion of forestlands into different perspectives like industry. Record correction is also very important for forest boundary survey, without mitigation of land ownership disputes it may hamper the initiative. Therefore he suggested to communicate the land ministry, Department of Land Records and Survey for land delineation. He mentioned that 80% disputes are related to land in Bangladesh. He also requested to all participants to comment and provide suggestion for the successful implementation of the project. He also wished success for the project and always ready to help for suggestion and coordination, as he was also Secretary of Forest and Environment Ministry.

The Chair of the consultation workshop Mr. Mohammed Shafiul Alam Chowdhury, Deputy Chief Conservator of Forest expressed to the distinguish participants especially Chief Guest to attend the workshop. He thanked all for providing valuable comments. He mentioned that forest cover about 11% of total land in Bangladesh but has no boundary map, no detailed information as well as no proper legal recognition. He requested everyone to provide valuable suggestion for the successful execution of forest boundary.

3. Overview of the presentation

3.1 Pilot study for the development of methodology to support the national forest boundary digitization, Banstail Range, Tangail Forest Division by Nasrat Jahan from CEGIS

He discussed pilot study of forest boundary digitization at Banstail range at Mirsarai-Shakhupir. The study has been carried out collection of 95 CS sheet maps of 30 Mouzas (hardcopy maps) from Directorate of Land Records and Survey.

The following steps were followed by CEGIS to undertake this study: (1) collection of the map for the Mouza, (2) scanning, (3) edge matching and georeferencing- Accuracy (4) Forest land boundary.

The software used for the analysis was ArcGIS. Geo-referencing and edge matching were used for the digitization of forest boundary. The following challenges were discussed: (1) accuracy of the geographic location using of RTK and GPS point, (2) edge matching, topological error, adjacent polygons and overlap. BS maps was used for Geo referencing. In case of geo referencing, BS Mouza shape file, RTK point, DGPS corrected point, attribute files, gazette notified forest land (reserve and protected forests). Positional Accuracy assessment was also done at 165 sq.km.

Discussions

Forest boundary digitization is a good initiative to mark the forest land cover, conflict mitigation as well as legal stand law to justify forest land through court. It will be a real forest policies where CS and RS are scattered. It will also help for legal ownership for CS. One participant from FD mentioned that there is no need to separate explanation between reserve and protected forest. The land has already been processing to include as reserve forest. Both BS and RS were used as references for the pilot studies. It was observed that 86 meter errors were found from CS. So accuracy is the main factor for digitization of forest boundary. Topological error plays important role dealing with the forest boundary. Shifting of forests is the indication for encroachment. Desk review is required to identify the gap And to compare the study methodologies. It will help us to understand the edge matching clearly. As forest department has low capacity to do but the total system will help for replication. There are no DLRS members so it should be included DLRS to collect original map as well as legal rights. RTK point will be good for accuracy of the forest boundary.

3.2 Pilot study for the development of methodology to support the national forest boundary digitization, Mirsharai Range Chittagong Coastal Forest Division by Mr. Masud Hasan Chowdhury, Datex

He discussed the pilot study is going on and have no appropriate findings to compare or final decision making. The study has been carried out at Mirsharai range. Both CS and RS map were used for digitization process. They covered 35 mouza maps in the Missharai range for the forest boundary digitization. Before digitization process, the mouza maps were collected from DFO office from Chittagong forest range then photocopied and converted JPG image in resolution 300 dpi at scale 100% (1:1). ArcGIS was used for digitization process.

Three type of features were digitized in different layers of the mouza map sheets mainly line, point and annotation. Three types of ESRI shape files were found after attributing database format for digitized mounza-line, point and polygons.

The following challenges were mentioned:

- (1) Dag Nos. illegible, even following numbering sequence offered little help
- (2) Some dag numbers were very strange, like out of blue
- (3) Torn and worn out sheets gave poor plot boundary along the tear and wear lines, had to be guessed through judgement.

To be completed as like CEGIS, Datex also applied geo referencing for boundary map digitization. Firstly Datex took map from google earth then took ground control point to RTK GPS point. Finally digitalized mouza maps are being transferred geo referencing. For taking good and clearly plot mosaic map should be collected from the DLRS office, then edge matching will be good for digitization. Validation of mouza map will be done by a joint team of client and consultants. However it will take time, finance and finalization of appropriate methodology.

Discussions

Forest land is pictured by gazette notification especially Sal forest. In case of coastal regions plantation not only gazette, plantation history need to be considered while forest boundary digitization. In case of coastal areas validation would be a problem after 100 years. It has been observed in the Chunati range, some areas have greater portion of forests and in some areas significantly forest degradations were found than 20 years ago. the collected map and scanned for boundary digitization but coastal region is very difficult to locate forest, house due to high tide and other environmental factors. Review of plantation history of Mirsharai or gazette notification for Mirsharai range for better understanding. Land status is also very important. Land boundary can be understood through gazette notification, in case of coastal region both

gazette and plantation history needs to be considered for proper boundary digitization. It will be very helpful to get latest map from DLRS for Forest boundary accuracy.

4. Group Discussions

Five questions were supplied to exercise the group work. Group findings revealed that forest department is responsible for collecting division wise forest lands managed by forest department as well as collecting CS sheet from the DLRS office.

Considering the two presentations mentioned above and the results from the group discussion, we can note the following methodological differences between the case studies one and two.

Case study	Common methodological approach	Divergence	Suggestions
Banstail Range, Tangail Forest Division by Nasrat Jahan from CEGIS	<ul style="list-style-type: none"> • CS hardcopy mouza map • Scanned mouza map • Shape file of individual mouza sheet • Geo-referenced mouza shape file 	<ul style="list-style-type: none"> • Option1 - edge matching and geo-referencing (BBS mouza, RTK point, DGPS corrected image) • Option 2 -Geo-referencing and edge matching (RTK point, DGPS corrected image) • Positional accuracy assessment 	<ul style="list-style-type: none"> • Option 2a shows high positional accuracy 6 meter but procedure will be costly and time consuming • Option may be 2b (Geo-referencing individual sheets using DGPS corrected high resolution satellite image) and will be cost effective and less time consuming.
Mirsharai Range Chittagong Coastal Forest Division by Mr. Masud Hasan Chowdhury, Datex	<ul style="list-style-type: none"> • Collection Mouza map from different forest offices • Scanning the mouza map 	<ul style="list-style-type: none"> • Google Earth image for geo-referencing the digitalized mouza maps • Ground Control 	The validation process will be done by a joint team of Client & Consultant.

	<ul style="list-style-type: none"> • Nomenclature of mouza map sheet image • Used on screen digitization method for digitization of mouza map sheets 	<ul style="list-style-type: none"> Point for precision • RTK-GPS for transformation of digitized mouza maps to geo-referenced image reference and mosaicking of mouza map • Engineering and GIS based Auto CAD map and ArcGIS software for digitization and database • Three types of features were digitized in different layers <ul style="list-style-type: none"> - line - Point -Annotation/Text 	
--	--	--	--

5. Recommendation and next steps

The consultation workshop explored insights and importance of forest boundary delineation. It is crucial to know where the forest land is for better forest management and policy decision making. Methodology for boundary digitization is under development. Draft methodology has been shared with the participants during the consultation and would be shared again after finalization. Several next steps were identified in the consultation. They are as follows:

- Review the nationally and internationally available methodologies for boundary digitization
- methodology will be discussed in a small group
- Joint meeting with DLRS, SoB, Land Zoning Project of Land Ministry to involve them in the forest boundary delineation process
- ACCF establishment Unit, RIMS Unit and FAO will work together to identify and list the respective forest divisions which belongs the Forest land
- RIMS Unit will issue a letter to the respective divisions for collecting the mauza names and sheet numbers. Based on which CCF will send a request letter to DG, DLRS for obtaining the original sheet maps for boundary digitization
- avoid the photocopy maps for scanning and digitization
- Look for the provision of using the high accuracy RTK GPS to increase the accuracy
- plantation journals, history of the plantations, newly accreted char lands as well as gazette notifications need to be considered for the delineation of forest land boundary in coastal areas
- FD officials of respective forest division should/will assist the boundary validation process

Appendix 1: agenda of the national consultation

Date	Topic	Speaker/facilitator
Morning	Session 1: Opening session	
9.00-9.30	Registration	
9.30-9.35	Welcome address	Mr. Md. Mozaharul Islam, Conservator Forests and National Focal Points UN-REDD, Forest Department
9.35-9.45	Current status of the digital forest boundary	Mr. Zaheer Iqbal, Deputy Conservator of Forests, RIMS Unit, Forest Department
9.45-9.55	Special Guest	Mr. Farid Uddin Ahmed, Executive Director Arannayk Foundation
9.55-10.05	Chief Guest	Mr. Mesbah ul Alam Secretary Ministry of Land
10.05-10.15	Address by the chair	Mr. Mohammed Shafiul Alam Chowdhury, Deputy Chief Conservator of Forests, Forest Management Wing, Forest Department
10.15-10.30	Tea Break	
	Session 2: Presentation of the piloting	
10.30 AM	Presentation 1: 1 st case study: pilot study for the development of methodology to support the national forest boundary digitization, Banstail Range, Tangail Forest Division	Mr. Shaidul Islam, CEGIS/Nasrat Jahan
11.00 AM	Presentation 2: 2 nd case study: pilot study for the development of methodology to support the national forest boundary digitization, Mirsharai Range, Chittagong Coastal Forest Division, Chittagong	Mr. Masud Hasn Chowdhury, Datex
	Session 3: Finalisation of the Methodology	
12.00	Group Discussion	
1.30	Closing and Lunch	

Appendix 2: list of participants

	Name	Organization	Mobile number	Email
	Mesbah ul Alam	Secretary, Ministry of Land	01974747676	
	Md. Shafiul Alam Chowdhury	DCCF, FD	0189323000	msalamchow@gmail.com
	Zahir Uddin Ahmed	CF, FD	01711581429	zahirfd84@yahoo.com
	Dr. M. Al. Amin	Professor, CU	01819820184	Prof.alamin@yahoo.com
	Md. Mozaharul Islam	CF, BFD	0171300289	mazhar.raj@gmail.com
	Mr. Faruque Hossain	DCCF, BFD	01731-928106	faruque_hossain@yahoo.com
	Mohammed Shahidul Islam	CEGIS	01715038209	gislan@agisbd.com
	Premanando Debnath	CEGIS	01737760017	premlogeo@gmail.com
	Shaleha Khatun	BBS	01716596194	shaleha.du@gmail.com
	MD. Bablu Zzaman	Forester, BFD	01718003727	zzaman1978@gmai.com
	Md. Nasrat Jahan	Jr. Specialist, RS, CEGIS	01817-592864	njageodu@gmail.com
	Dewan Lafrul Hassan	Ex. DCCF, FD	01552489197	dewanhassan82@yahoo.com
	Sikder Saeeduzzaman	Asst. GIS Specialist	01717-634585	ceaser.lourp@gmail.com
	Farid Uddin Ahmed	ED, Arannayk Foundation	01713040583	farid1952@gmail.com
	Abdul Mafad	CF, BFD	01714406886	mamafadbfd1984@gmail.com
	Mohammad Abdul Awal Sarker	DFO, BFD	01712638606	awal.bfd@gmail.com
	Md. Mahmudur Rahman	N.MIS, BFD	01913510107	Miscis.cropwrop@gmail.com

	Asma Islam	Draftsman, Forest Department	01552444690	asmafd1967@gmail.com
	Ruhul Mohaiman	CREL	01726892305	rmchowdhury@winrock.org
	Masud Hasan Chowdhury	Director, datex	01713030860	masudhasan@gmail.com
	Abdul Manna	PO, AF	01735684848	mannan@arannayk.org
	Abani Bhusan Thakur	CF, FD	01761494639	Thakur.abani@yahoo.com
	Zahher Iqbal	FD	01711443750	Ziqbal60@gmail.com
	Nikhil	FAO	0116371965	Nikhil_forestry@yahoo.com
	Henry	FAO		Matie.henry@fao.org
	Rashed Jalal	FAO	01773383854	Rashed.jalal@fao.org
	MD. Tariq Aziz	BFD	01790284328	tariqaziz9718@gmail.com
	Tasnuva Shabnam Udit	FAO	01677539047	tasnuva.shabnam@gmail.com
	Rakibul Hasan Mukul	BFD	01711438032	lalpiprey@gmail.com
	Afroza Begum	Research Officer, FD	01711283846	b.afroza@yahoo.com
	Mohammed Saidur Rahman	Jr. Specialist, RS, CEGIS	01819877944	msrahman@cegisbd.com
	Mir Fahim Shaumek	Do	01817527284	mfshaunak@gmail.com
	MD. Tariqul Islam	FD	01715026457	Tarik.forest@gmail.com
	Laskar M. Rahman	FAO	01732998449	Laskar.rahman@fao.org
	Md. Humayun Kabir	DFO, Coastal Forest Division, Chittagong	01819655811	Acfforest72@gmail.com
	Feroze Ahmed Kanak	Research Asso	01711235720	franak@cegisbd.com
	Imran Ahmed	DFO, Rajshahi,	01711445247	imranforest@gmail.com

		BFD		
	Md. Ariful Hoque belal	DCF, BFD	01712115625	arifulhoquebelal@gmail.com
	Sharmin Begum Sheuli	Sr. Research Officer, BFD	01931407861	To.shewli99@gmail.com
	Baktian Nur Siddiqui	DFO, DHAKA, WL	01711819670	Bakthiar1971@gmail.com
	A.S.M. Tahir Uddin	DFO, Dhaka, WL	01550603403	
	Dr. Abdulla AL Mamun Chowdhury	DCCF, (Retd)	01711943614	amamunchy@yahoo.com

Appendix 3: Evaluation of the consultation

National Consultation for Forest Boundary Digitization

Respondents:		
Male	8	80%
Female	1	10%
I would describe my self as?		
A professor/academic	0	0%
A student	0	0%
Forest Department staff	3	50%
Government staff (outside Forest Department)	0	0%
NGO staff	3	50%
Private consultant	1	17%
Other	2	33%
My professional background relates most closely to:		
Forester	3	50%
GIS/RS	6	100%
Statistics	0	0%
Social survey/assessment	0	0%
Economics	0	0%
Natural Resource Management	3	50%
Ecology	0	0%
other	0	0%
My years of relevant experience is:		
1-2 years	1	17%
3-5 years	1	17%
5-7 years	0	0%
8-10 years	4	67%
More than 10 years	3	50%
The workshop was relevant to my daily work		
1-2 years	4	67%
3-5 years	5	83%
5-7 years	0	0%
8-10 years	0	0%
More than 10 years	0	0%

I had enough relevant experience to make a valuable contribution to the event		
Strongly agree	3	50%
Agree	6	100%
Neutral	0	0%
Disagree	0	0%
Strongly disagree	0	0%
The outcomes of the event were well defined		
Strongly agree	1	17%
Agree	7	117%
Neutral	1	17%
Disagree	0	0%
Strongly disagree	0	0%
The event was well organised		
Strongly agree	3	50%
Agree	5	83%
Neutral	1	17%
Disagree	0	0%
Strongly disagree	0	0%
The resource person/facilitator(s) presented information in a way that i could understand and was easy to follow		
Strongly agree	3	50%
Agree	5	83%
Neutral	1	17%
Disagree	0	0%
Strongly disagree	0	0%
I feel like the event was a good use of my time		
Strongly agree	2	33%
Agree	6	100%
Neutral	1	17%
Disagree	0	0%
Strongly disagree	0	0%
I was pleased with the venue/meeting room/snacks etc		
Strongly agree	4	67%
Agree	5	83%
Neutral	0	0%
Disagree	0	0%
Strongly disagree	0	0%

Q1: Are there other people/agencies/organisations that you think should have been included in the event?

Persons from Department of Land Record and Survey,
Local Government Representatives from pilot sites
Upazila Administration representatives from pilot sites
1.Mohammad Abdul Hadi
Geospatial database consultant, Survey of Bangladesh
Head of Remote Sensing, ACI Limited
General Secretary, BSGI

2.Md. Mahbubur Rahman
GIS & Remote Sensing Specialist
National Land Zoning Project
Ministry of Land

3.Ministry of Land

4.DLRS

5.Survey of Bangladesh

6.LGED

7.Water Development Board

Department of Land Records and Survey

DLRS (Directorate of Land Record and Survey)

District Commissioner's and Bangladesh Survey Department's Personnel/Representative may be present.

Land Zoning Professionals,

DLRS officers,

Survey of Bangladesh.

GIS personnel from SOB & DLRS should have been included in the event.

Q2: What do you think should be the next steps in the process?

Please share the minutes of the consultation with us

1.To prepare a single Methodology² pooled two reports (on methodology) submitted by CEGIS and datEx.

2.To prepare a single Manual² pooled two reports submitted by CEGIS and datEx.

3.Detailed validation of these boundaries.

4.Technology transfer (training, etc.) to the local/field level personnel of Forestry Department.

5.Update and make it more correct involving local/field level personnel of Forestry Department.

6.To take initiatives for delineating forest boundaries based on CS/RS/BS maps for entire Bangladesh.

Delineate the rest of forest land as early as possible

Steps for Proper validation or legality attribution may be taken into consideration.

Government agencies (Ministry of Land, DLRS and Survey of Bangladesh) must be work together, other wise it will fail.

After completing the Piloting process, RIMS personnel of FD should be engaged in the next steps of the activities.

Q3: Any other comments

This is a very challenging job, however most relevant and important for the Forestry Sector;
To include DLRS, LGI and Upazila Administration people: please plan to keep some budget for them to be effectively engaged.

I think it's good initiative for Bangladesh Forest Department, though is difficult to implementation.
Accuracy should be minimum level.

It is very necessary to save our forest.

Forest boundary digitization is a very essential work for Forest Department for forest land identification which is one of the most important part of sustainable forest management of the country.