Proceedings of the consultation workshop on national tree species database

Bangladesh Forest Department
18 May 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 Stated 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.

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Executive Summary

Establishment of a forest species list in Bangladesh is crucial for the assessment of forestry resources and its management. A list of tree species is key to allow the management and analysis of forest inventory data. Presently inconsistent, erroneous and incomplete tree species lists make it difficult to assess biodiversity and its dynamics, to produce quantitative estimates of the status of non-timber forest products, and ultimately to sustainably manage forest resources. In addition, the identification of tree species is often undertaken using vernacular names. Linking the tree species identification to their use, and integration of information between local and national level is particularly complex if the tree species list is not properly established. In addition, the analysis of forest inventory data is performed using global database and linking global databases with local and national ground field measurement for several purpose including wood density, biomass expansion factors, requires the use of a quality controlled tree species list. Very recently, a LoA has been signed between FAO and BNH in support of the Improved National Tree Species Database to support forest monitoring and assessment under Project GCP/BGD/058/USA.The project aims are to (i) develop a reliable, consistent and correct tree species list; (ii) increase species identification capacity in the field; and (iii) strength the capacity to manage species data and associated metadata.

The project has been designed to result the following outputs: (i) National consultation on tree species identification organized and documented; (ii) National tree and forest species list developed including scientific, local names and meta-data; (iii) National capacities on tree species identification strengthened; (iv) final report including the identification of discrepancies with global database for tree species and forest resource assessment. The first output of the project will be achievied with the activity '*Strengthen collaboration between national stakeholders involved in plant species identification'*.

Under the above said activity, Bangladesh National Herbarium organized a day long workshop entitled **'National Tree Species Database'** on 18 May 2016 at BNH auditorium, Mirpur, Dhaka. A total of 50 expert participants (plant taxonomists, conservationists/forest managers, ecologists) from different organizations attended in the workshop (Appendix-2). The objectives of the the workshop are to: (1) create a network of experts, (2) identify and collect all the necessary documentation for tree species identification, (3) prepare a standard format of national database for tree species identification in forests, (4) collect all necessary meta-data to contribute to the species identification and control the quality.

Expert consultation workshop resulted in (i) determination of methodolgy for preparing updated database, (ii) development of consensus among the experts for sharing information, (iii) finalization of a standard database format and (iv) establishment of a network among the experts.

Total 50 participants (37 male and 13 female) attended in the workshop.

Acronyms

BAU	Bangladesh Agriculture University
BFD	Bangladesh Forest Department
BFRI	Bangladesh Forest Research Institute
BNH	Bangladesh Nationala Herbarium
CHT	Chittagong Hill Tracts
CRO	Chief Research Officer
CU	University of Chittagong
DACB	Bangladesh Nationala Herbarium
DCCF	Deputy Chief Conservator of Forest
DFO	Divisional Forest Officer
DU	University of Dhaka
FAO	Food and Agriculture Organization of the United Nations
IFES,	Institute of Forestry and Environmental Science
IUCN	International Union for Conservation of Nature
LoA	Letter of Agreement
MoEF	Ministry of Environment and Forests
PSO	Principal Scientific Officer

Contents

1. Introduction

Establishment of a forest tree species list in Bangladesh is crucial for the assessment of forestry resources and its management. A list of tree species is key to allow the management and analysis of forest inventory data. Presently inconsistent, erroneous and incomplete tree species list makes it difficult to assess biodiversity and its dynamics, and ultimately to sustainably manage forest resources. In addition, the identification of tree species is often undertaken using vernacular names. Hence, a coreect and reliable the tree species database is essential. Very recently, a LoA has been signed between FAO and BNH in support of the Improved National Tree Species Database to support forest monitoring and assessment under Project GCP/BGD/058/USA. The project aims are to (i) develop a reliable, consistent and correct tree species list; (ii) increase species identification capacity in the field; and (iii) strength the capacity to manage species data and associated metadata.

The project entitled *"Improved National Tree Species Database to support forest monitoring and assessment"* has been designed to result the following outputs: (i) National consultation on tree species identification organized and documented; (ii) National tree and forest species list developed including scientific, local names and meta-data; (iii) National capacities on tree species identification strengthened; (iv) Final report including the identification of discrepancies with global database for tree species and forest resource assessment. The first output of the project was achieved with the activity '*Strengthen collaboration between national stakeholders involved in plant species identification*'.

Under the above said activity, Bangladesh National Herbarium organized a daly long workshop entitled **'National Tree Species Database'** held on 18 May 2016 at BNH auditorium, Mirpur, Dhaka. Mr. Md. Nurul Karim, Additional Secretary of the Ministry of Environment and Forests was present as the Chief Guest. Mr. Mohammed Shafiul Alam Chowdhury, DCCF, BFD, Mr. Nur Ahamed Khondaker, Assistant FAO Representative and Mr. Matieu Henry, Chief Technical Advisor, FAO were present on the occasion as Special Guests. Two speakers presented two theme papers in the workshop. A total of 50 expert participants (plant taxonomists, conservationists/forest managers, ecologists) from more than thirty stakeholder organizations (colleges, universities, research institutions) attended in the workshop (Appendix-1).

2. Objectives

The overall objectives of the workshop were to share the idea about a standard national tree species database and an effictive tree species identification technique. The specific objectives of the consultation were to:

- Create networks among the experts
- Identify, collect and sharing existing references, documents, images etc. on tree species
- Finalize a standard format for tree species database that has been developed by the BNH scientists
- Develop an effective tree identification technique by using morphological characters and software

3. Methodology

The consultation workshop was divided into three sessions based on agenda of the workshop (<u>APPENDIX 1: Program of the workshop</u>)

- Inauguration session
- Technical session I: Standard database for tree species and
- Technical session II: Taxonomic characters to be used for identification of tree species'

Inaugural session was consisted of a brief presentation about the program highlighting its background, expected outputs, activities, budget, and remaks from chief guest, special guests and the chair. On the other hand, both of the thechnical session consisted of a presentations followed by open discussion. At the end, two questionnaires were presented and decission were made on those.

4. Inauguration Session

At the beginning, **Sarder Nasir Uddin** (Principal Scientific Officer, Bangladesh National Herbarium) welcomed the participants to attend the workshop and presented briefly on the proposed program. He informed that very recently a Letter of Agreement (LoA) has been signed between Bangladesh National Herbarium (BNH) and Food and Agriculture Organazation of the United Nations (FAO). Under that LoA, BNH will implement a small program called 'Improved National Tree Species Database to support forest monitoring and assessment'. It is a sub-project under 'Strengthening National Forest Inventory ans Satellitee Land Monitoring System (GCP/BGD/058/USA)' project. FAO will pay BNH a total of 1,119,500.00 BDT for the program and the duration of the program is 5 months (May 2016 to Sptember 2016). He explained that national tree species list is essential for both forest resource assessment and sustainable management. It is also essential to understand biodiversity, its dynamics and response to the adverse effects of the unpredictable climate changes. The present tree species list is inconsistent, erroneous and incomplete, because, it was made mainly based on the local names. In Bangladesh, local names are not reliable in many instances though it is a very useful tool for species identification.

He mentioned that identification of tree species is very important during forest inventory. A standard data base can help the surveyors for identification of tree species. Bangladesh Forest Department (BFD) does not have any standard tree species database comparable to global database at the moment. Many initiatives have been taken world wide for improving identification and biodiversity monitoring system by using software, digital images, spectral characteristics, DNA barcoding etc. However, there are no alternative to have some basic elements *viz*. correct species list, capaciti for identification of tree species in the field & managing species database. The aims of the present program are to: (i) prepare a reliable, consistent and correct species list, (ii) develop an accurate and effecient identification techniques for tree species and (iii) enhance the identification capacity in the field and managing species database.

He described four expected outputs those would be achieved under the above said program. Those outputs are: (i) national consultation on tree species organized and documented, (ii)

national tree species list developed, (iii) national capacities on tree species identification strengthened and (iv) final report including the identification of discrepancies with global database for tree species and forest resource assessment. He explained detailed about the following five activities undertaken to achieve those outputs. They are: (i) strengthen collaboration between national stakeholders, (ii) compile descriptive lists of tree and forest species, (iii) provide training and training materials on tree species identification, (iv) control of quality and integration of tree species information, and (v) Establish a database for the tree species. He mentioned that under the first activity the present consultation workshop had been organized and the objectives of the workshop are: (i) create networks among the experts, (ii) identify and collect references/documents on tree species, (iii) prepare a standard format for tree species database, (iv) control the quality of the database and (v) develop an effective identification technique.

Mr. Matieu Henry, Chief Technical Advisor, FAO of the UNs addressed the occassion as a special guest. He described the unpredictable effects of climate change as the biggest crisis for the world. He also described about the role of trees and forests in the stabilization of ecosystems, climate change mitigation and adaptation. He mentioned about the multitudes of services (*viz.* water regulation, food web, energy cycle etc.) provided by trees and forests. He told that analysis of huge amanout of plant related data has improved our knowledge to assess the state of resources. He also told that identification of species is essential for the calculation of tree density, timber volume, biomass, carbon source etc. He mentioned that knowing the name of plant is also vital for resources assessment, management and monitoring system. He informed that identification of plant species is fundamental for all societies and is more than thousand years old. He also informed about the uses of new and advanced techniques *viz.* DNA barcoding, pictures etc. in plant identification.

He explained the aims of the present project as to support BFD for implementing national forest monitoring system as well as to strengthen collaboration among national institutions. He told that such monitoring system would provide information about the status of trees and forests in regular intervals and that information would help in the formulation of national policies and actions related to trees and forests. He described correct identification of tree species and updated database is crucial for that purpose. He described the existing database erroneous because many species are wrongly named, synonymous and illegitimate nomenclature. He gave emphasis on the preparation of one improved national database that would be used and referenced by all stakeholders. He suggested that such database could be prepared with the leadership of BNH along with the collaboration of all universities/research institutions. He wished that the database would allow all to identify national tree species. He thanked all the participants for their presence in the workshop.

Mr. Nur Ahamed Khondaker, Assistant FAO Representative addressed the workshop as special guest. He described the program "Improved National Tree Species Database to support forest monitoring and assessment" as a good initiative. He also tols about the importance of developing an accurate identification technique and a correct species database. He told that FAO was glad to be a part of such an initiative. He also asked the Chief Guest from MoEF to support such scientific activity and quicken the approving process in future. He thanked all the experts participating in the workshop and seek their active contribution in producing good output.

Mr. Mohammed Shafiul Alam Chowdhury, DCCF, BFD also addressed the occasion as Special Guest. He told about the usefulness of tree species database in forestry & forest based development and policy & strategy formulation. He also told that it helps us to understand the adverse effects of climate change and biodiversity especially undergrowth and wildlife for making their conservation strategy. It can help in the selection of species for plantation, economic assessment, sustainable forest management, and improving ecosystem services. We can know different information like fruiting time, propagation techniques, social services obtained etc. from species database. He described it as a very important project for forest monitoring and assessment. He thanked FAO for financing in the project and participant for their contribution.

In the address of the Chief Guest, **Mr. Md. Nurul Karim**, Additional Secretary, MoEF thanked FAO for assisting BNH to prepare a national tree species database, so that we can manage our biodiversity and forests. He described biodiversity loss as irreversible. He instructed BNH and BFRI to undertake more and more research projects to generate baseline information, so that we can protect our enriched biodiversity from degradation. He wished the success of the program with the expected output that is an international standard tree species database. He hoped that BFD will get much benefit in comprehensive forest monitoring and management system from this sub-project. He hoped that FAO would extend their cooperation in implementing such research projects in the future also. He thanked the distinguish participants and expressed gratitude to organizer.

The Chair of the consultation workshop **Mrs. Hosne Ara,** Director, BNH especially thanked to the Chief Guest and all Special Guests for their presence inspite of their very busy schedule and valuable remarks. She extended her gratitude to the experts comming from different part of the country and requested them to provide good suggestion. She also thanked FAO for providing financial support and some equipments to carry on the subproject. She expressed her wish that FAO would continue and expand such cooperation in the future also.

5. Technical Session-I

The session comprises with one presentation followed by expert discussion.

5.1 Presentation on 'Tree species database' by Dr. Md. Khairul Alam, Former CRO, BFRI

Dr. Alam discussed about the defination of tree, tree identification techniques, parameters to be included and resources to be used for preparation of the database. He recommended the definition of tree by Gschwantner *et al*., 2009 for NFI purposes. The definition is 'A **tree**, is a woody perennial of a species typically forming a single self-supporting main stem and having a definite crown'. He gave emphasis on the identification of species before preparing a database. He proposed scientific name as the communication medium to which all information is attached in the database. For a correct name it needs correct identification process. For correct identification, formal training, skill, experience and practice are needed. Identification of a plant can be done by comparing with organized written descriptions, identification keys, pictorial

manuals, herbarium specimens, vernacular names etc. He also mentioned the risk of uses of vernacular names for identification of plants.

He considered Bangladesh National Herbarium (DACB), Dhaka University Herbarium (SKH), Chittagong University Herbarium (CU), Bangladesh Forest Research Institute Herbarium (BFRI) etc. as the major resource centres. He proposed the following references as resources material: (i) Encyclopedia of Flora and Fauna of Bangladesh, (ii) Facsimiles of the 'Flora of Bangladesh', (iii) Common names of the plants, (iv) Dictionary of Plant Names of Bangladesh (Vascular Plant), (v) Annotated Checklist of the Tree Flora of Bangladesh, (vi) Annotated Checklists of the Woody Flora of Sylhet Forest, (vii) Annotated Checklist of the Woody Flora of Sal forest, (viii) An enumeration of Tree Species of Chittagong District, (ix) A book on Silviculture by Kamal Hussain, (x) Trees of Sundarbans and Embakments etc.

According to Dr. Alam, taxonomists with folk taxonomists can develope an integrated system of tree identification database for Bangladesh. He suggested following to prepare a standard tree species database:

- Identification of resource centers, one with central focus (DACB in this project)
- Identification of professionals and make a panel of contributors
- Stock taking and mobilization of soft and hard literatures, pictures, illustrations
- Split the list of vernacular names region wise like: CHT, Chittagong, Sylhet, Cox's Bazar, Tangail – Gazipur, Dinajpur, Sunderbans
- Listing of potential folk taxonomists (region wise)
- Standardization of vernacular names by cross-checking
- Field visits with folk taxonomists, authentication of vernacular names
- Design the metadata sheet (botanical name, vernacular names (regions), distribution in Bangladesh, morphological attributes --- tree height, canopy, bole, bark, exudates, leaf type, leaf architectures, flower colour, fruit character, periodicity………
- Data entry
- Designing a hard copy of Tree Identification manual

6. Technical Session-II

The session comprises with one presentation followed by expert discussion.

6.1 'Taxonomic Characters to be used for identification of Tree species' by Prof. Dr. Kamal Hossain, IFES, CU.

Presentation on (i.e. Vernacular name, morphological characters, Photographs, Illustrations)

Prof. Hossain discussed about different characteristics to be used in tree species identification. According to him habitat, bark, leaf, inflorescence, flower's part, fruit and seed characters of a tree species could be used for identification purpose. He gave a pictorial presentation on different characters (Annexure-3). He informed that use of each character would be filtered the list and allow the user to narrow the list and ultimately determine the tree species of interest. He also informed that more than one characters would be required to identify a species accurately. He
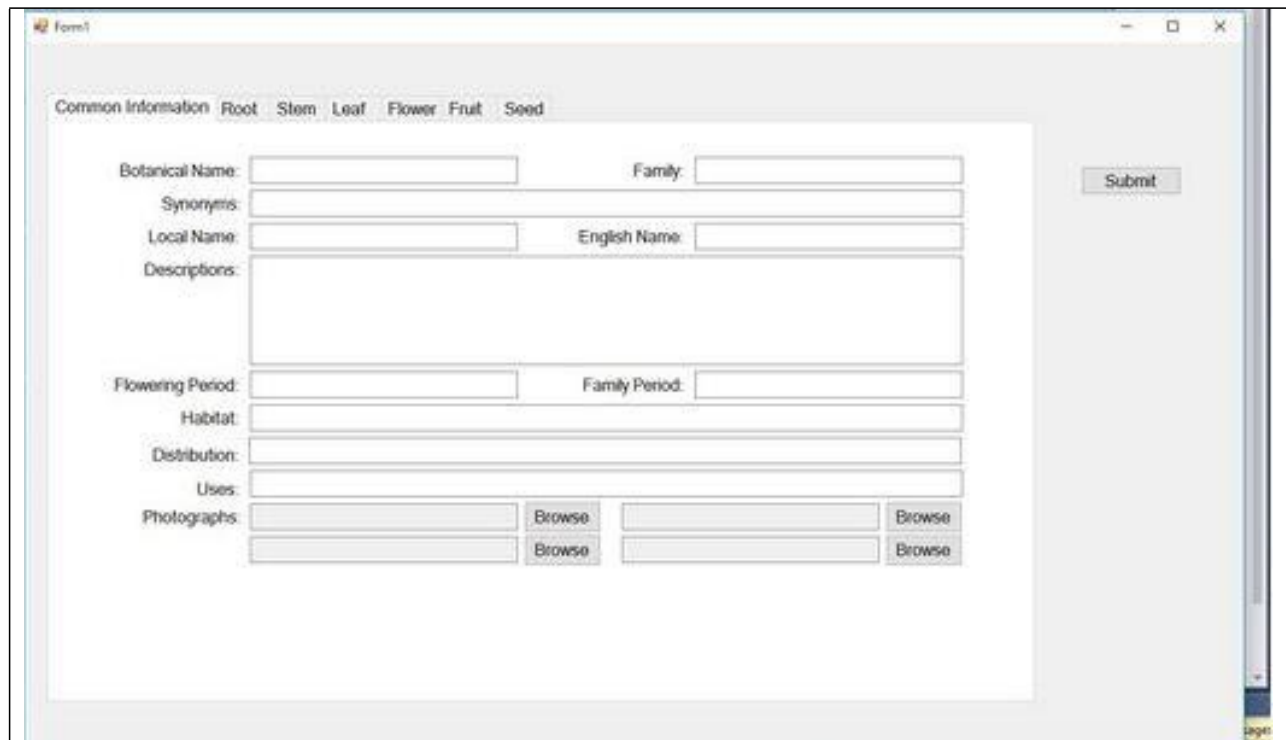
told that some characters are constant and others are variable. Hence, wise selection of characters is needed. He provided following characters to be used in identification purposes:

Habitat	Type (e.g. hill bottom, flat land, scrub)
	Soil composition (e.g. sand, mud)
	Soil color
	Site wet or dry (e.g. wetland or upland)
	Wet site description (e.g. freshwater or saltwater)
Range	Location of tree (e.g. city, hill forests, Terrace)
	Range of tree (use reference material)
Bark	Bark texture (e.g., smooth, fissured)
	Bark color
	Lenticels present (yes/ no)
	Lenticels description (e.g., horizontal, dots)
Leaf	Leaf petiolate or sessile
	Stipules present (yes/ no)
	Simple or compound leaf (include # of leaflets)
	Leaf arrangement (e.g. alternate, opposite)
	Overall leaf shape (e.g. lanceolate)
	Shape of leaf apex (e.g. acuminate)
	Shape of leaf base (e.g. cordate)
	Leaf margin (e.g. serrulate)
	Leaf venation (e.g. pinnate, parallel)
	Leaf surface texture (e.g. smooth, bumpy, scaly)
	Leaf thickness (e.g. thick and leathery)
	Leaf pubescence (hairs) present (yes/ no)
	Leaf smell
	Leaf taste (with caution)
Twigs	Bud type (naked or scaly)
	Leaf scar description (e.g. shape, size)
	Stipular scars present (yes/ no)
	Lenticels present (yes/ no)
	Lenticel description (e.g. horizontal, dots)
	Thorns present (yes/ no)
Inflorescence	Raceme, spike, spadix, corymb, cyme, umbel
Flowers	Flowers present (yes/ no)
	Cones present (yes/ no)
	Single flower or multiple flowers
	Flower description (e.g. shape and color)
Fruits/Seeds	Fruits present (yes/ no)
	Fruit description (e.g. shape, color, size)

7. Concluding session

At the begining of the concluding session Sarder Nasir Uddin, PSO, BNH presented a draft database format and two questionnaires before the experts for their valuable comments. Those are given below:

Database format

Questionnaire-1

Q.1: What is a tree? (measurement, i.e. height, dbh)
Q.2: What parameter should be included in the database?
Q.3: What references to be consulted to prepare tree species database?
Q.4: Who are the potential resource persons?
Q.5: Which information should be consulted for updating nomenclature?
Q.6: What measures should be taken for control of the quality of the database?

Questionnaire-2

Q.1: What are the techniques for identification of tree species in the field?
Q.2: What characters should be given preference in identification of tree species?
Q.3: What are the advantages and disadvantages of using software technique?
Q.4: Do you know the name of any species identification software?

8. Discussion

A total of ten experts participated in the discussion. The context of the discussions are given below.

Taking part in the open discussion, **Prof. Kamal Hossain** told that well established vernacular names could be included in the database. He recommended to collect all sample specimens along with associated data (i.e. phenology, altitude, longitude, latitude, local name) during national forest inventory work and deposited to BNH. He proposed to identify those specimens by national experts.

Mr. M. Manzurul Kadir Mia, Former PSO, BNH suggested to consult Wallich's catalogue during the preparation tree species list. According to his opinion, there may be found a number of tree species those had not been included in the Encyclopedia of Flora and fauna of Bangladesh.

Prof. Dr. Zashim Uddin, Dept. Botany, DU appreciated the initiative of the preparation of national tree species database. According to him, it would not be possible to complete the whole tree species database within this short period. He suggested to prepare a database of some common and useful forest tree first. He also suggested to include DNA barcoding data of tree species in the database.

Prof. Dr. Sheikh Bokhtear Uddin, Dept. Botany, CU suggested that plant images should be included in the database. However, it quite impossible to collect all tree species image from field during the project period. Hence, he proposed image sharing during the preparation of the database for the greater national interest.

Prof. Dr. Kamrul Huda, Dept. Botany, CU told that proper acknowledgement should be done in case of image sharing. According to him, database should include all basic information about the plant and species list should be prepared with the help of all existing literatures. He suggested to develop a software to identify tree species in the field by using some important characteristics.

Prof. Mustafizur Rahman, BAU, suggested to include place of occurrance and flowering & fruiting period of a species in the database.

Dr. Md. Zahidur Rahman Miah, DFO, BFD asked the organizer to do the tree species database considering national interest. He asked the organizer including not only the important tree species but also all tree species in the database. He expressed his doubtfulness about the use of plant identification software by the surveyors during national forest inventory work because of limited field facilities (i.e. laptop, electricity, network coverage).

Dr. Md. Haseeb Irfanullah, Program coordinator, IUCN Bangladesh suggested to use moblie apps for identification of species at least genus lebel and for gathering latitude and longitude reading of the tree species from field. He also suggested to monitor the activities of the surveyors who were trained under this program. He gave emphasis on getting feedback from BFD regarding utilization of this database.

Prof. M. Kamal Pasha, Dept. Botany, CU proposed to prepare a vital identification key with the use of 8-10 selected characteristics of plants. According to him, that key could be used by all. He proposed a simplified definition of tree species in Bangladesh context, that is as 'A tree is a woody plant that has a clear bole, 5 m or more tall, 8 cm or more in diameter at breast height and a definite canopy'.

Prof. Md. Abul Hassan, Dept. Botany, DU and the chair of the technical session took part in the discussion. He suggested to include herbarium specimen image or illustration if live image is not available. He identified Prof. Md. Zashim Uddin (DU), Prof. Sheikh Bokhtiar Uddin (CU), Prof. M. Atiquer Rahman (CU), Prof. Kamal Hossain (CU), Dr. Zahidur Rahman Mia, Sarder Nasir Uddin (BNH), Khondker Kamrul Islam (BNH), Naimur Rahman (BNH), Md. Sarif Hossain as the potential resource persons for tree species images. According to him, tree species those are not found at recent time but was recorded from Bangladesh in the past should include in the proposed database system. He recommended to add more than one images to clarify the morphological variation of the species. He also recommended to provide phenological data and specific location of rare tree species.

9. Decisions

- All tree species (i.e. indigenous, naturalized, cultivated) will be included in the national tree species database.
- All existing references will be consulted to prepare a preliminary list of national tree species.
- Scientific name will be the basis for species entry in proposed database.
- Under each species family, synonym/s, vernacular name/s, description, flowering & fruiting period, distribution in Bangladesh, uses, live and/or herbarium specimen image, illustration etc. will be included.
- In case of rare tree, specific location should be given.
- A software should be prepared for identification of tree species in the field using few simple characteristics.
- Accurately identified images will be asked to all potential resource personnel and will be shared in the shake of national interest after proper acknowledgement.

10. Next Steps

- Prepare a tree species list
- Finalize the data format for tree species
- Collect images, references, data from potential resource person
- Develop a tree identification software
- Complite tree species database with all associated metadata
- Make prepare the surveyors for using tree species database

APPENDIX 1: PROGRAM OF THE WORKSHOP

Registration	10:00-11:55
Inaugural session	
11:00-11:05	Recitation from the Holy Quran
11:05-11:15	Welcome address and brief presentation on the program by **Sarder Nasir Uddin**
11:15-11:20	Speech by Special guest: **Mr. Matieu Henry**, Chief Technical Advisor, FAO
11:20-11:30	Speech by Special guest: **Mr. Nur Ahamed Khondaker,** Assistant FAO Representative
11:30-11:40	Speech by Special guest: **Mr. Mohammed Shafiul Alam Chowdhury**, DCCF, Bangladesh Forest Department
11:40-11:55	Speech by the chief guest: **Mr. Md. Nurul Karim,** Additional Secretary, Ministry of Environment & Forests
11:55-12:00	Speech by Chair: **Mrs. Hosne Ara**, Director, Bangladesh National Herbarium
Tea break	12:00-12:30
Technical session I	Chair: **Prof. Dr. Md. Abul Hassan**, Department of Botany, University of Dhaka
12:30-1:00	Presentation on 'Standard database for tree species' by **Dr. Md. Khairul Alam**, Former CRO, Bangladesh Forest Research Institute, Chittagong
1:00-2:00	Brain storming session and open discussion
Lunch & Prayer	2:00-3:00
Technical session II	Chair: **Prof. Dr. Md. Abul Hassan**, Department of Botany, University of Dhaka
3:00-3:30	Presentation on 'Taxonomic Characters to be used for identification of Tree species' by **Prof. Dr. Kamal Hossain**, Department of Forestry and Environmental Science, Chittagong University.
3:30-4:30	Brain storming session and open discussion
Closing session	
4:30-4:45	Remarks by chair **Prof. Dr. Md. Abul Hassan**, Department of Botany, DU
4:45-4:50	Vote of thanks & closing remarks by **Mrs. Hosne Ara**, Director, Bangladesh National Herbarium
Refreshment	4:50-5:00

APPENDIX 2: LIST OF THE PARTICIPANTS

Sl no.	Name of the participants	Designation and organization	E-mail address
1	Dr. Md. Abul Hassan	Professor, Department of Botany, University of Dhaka	botany@univdhaka.edu
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