Proceedings of the Bangladesh Forest Inventory field teams refresher training

Bangladesh Forest Department

18-20 October 2017

USAID FROM THE AMERICAN PEOPLE

Food and Agriculture Organization of the United Nations

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), the Food and Agriculture Organization of the United Nations (FAO) and SilvaCarbon 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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Disclaimer

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Executive summery

Before starting the 2nd season of data collection of Bangladesh Forest Inventory (BFI), a refresher training for the field crews were badly needed to review their activities and inconsistencies done in the 1st season. To serve this purpose a three days training program was arranged jointly by FD and FAO. The field activities of the training took place in National Botanical Garden. Introduce with the errors and inconsistencies made by the field teams to improve the efficiency of data collection for the upcoming season was the key objective for the training. Resource persons from Forest Department, Universities and FAO were assigned to make the field crew's concept clear and solve their queries. The content of the training was designed on the basis of the need of the field crews. Hopefully this training will play a vital role for the improvement of data quality of BFI upcoming season.

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1 INTRODUCTION

Bangladesh Forest Inventory is a cumulative process of data collection, processing and assessment regarding the tree and forest resources, initiated by Bangladesh Forest department under the leadership of Ministry of Environment and Forest (MOEF). 12 trained field teams are assigned to collect the field data and 4 QA/QC teams are responsible to check and assure the data quality. Total 1858 plots are identified to collect data and total data collection process is divided into two sessions. 1st season data collection was started in 22nd November, 2016 and ended in May, 2017. In this season 1057 plots are measured and 801 plots are left for the 2nd season. BFI 2nd season data collection will start from the last week of November, 2017. After a long break field team have to re-start their field work. But it is possible that due to the break they may have forgotten things associated with data collection and processing. So, according to the decision of forest department and BFI team a refresher training program was organized for the field team members to recall and refresh their learnings.

2 OBJECTIVES

The main objectives of the training program are-

1) Introduce field teams with the inconsistencies of field data collection identified from 1st season
2) Recall and refresh of the field data collection process
3) Clearing the confusions of field teams

3 ACTIVITIES

3.1 General description

The training was scheduled for 3 days, started from 18th October and ended on 20th October. The classroom session of the training took place at Hotel Grand Prince in Mirpur-2 and for the field session field teams were took to the National Botanical Garden.

3.2 Training Overview

3.2.1 First Day of the Training

18th October, 2017

At 9:30 am the program was started though it was supposed to be started at 9:00 am. The projector of the hotel administration was damaged that's why the program was delayed.

- ✓ Mr. Zaheer Iqbal started the training with introductory speech and all participants introduced themselves.
- ✓ Program schedule is slightly changed
- ✓ At 9:45 am Mr. Kirstofer Johnson started his presentation regarding the frequently asked question and Mr. Rajib Mahmud helped to translate the presentation and facilitating the discussion. Queries are like below-
    - What is the importance of stump measurement?
    - How to ensure that all trees are measured in a plot?
    - How to make RP stable and find out plot centers in later measurement
    - Code properly due to collect soil sample
    - Tag tree properly (spray twice in a tree, one in bottom and one in man height)

- ✓ Mr. Imran Ahmed requested all team members to work sincerely and asked everyone to write notes if they get anything, this will help.
- ✓ At 10:20 am Mr. Rajib Mahmud started his presentation representing the errors found in data collected from the field by field teams
  - — Tree height estimation
  - — Unacceptable value for tree height of some species
- ✓ Soil issues are presented by Mr. Akter Hossain
  - — Lf no should be mentioned
  - — Transport soil as soon as possible
  - — Little amount of soil than required
- ✓ LF presentation started at 12:15 am by Mr. Zaheer Iqbal, Mr. Jalal Rashed was also present there
  - — Participants asked different questions to solve their confusion

Figure 1: FAQ session

After Lunch break field teams went to the Botanical garden for field practice. They measured some selected trees and selected attributes-

- — Tree length and slope were measured by every individual
- — QA/QC persons were in charge of the observation
- — Different teams repeatedly measure same trees and same attributes

This season was conducted to ensure the accuracy of the field team members in case of height and slope measurements.

3.2.2 Second day of the training

19th October, 2017

The second day of the training is completely focused on field measurements practice of the field crews. The whole day was spent in the field. The team members were divided into five group among themselves and perform the field measurement like BFI field work except the soil and litter sampling activities. The resource persons were also divided and with each group one resource person was assigned to check the activities of the field crews. The main focus of the resource persons are concentrated on-

- ✓ Establish plot center as like as BFI field plot measurement
- ✓ Measure slope distance
- ✓ Measuring the lean tree
- ✓ Follow up the errors done by field crews in case of CWD and FWD measurement
- ✓ Measuring the height perfectly when tree is partially visible
- ✓ LF identification and estimation of crown cover
- ✓ Check the efficiency of the field teams

Based on the observation the resource persons suggested that; after arriving plot center first measure the CWD and FWD attributes, otherwise the debris can be damaged or moved by the movement of team members. They also suggested that in case of height measurement if a tree is partially visible from one point then move to different points to get clear a visibility. Improving the efficiency, understanding and effective work distribution is also suggested by the resource persons.

Figure 2: Field activities by the participants

3.2.3 Final day of the training

20th October, 2017

Soil sampling field work session

The session started at 8.30am as the participants and resource persons reached at National Botanical Garden. The session was led by Mr. Dr. Mahmood Hossain resource person from Khulna University for soil and litter survey. He and his team is responsible to receive the soil samples and analyzing the samples. Due to heavy rain it took some time to start the field practice season of soil sampling.

Soil queries briefing session

First in the sitting arrangement Dr. Mahmood Hossain briefed about the common errors in soil sampling. The common errors he mentioned were-

- Improper collection of soil sample for bulk density

- The rings with bulk density samples are not properly labelled sometimes. Some field teams don't follow the labelling procedure as mentioned in the BFI manual. As a result, the soil sample analyzing laboratory receive rings missing land feature number, mismatching land feature number etc.
- Sometimes there is branch, litter, stones and plant roots in soil rings. It seemed that sometimes the soil is manually put into the soil ring by soil sampler. Vacant spaces inside the ring was also found in some cases. All these deviate the bulk density values from the natural range.
- The soil texture samples storage containers are not of good quality as these were found broken in some cases. It was due to the use of low quality plastic container that bought from local markets for carrying and sending soil sampling to the laboratory. Mr. Falgoonee cleared later that, this situation occurs when the field teams conduct data collection out of movement plan. Sometimes, it takes time to reach the logistics (container, rings etc.) to the field teams.
- About litter collection, Dr. Mahmud said that, they receive litter sometimes in garbage bag instead of specified polythene. Other common mistakes regarding litter sampling include receipt of decomposed litter, litter associated with plant parts not specified as litter in the BFI manual etc. The decomposed litter cause higher percentage of litter carbon. However, some teams especially the FTs worked in the remote plots face difficulties to send the litter and soil samples.
- Sometimes the field teams are in confusion regarding litter sample collection from agricultural field. It was cleared that litter samples should be collected from all plots even though if it is agricultural land or rural settlement. Soil and litter sample collection location can be shifted to suitable location inside the M plot if the BFI manual specified location is on a waterlogged land or inaccessible.

Figure 3: Soil sampling discussion session

Inspecting soil sample collection by FTs

After the briefing session all the field teams were given instruments and asked for collection of soil sample for bulk density and soil texture. The field teams collected soil by different methods including intrusion of augur for texture sample, hammering ring for bulk density sample and it method for both bulk density and soil texture sample. Each team was supervised a QA/QC member of BFI. During this process the errors were identified practically.

The errors committed by the field teams during collection of samples were shown as well as the appropriate way of soil collection and method of soil cores or containers labelling was demonstrated. Demonstration of the soil sample collection appropriately include i) clearing off the grasses from the sampling spot, ii) intruding the augur or soil ring

vertically, iii) pouring water if the soil is hard/difficult to intrude the augur, iv) measurement of the core length, v) the edges of the soil rings, vi) soil sampling in waterlogged area, vii) soil sampling by pit method etc.

This inspection and demonstration process is ended through answering some frequently asked question regarding common errors in soil sample collection as mentioned earlier.

Final Discussion and test section

After lunch an overall final discussion took place in the lead of Mr. Aktar Hossain and Mr. Rubiot Abdullah. This resources persons answered the question and solved the query of the participants. They showed how to measure a lean tree, how to point the top of the tree to take actual measurement, crown cover measurement and estimation, tree height measurement when a tree is not visible completely etc. The field crews along with the resource persons arranged a deep discussion to solve their issue.

After the discussion a short evaluation test took place for the field crews, it was an open book test and crews are instructed to use the BFI field manual to get the answers of those. The questions set was prepared my Mr. Kirstofer Johnson (question set is attached in appendix-4). The objective of the test is not to evaluate field crews but to inspire them to read manuals if they found any query. After the test the training was declared end with a short speech of Mr. Zaheer Iqbal, National Project Coordinator.

Figure 4: Open Book test of participants

4 OBSERVATIONS AND RECOMMENDATION

Throughout the Refresher Training, there was good discussion about successes to date as well as challenges that need attention before starting the new field season. Following are some specific observations and recommendations:

- The BFI already provided some figures of different types tree leaves and bark that are valuable for identifying plant species. However, these would be more useful as color photos if they were laminated.

- The field teams are generally provided with one Laser Range Finder for tree measurement. In the training they requested to provide one more Laser Range Finder (that means in total two laser range finder).
- It is important that the central BFI team supply quality pots (containers) for soil texture sample collection. Last season these were sometimes not available and poor substitutes had to be used.
- Some rings and caps used for bulk density sample collections were damaged in the first session. Therefore, a sufficient number of new ones and extras should be purchased.
- In the last field season sometimes teams were forgetting to include all the necessary soil samples or information about the samples. A check list is suggested for recording the number as well as relevant information about soil and litter. A copy should be sent to BFI headquarter and Khulna University.
- An identity Card (ID) needs to be provided to all field team members from the BFI headquarters. It will facilitate smooth field work.
- The issue was raised about if we should change the protocol for collecting soil samples on partially inaccessible plots. Under the current protocol, if in any plot soil and littler samples cannot be collected from 1, 2 and 3 subplots (all the three) as per the BFI manual, then to avoid missing of soil and litter samples from that plot/location it suggested to take soil and litter samples from 4th and 5th subplots. However, if any of the first three subplots is accessible and soil & litter sample can be collected then it is not necessary to collect the soil sample from 4th or 5th subplot. Alternatively, it was suggested to not collect any soil sample in the case of inaccessibility on the first three subplots.
- In order to better communicate and quickly troubleshoot among teams, it was suggested to open a Facebook page (by BFI headquarter) for BFI team members. It is expected to be help in communicating species identification, frequently asked questions and solutions to problems faced in the field.
- Encourage the field team leaders to have a DBBL account and link it to the rocket account in order to get higher limits of financial transaction so that they can avoid daily limits in money withdrawal from rocket account.
- Generally, field teams are requested to only visit one plot per day and follow their movement plans as closely as possible. However, it is recognized that more than one plot may be visited in a day in the case that plot is inaccessible/partially inaccessible or near to another plot.

Appendix 1. Agenda

[18 October, 2017]

[Time]	[Activity]	[Responsible person]	[location]
[09:00 am]-[01:15 pm]	Welcome and Introductions (10 min)	Mr. Zaheer Iqbal	Conference Room, Hotel Grand Prince
	New BNH app (10 min)	Mr. Mondal Falgoonee Kumar	Conference Room, Hotel Grand Prince
	Common Data Input Errors, Including Soils (60 min)	Mr. Rajib Mahmud and Mr. Aktar Hossain	Conference Room, Hotel Grand Prince
	Tea Break (15 min)		
	Results and Common Errors from the QA/QC workshop	Mr. Kristofer Jhonson	Conference Room, Hotel Grand Prince
	Land Feature presentation (40 min)	Mr. Zaheer Iqbal	Conference Room, Hotel Grand Prince
	Participants Feedback Session (90 min) How did last season go? What were the successes? What were the major challenges? What support did you feel was lacking?	Mr. Zaheer Iqbal	Conference Room, Hotel Grand Prince
[01:15 pm] – [02:15 pm]	Lunch		Conference Room, Hotel Grand Prince
[02:15 pm] – [02:45 pm]	Travel to Botanical Garden		
[02:45 pm] – [05:00 pm]	Field Exercise: Tree Length, Slope Distance, LF Test Individuals will each measure marked trees and determine the LF of a subplot	QA's and FAO	National Botanical Garden

[19 October, 2017]

[Time]	[Activity]	[location]
[08:00 am] to [08:30 am]	Travel to Botanical Garden	

[08:30 am] to [01:00 pm]	Field Exercise: Establishing and measuring a subplot. Teams will complete 3 subplots (except soils and litter) each. QA's will do a Hot Check. Emphasis will be on locating the plot center.	Botanical Garden
[01:00 pm] to [02:00 pm]	Lunch	Botanical Garden
[02:00 pm] to [04:00 pm]	Discussion - challenges and solutions discovered by both teams and QA's led by QA's	Botanical Garden

[20 October, 2017]

[Time]	**[Activity]**	**[location]**
[08:00 am] to [08:30 am]	Travel to Botanical Garden	
[8:30 am] to [12:30 pm]	Field Exercise: Soil Sampling Dr. Mahmood Hossain will review the checklist for soil sample collection. Teams will collect soils and litter from the same 3 subplots. Every team member will practice a soil sample collection. Dr. Mahmood and QA's will do a Hot Check	Botanical Garden
	Field Exercise (Only DGPS team) DPGS team will be given GPS coordinates and WO's. They will locate the plot center and register the DGPS using the manual	Botanical Garden
[12:30 pm] to [02:30 pm]	Lunch	
[02:30 pm] to [04:30 pm]	Discussion (30 min) How can we improve next season? What support can BFD/FAO provide?	Botanical Garden
	Open Book Quiz (30 min)	Botanical Garden
	Finalize Movement Plans for all Teams (60 min) Side meeting with CHT field team.	Botanical Garden
	Closing Remarks	Botanical Garden

Appendix 2. List of Participants

Sl. No.	Name	TEAM	Designation/Organization	Mobile No.
1	Kalendra_Chakma	T1	Forestry Diploma	01732514868
2	Mr. Uhlamong Chowdhury	T2	Forester/USF Division, Rangamati	01556773953
3	Thoai Shoi Mong Marma	T2	Forestry Diploma	01790864556
4	Mr. Saiful Islam	T3	Forester /Cox'sbazar South Division	
5	Mr. Srimoy Chakma	T3	Forestry Diploma	1556641601
6	Mr. Md. Sajjaduzzaman	T4	ACF/Tangail Forest Division	01720658107
7	Mr. Md. Rezaul Karim	T4	Forester/Jhum Control Division, Rangamati	01556574858
8	Mr. Rafsan Hussain	T4	Forestry Graduate	1723326065
9	Mr. AZM Hasanur Rahman	T5	ACF/Sylhet Forest Division	01711944771
10	Mr. Md. Saidur Rahman	T5	Forester/Social Forest Division, Rajshahi	01712211102
11	Md. Elmoon Bahar	T5	Forestry Diploma	01822518985
12	Dr. Prantosh Chandra Roy	T6	ACF/Social Forest Division, Rangpur	01712224429
13	Mr. Dipon Chakma	T6	Forester/Jhum Control Forest Division	01836252909
14	Zico Biswas	T6	Forestry Diploma	01733800698
15	Mr. Enamul Haq	T7	ACF/Dhaka Forest Division	01711052796
16	Mr. Mohammad Monirul Islam	T7	Forester/WMNCD, Dhaka	01716582641
17	Md. Foseul Alam Shuvo	T7	Forestry Diploma	01911551420
18	Mr. Shyamal Kumer Ghose	T8	ACF/Social Forest Division, Dhaka	01711015945
19	Mr. Md. Abdul Hamid	T8	Forester/Noakhali Coastal Forest Division	01862008877
20	Md. Mosharraf Hossain	T8	Forestry Diploma	01737349487
21	Mr. Md. Mahedizzaman	T9	ACF/Sundarban East Forest Div, Bagerhat	01819751874

22	Mr. Md. Shahinur Rahman	T9	Forester/Bandarban Forest Division	01714867846
23	Md. Abu Wazid Musa	T9	Forestry Diploma	01929862819
24	Mr. Md. Rafiquzzaman Shah	T10	ACF/Social Forest Division, Dinajpur	01711315835
25	Mr. Sazzad Hossain	T10	Forester/Cox'sbazar South Forest Division	01831168150
26	A T M Siddiqur Rahman	T10	Forestry Diploma	01753160851
27	Mr. Md. Farid Meah	T11	ACF/Coastal Forest Division, Bhola	01761494740
28	Mr. Abu Sufian	T11	Forester/Social Forest Division, Barisal	01744592592
29	Md. Shahjahan Shajib	T11	Forestry Diploma	01957337499
30	Mr. Touhidor Rahaman	T12	Forester/Sundarban East Forest Division	01712643117
31	Mr. Rabiul Islam	T12	Forester/Mymensingh Forest Division	01717209012
32	Mr. Mehedi Hassan Rony	T12	Forestry Diploma	01828381460
33	Mr. Abul Kalam Azad	T13	Research Assistant (Grade-1)/BFRI	01818567647
34	Mr. Md. Mizanur Rahman Chowdhury	T13	Forester/CHT South Division, Rangamati	01819137817
35	Md.Yonus Ali	T13	Forestry Diploma	01820360175
36	Mr. Md. Salahuddin	Q1	DFO/Chittagong Hill Tracts South Division	01712263767
37	Mr. Imran Ahmed	Q2	DFO/ Social Forest Division, Rajshahi	01761494600
38	Mr. ANM Yasin Newaz	Q3	Director FSTI/Chittagong	01711447161
39	Mr. Md. Akhter Hossain	Q5	Assistant professor IFESCU	01827501435
40	Mr. S. M. Rubaiot Abdullah	Q3	Assistant professor, FWT KU	01718096435
41	Dr. Mahmood Hossain	KU	Professor	01711959380
42	Md. Shahansha Nooshad	DGPS	Forester	

43	Md. Sai2ful Islam Dewan	DGPS	Forester	
44	Md. Zaheer Iqbal	BFD		
45	TBD	BFD		
46	TBD	BFD		
47	Henry Matieu	FAO		
48	Kristofer Jhonson	FAO		
49	Laskar Maksudur Rahman	FAO		
50	Mariam Akter	FAO		
51	Rajib Mahamud	FAO		
52	Mondol Falgoonee Kumer	FAO		

Appendix 3. Equipment List for the training

Sl. #	Equipment	Quantity / team	Field team (x12)
1.1	Trupulse 200-Hypsometer	1	y
1.2	TruPulse Sx Foliage Filter	1	y
2	Suunto Clinometer	2	y
3	Suunto cover	2	y
4	Diameter measuring tape	3	y
5	Fiberglass tape measure	3	y
6	Electronic balance	1	y
7	Compass	3	y
8	Soil kit	1	y
9	Tin canister	1	y
10	GPS	1	y
12	*Tablets-Panasonic tough pad*	*1*	y
13	Machete	2	y
14	Tagging /Flagging tape	3	y
15	Vests - Half sleeves (Tan color)	7	y
16	Vests - Full sleeves (Tan color)	7	y
17	Cloth bags	3	y
18	Field notebook waterproof (Yellow cover)	3	y
19	Hammer	1	y
20	Knife	7	y
21	Folder / field	7	y
22	Zip Plastic bags	150	y
23	Carpenter tape with metric	5	y
24	Rechargeable battery with charger	2	y
25	Torch light (Rechargeable and metal)	5	y
26	First Aid Kit	1	y
27	Trekking bags	7	y
28	Red stick	1	y
29	Thin Ropes (nylon)	3	y
30	Field Form	7	y
31	Permanent Markers	14	y
32	Wooden Pencils	28	y
33	Erasure	14	y
34	Sharpener	14	y
35	Stapler machine	2	y
36	Stapler pin	2	y
37	Metal Ruler (size 12")	7	y
38	Water bottle (metal-1 Ltr.)	7	y

Appendix 4. Refresher Training Open Book Test

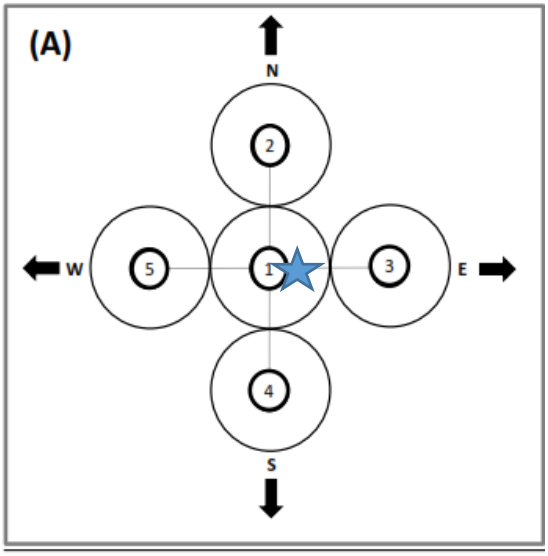
1. **The star below represents a soil sample location on plot 1723, located in the Coastal Zone with only 1 Land Feature. How many soil texture samples will you take from the location indicated? How will you label each sample container?**

(3 samples)

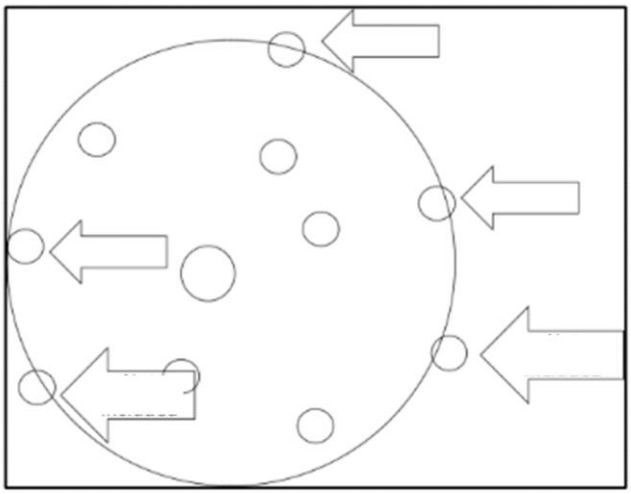
P 1723 / 0-15 / Texture / LF 1

P 1723 / 15-30 / Texture / LF 1

P 1723 / 30-100 / Texture / LF 1



2. **Fill in the arrow below with "Inlcude" or "Not include"**



(From top to bottom: include, include, include, not include, not include)

3. **Review the checklist for field equipment. How many total items are in the "Plot Measuring Items"? How many Diameter Tapes?**

(19) (3)

4. **You measure a piece of CWD of 10cm diameter and 25cm length at a distance of 7.5m along the CWD transect. Is the distance you measure slope distance or horizontal distance?**

(slope distance)

5. **Is the distance of the CWD transect the slope distance or horizontal distance?**

(horizontal distance)

6. **What is the minimum length that a CWD piece can be to measure it?**

(15cm)

7. **Litter includes: _dead_leaves_ , _(flowers)_ , _(fruits)_, _(seeds)_ , _(bark fragments__**

8. **"Fine Woody Debris includes downed _(dead branches)_, _(twigs)_ , and small tree or _(shrub)_ boles <8cm in diameter that are not attached to a living or standing dead source."**
9. **Coarse Wood Debris includes dead trees and tall stumps that are leaning > _(45)_ degrees from vertical.**
10. **Distance and bearing are measured for *<u>each stem</u>* for:**
    a. **Trees forked below < 0.3 m**
    b. **Trees forked between 0.3 and 1.3 m**
    c. **Both a and b**
    d. **None of the above**

    Answer: a

Appendix 5. List of Figures