

Executive Summary

The National Forest and Tree Resources Assessment 2005-2007 is the first of its kind in Bangladesh. The initiative for the assessment originated from the signing of the Rio convention in 1992, which states that *“timely, reliable and accurate information on forests and forest ecosystems is essential for public understanding and informed decision-making”*. In Bangladesh, a broad knowledge on the forest and tree resources is needed for redefining the policy and strategy of Bangladesh Forest Department as well as for developing a comprehensive National Forestry Action Plan (NFAP) which is considered a high priority after the work on the current inventory was concluded.

Bangladesh Forest Department (BFD), lead institution and responsible for the implementation of this first national forest and tree resources assessment (NFA), carried out the field data collection during 2005 - 2006 while the Bangladesh Space Research and Remote Sensing Organization (SPARRSO), responsible for the remote sensing survey, employed Landsat TM data from 2005 for mapping the land uses and forest types. The overall technical supervision of the NFA implementation has been provided by FAO Forestry department in Rome (FOMR), who also provided technical assistance to the GoB to strengthen the capacities of BFD in the area of planning and implementing NFAs, including methodology development, sampling design, harmonization of land use classifications, mapping, field survey, data management and reporting.

The long-term objective of NFA is to promote sustainable management of the forests and tree resources in Bangladesh founded on policy that integrates and balances relevant environmental and social aspects of forestry. Sustainable management aims at enhancing the social, economic and environmental functions of forests and trees on the basis of better knowledge and at improving the contribution of these resources in the national economy. Furthermore, the NFA should be used for the development of forest policies, forestry programs, over all forest management, sustainable development, conservation of the resources, and may be used by various institutions also from other sectors to develop integrated national policies. The direct objectives are to develop and strengthen the national capacities to collect, compile process and disseminate reliable and up-to-date information on forestry to national policy makers as well as to international organisations.

The NFA process initiated with a series of consultations with a broad representation of national stakeholders to deliberate the national information requests and how the NFA could answer to these needs and, at the same time, be harmonised with international reporting systems. The inventory covered a wide range of biophysical and socio-economic variables with emphasis on the management and use of the resources and was conducted through a systematic sampling with sampling units laid at a regular interval of 10 minute longitude and 15 minute latitude. Each sampling unit is designated as a “Tract” measuring one square kilometre and a total of 296 Tracts have been inventoried. The NFA data have been entered into an Access Data Base application and the findings from the analyses of these data are the main input to this report.

The NFA findings are mainly presented by major National Land Use Class (LUC): “Forest”, “Cultivated land”, “Villages”, “Built up areas” and “Inland water”. Findings related to “Forest” are also presented by forest type: “Hill forest”, “Mangrove forest”, “Mixed Broad-leaved/Bamboo forest”, “Sal forest”, “Long rotation plantations”, “Short rotation plantations” and “Mangrove plantations”. The NFA findings comprise statistics on Areas, Wood volumes, Biodiversity & Regeneration, Social and Economic aspects, Biomass and Carbon. The land use area statistics were generated using a combination of findings from the remote sensing survey and the field survey, following a harmonised land use/forest type classification system.

It is suggested that the NFA be carried out on a continuous basis to enable maintenance and development of competences with limited annual needs of resources. The NFA cycle should be around five years to optimise the ratio of information value/cost, and a mix of both permanent and temporary plots is recommended. The value of the NFA data will increase with every NFA cycle in order to capture information on trends. To ensure the continuity of the NFA it is important that it be institutionalised to maintain and strengthen the capacities of the NFA team, maintain the NFA database and the network of permanent sample plots.

The NFA findings help identify priority areas and will be of great use for the development of the forestry sector (national forest programme) and to evaluate forestry policy/strategies in order to ensure a coherent legislation. The NFA is part of a continual process and not the end product in itself.

1. Introduction

1.1. General

The United Nations Conference on Environment and Development (UNCED) was held at Rio de Janeiro, Brazil in 1992. Government of Bangladesh signed this Rio convention in 1992 and ratified the convention on May 03, 1994. The Rio convention explicitly has a provision stating that 'timely, reliable and accurate information on forests and forest ecosystems is essential for public understanding and informed decision-making' should be made available by the participating countries. As a signatory of CBD the Government of Bangladesh has the obligation to accomplish the required. Though the state owned forest areas, especially the 'Reserved Forests', have been inventoried from time to time, inventory of 'Forest Ecosystems' outside the Government owned forest have hardly been done. To secure information of all the possible land uses of the country as a whole with especial emphasis on "Forest Land Use", an inventory like that of National Forest Assessment (NFA) has been identified by FAO to be a better one.

The present NFA has adopted a set of globally harmonized terms and definitions to provide information. These may be used for the development of forest policies, forestry programs, over all forest management, sustainable development, conservation of the resources, etc. The definition of forest used by the Government of Bangladesh is not the same as the global definition of forest used by the NFA.

Since inception of FAO in 1948, it has been reporting on the worldwide status and trends of forest resources, their management aspects and uses. All countries are reflected in the process. The required data are collected and collated to prepare such report. The data may or may not be based on systematic inventory however. FAO, in an attempt to enhance the reliability of such data, launched this program of support to NFAs including the support to the present NFA of Bangladesh.

1.2. TAPP & FAO Support

Under this context a Technical Assistance Project Proposal (TAPP) was submitted in April 2004 by FD and in November 2004 it was endorsed by the Government of Bangladesh (GoB), (TAPP of MOEF, November 30, 2004.). The total cost estimate of the project was 27.054 million Taka (59 Taka = 1 US\$), out of which FAO-contribution was 20.768 million taka (equivalent to 352 thousand US dollar). The GOB contribution was 2.773 million Taka in cash and 3.513 million Taka in kind. The project was designated as "Strengthening Capacity to Generate Quality Information on Forest Resources", and initial planning activities started in July 2004. Several training activities were held from June 2005 to March 2006. Field data collection was carried out between November 2005 and May 2006 and the processing and analysis of collected field data was conducted during 2006 and the first half of 2007. Mapping activities undertaken by SPARRSO started in June 2006 and were completed in August 2007.

Table 1: The total cost break up of the NFA activities

FD Contribution in Kind	59,542 US\$
FD Contribution in Cash	47,000 US\$
FAO Contribution	352,000 US\$
Total	458,542 US\$

The long-term objective and approach is to build the national capacity, so that the national NFA program in Bangladesh continues in future with little or no external technical support, to generate the desired information. The core consideration of this program is to contribute towards the sustainable management of forests and trees, including those outside the areas designated as forest, by providing decision makers and stakeholders with the best possible and most relevant information. At the same time it is expected that this sort of inventory will generate the required data base that may be of good use at local, national and international levels. This NFA survey is thus a part of FAO's pilot program wherein Bangladesh has also been included.



Photo 1: Local food market in Dhaka, where also non-wood forestry products are put up for sale

2. Background

2.1. General History and Geography of Bangladesh

2.1.1. Historical context

Bangladesh came into existence only in 1971. This tract of land was under British rule from 1757 till August 14, 1947. This tract emerged as a wing of Pakistan, in 1947 as an independent country for the Muslims, and was designated as East Pakistan. It was liberated as Bangladesh in 1971 as an independent sovereign country. Forest management was however, initiated in Bangladesh during the British rule. The British crown for the first time promulgated Act VII in 1865 in connection with the Forests and Forestry and established a rule of law in this sector. This was the first forestry related 'Act' for this part of the world, the greater India which included the existing territory of Bangladesh. Many forest tracts were declared as "Reserved Forests" under this 'Forest Act' and were placed under the control of Forest Department for management.

2.1.2. Geographical context

Bangladesh lies in the north-eastern part of South Asia between 20°34' and 26°38' north latitude and 88°01' and 92°41' east longitude. The country is bounded by India on the west, the north and the northeast and Myanmar on the southeast and the Bay of Bengal on the south. The area of the country is 147.57 thousand km² and the population was in 2003 135 million (BBS, 2004), with a growth rate 1.43%.

Bangladesh has a sub-tropical monsoon climate with three prominent seasons in a year; winter, summer and monsoon. During winter (November to February) temperature ranges from 7° -13°C to 24°-31°C. Maximum temperature in summer up to more than 40°C or more. Monsoon (July-October) accounts for 80% of the total rainfall, 1,400-4,300mm. Except the hilly regions in the northeast and the southeast, some areas of high lands in the north and north-western part, the country consists of low, flat and fertile land. A network of rivers and their tributaries numbering about 23 with a total length of about 24,000 km covering the country flow down to the Bay of Bengal.

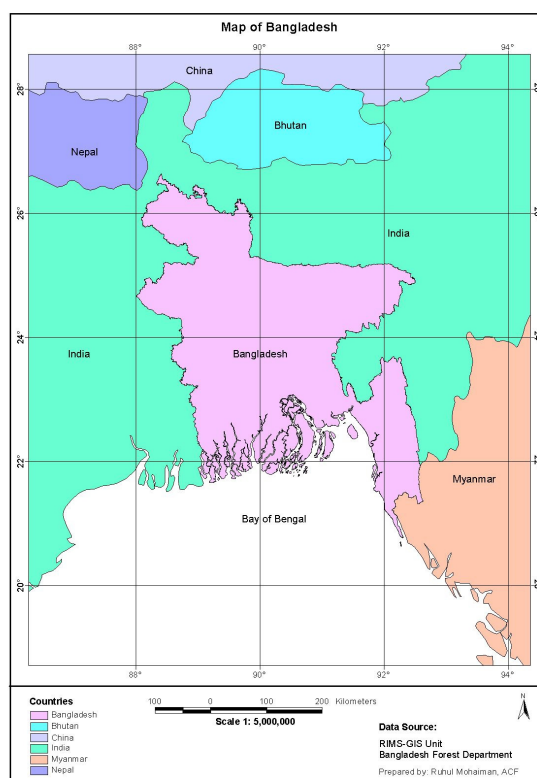


Figure 1: Location map of Bangladesh

2.2. Expressed need for the NFA

During the last decades a rapidly increasing population in Bangladesh with increased demand for resources and livelihoods, leading to a badly degraded environmental and natural resource base under serious threat from causing factors such as agricultural expansion, overexploitation of forest and tree resources, urban sprawl, overgrazing, quarrying etc.

Timely, easily available and accurate information on forest and tree resources and their utilization is a precondition for sustainable management of these resources based on an environmentally, socially and economically balanced forest policy.

The Government of Bangladesh (GoB) therefore requested the technical assistance of FAO under the Technical Cooperation Programme to assist the Bangladesh Forest Department to develop capacities to assess the country's forest and tree resources and to monitor trends and changes, to describe their nature and localities and to advise on adequate measures.

A broad knowledge on the forest and tree resources is critically needed for redefining the policy and strategy of the Forest Department as well as for developing a comprehensive National Forestry Action Plan (NFAP). The Government considers the formulation of its NFAP as a high priority after the work on the current inventory is concluded.

2.3. FAO support to the NFA

FAO has through the technical Cooperation Program (TCP) financed FAO technical assistance to the GoB. FAO LTU have had the overall technical supervision of project implementation and provided technical assistance to the GoB through national capacity building in the following main areas:

- Forest and tree inventory methodology development including sampling design, classification system harmonization and variables.
- Forest and land use mapping.
- Field survey
- Data processing, information system development and reporting
- Information management

The capacity building has been carried out through workshops, training events, on-the-job guidance, and through communication and feed-back.

The *FAO representation of Bangladesh* has as FAO project budget holder provided administrative assistance throughout the implementation of the various phases of the project. All Steering Committee Meetings were held at the FAO Representation

Till the launching of this NFA program, no inventory was carried out at a time all over the whole country with the same methodological approach to capture data on all the various land use patterns. The NFA approach is basically tagged with the land use aspects, with special emphasis to collect information on forests and tree resources, their uses and users, irrespective of its ownership, public or private. Thus for the foresters in Bangladesh this is a new approach.

2.4. Existing information on forests and ToF

Most of the existing Sundarbans was notified and declared as “Reserved Forest” during 1875-76. The existing ‘Reserved Forests’ in the greater district of Sylhet were declared as such under a similar Act, “Assam Forest Regulation” during the British Rule. Till 1914 there was neither any forest policy nor any Reserved Forest in this area of Sylhet. The policy of reservation of the Forest Area was first formulated on the basis of the note dated May 10, 1914 of Mr. G.C. Sankey an I.C.S. officer of the than British Government of India (Choudhury 1986). All most all of the existing “Reserved Forests” in the greater district of Sylhet were declared as such under Assam Forest Regulations. The forests of Chittagong and Chittagong Hill Tracts were declared 'Reserved Forests' in early 20th century during the British rule. Forest management followed such process of reservation.

Detailed inventories of various forests (notified forest land, mostly as ‘Reserved Forests’) under the control of the FD, Government of Bangladesh were under taken at various times especially for the preparation of Forest Management Plans. Since the major forest tracts are located in Sundarbans, Chittagong & Chittagong Hill Tracts, Sylhet. Dhaka-Tangail-Mymensingh, etc. forest inventories were under taken in these locations at different times.

2.4.1. The Sundarbans

The legal boundary of Sundarban forest (Bangladesh portion) covers an area of 577,000 hectares, out of which 401,600 hectares is land and the remaining 175,600 hectares is water bodies, as creeks, canals, rivers, etc. (Hossain & Acharya, 1994). F. Trafford wrote the first management plan for Sundarbans for the period 1912-13 to 1931-32. It is not known exactly how he carried out the inventory. The second management plan for Sundarbans was written by Mr. S. J. Curtis. It is learnt that he conducted the inventory and prepared the map by physical survey. His maps and inventory were milestones on this issue and were found to corroborate very closely with the high-tech inventories conducted at later ages. Curtis’ plan came into operation in April 1931. Forestal Forestry and Engineering International Limited of Vancouver, Canada carried out the first detailed inventory of Sundarbans in 1960. The second detailed inventory of Sundarban was done by Overseas Development Administration (ODA) of U.K. during 1980 to 85. The report was published in 1985. The Forestal and ODA inventories of the Sundarbans used blocks. Forestal divided the forest into 8 blocks which were also used by the ODA. The last inventory of Sundarbans was carried out in 1996 by FD, Government of Bangladesh. Of all the inventories so far carried out in Sundarbans, the three inventories namely that of Forestal, ODA and FRMP seem to be quite comprehensive.



Photo 2: Water transportation in the mangroves in the Sunderbans.

2.4.2. Sylhet Forests

Under a similar historical context, the forests in greater Sylhet were declared 'Reserved Forest' gradually since 1914 following the note initiated by Mr. G. C. Sankey, I.C.S. assistant commissioner to the then Government of Assam. As far as the records reveal, Mr. C. Purkayastha prepared a plantation scheme for the period from 1935 to 1938 for Sylhet area for the first time. Since then, the forests of Sylhet have been worked under one scheme or the other. The first working plan was prepared in 1938 by N.N. Das for the period 1938-1947. He conducted the inventory of the Forests in Sylhet by partial physical enumerations. He reported to have used the Topo-Sheets that were produced in 1930s. The maps that he generated during that inventory were based on those Topo-Sheets. The second management plan was written by M. U. Choudhury for the period 1963-64 to 1982-83. The next forest management plan for Sylhet was written by Dr. J.H. Choudhury for the period 1992-2001, using the FAO forest inventory data of 1984. That was a comprehensive forest inventory especially focused for managing the forests.

2.4.3. Forestal Forestry Engineering Inventory in Chittagong

Forestal Forestry and Engineering International Limited. Vancouver, Canada. (May 1964, Project No F334 under Colombo Plan, Pakistan, Canada) conducted the inventory in CHT and prepared the report, Chittagong Hill Tracts Forest Inventory Survey 1961-1963, Kassalong and Rankhiang Reserved Forests, Vol. 1, 2, 3 and 4.

This inventory was carried out using aerial photography with 8,500 sample plots checks on the ground. The main purpose of this inventory was to get a proper estimate of the timber and bamboo in the two main reserved forests of CHT namely Kassalong RF and Rankhiang RF.

2.4.4. Village Forest Inventory

The first village forest inventory in this part of the world was conducted by Mr. Hammer Master, under a FAO assignment. That report was published in October 1981. This report

reflected the timber volumes in the village area of Bangladesh and is based on sample survey.

2.4.5. Forestry Master Plan

Asian Development Bank (ADB) assisted the Government of Bangladesh to prepare a “Forestry master Plan” during 1991-93 for the period 1993-2013. FAO (UNDP), Sandwell Inc and Reid Collins Ltd. extended some support to this activity. The 20-year plan provides the framework to optimize the forestry sector’s contribution in stabilizing environmental conditions and assisting economic and social development.

3. Objectives of the study

The TAPP (Project Document) has identified two sets of objectives as Development Objectives and Immediate Objectives.

The development objective or the long term objective is as under :

The project aims at promoting sustainable management of the forests and trees resources in Bangladesh founded on policy that integrates and balance relevant environmental and social aspects of forestry. Sustainable management aims at enhancing the social, economic and environmental functions of forests and trees on the basis of better knowledge and at improving the contribution of these resources in the national economy.

The purpose of the TAPP is to enhance the capacity of BFD and contribute to achieve the development objectives through implementation of activities of the following specific objectives:

- Assist the Forest Department (FD) of the Ministry of Environment and Forest (MOEF) in developing and strengthening its capacity to collect, compile, process and disseminate reliable and up-to-date information on forestry, to policy makers.
- Assist the FD to plan and carry out national forest and tree resources inventory, develop up-to-date and sound base-line information and set up a long term resources monitoring system. The inventory will cover a large array of biophysical and socio-economic variables with emphasis on the management and use of the resources.
- Assist the FD in evaluating the findings, defining the sector priorities and outlining the national forest program.
- Advice and assist the Government to establish a long term monitoring of the national forest resources, take the necessary measures to maintain and support the National Forest Assessment Unit (NFAU), enable it to carry out continuous resource assessments in future and convert the project into a permanent program for long term monitoring and support to decision making.

4. Resources for the implementation of the NFA

4.1. General

This NFA was initiated with a number of consultation workshops and discussion meetings; wherein departmental as well as expatriate experts participated. The design of the methodology aims at harmonizing the reporting systems between countries, while satisfying the national information needs. The designing of the project outline, formulation of its implementation procedures, reformulation and development of the field manuals, finalization of the field forms, orientation and training of the FD personnel, etc. were the initial tasks to start the project. A remote sensing component for mapping was included by involving the Space Research and Remote Sensing Organization (SPARRSO) Dhaka, Bangladesh.

The project was designed for implementation in three phases as follows.

- Phase I: Preparation, Training and Mapping
- Phase II: Field Survey and Remote Sensing analysis
- Phase III: Data Processing, Analysis and Reporting

With these ground work the Inception Workshop of this project was organized by the FD during April 02 to 04, 2005 at Dhaka. The Inception workshop was facilitated by an NFA expert from FAO. In addition to that many experts and scientists from the following organizations attended and actively participated in that 'Inception Workshop' :

1. Ministry of Environment and Forests (MoEF), Government of Bangladesh.
2. Ministry of Planning, Government of Bangladesh.
3. Internal Monitoring and Evaluation Division (IMED), Government of Bangladesh.
4. Directorate of Environment (DoE), Government of Bangladesh.
5. Export Promotion Bureau, Government of Bangladesh.
6. Local Government Engineering Directorate (LGED)
7. Bangladesh Forest Research Institute (BFRI)
8. Space Research and Remote Sensing Organization (SPARRSO)
9. Bangladesh Bureau of Statistics (BBS), Government of Bangladesh.
10. Bangladesh National Herbarium, Government of Bangladesh.
11. Bangladesh Shongbad Shongstha (BSS) (The Press)
12. Bangladesh Agricultural Research Council (BARC)
13. Representative from Khulna University, Khulna.
14. Representative from Chittagong University, Chittagong.
15. Representative from Shajalal University, Sylhet.
16. Forest Department, Government of Bangladesh.
17. FAO Dhaka Bangladesh



Photo 3: Participants at the Workshop on “Needs and Requirements for the Strengthening of the Forest Department”

4.2. Analysis of the Remote Sensing Data

FAO Bangladesh established a Contract Agreement with the Space Research and Remote Sensing Organization (SPARRSO), Dhaka, Bangladesh in February 2006. The objectives of engaging SPARRSO was to generate statistics on the land use areas and also to provide FD with land use maps for the whole country, using the remote sensing data depicting all the land use classes that were identified and agreed upon for the purpose of the NFA. It was decided to procure the Landsat TM imageries (Band 3, 4 and 5) for the given purpose. FAO Bangladesh office facilitated the procurement of these imageries and in June 2006 SPARRSO received these imageries. In view of the real difficulties in identifying all the 27 land use types in the maps to be produced by SPARRSO, it was later agreed between the concerned parties that the following 14 land use classes should be identified and delineated in the land use maps (Inception report of SPARRSO, August 2006) to be produced by SPARRSO.

4.3. Setup of NFAU

According to the TAPP the Forest Department, Government of Bangladesh should setup a NFAU within the FD. The Chief Conservator of Forest vide his office order number 688/P dated 01-08-05 constituted a 15 member core team for this project and ordered them to function as member of NFAU. Thus the following members are expected to function as members of NFAU of FD.

Table 2 : Members of NFAU of FD

No.	Name	Designation and Position
1.	Mr. Ishtiaque Uddin Ahmed	DCF, DFO, Cox's Bazar, South.
2.	Mr. Zahir Hossain Khondaker	DFO, Management Plan Division, Dhaka
3.	Mr. Haradhan Banik	DFO, Management Plan Division, Chittagong
4.	Mr. Raihana Siddiqi	DCF, RIMS Unit, Dhaka
5.	Mr. Md. Tariqul Islam	ACCF, Management Plan Unit, Dhaka
6.	Md. Khayrul Alam Bhuiyan	ACF, Dhaka Forest Division, Dhaka
7.	Mr. Md. Sajjaduzzaman	ACF, Planning Wing, Ban Bhaban, Dhaka
8.	Mr. Mohammed Abdullah Abraham.	ACF, Development Planning, FD, Dhaka.
9.	Mr. Ruhul Mohaiman Choudhury	ACF, RIMS Unit, Ban Bhaban, Dhaka
10.	Ms. Shamima Begum Shiuli	RIMS, FD, Dhaka.
11.	Ms. Asma Islam	RIMS, FD, Dhaka.
12.	Mr. Sirajul Islam Gazi.	Management Plan Division, Dhaka.
13.	Mr. Mohammed Rafiqul Islam.	Establishment Unit, FD, Dhaka.
14.	Mr. Sushovan Anwar	Rims, FD, Dhaka
15.	Ms. Moni Adhikari	Development Planning, FD, Dhaka.

In addition to the above stated 15 personnel the following FD personnel have actively been involved with the process of data collection under the NFA activities (see Table 3).

Table 3 : List of Other Members of FD Closely involved with the NFA Activities

No.	Name	Designation and Position
1.	Mr. Uttam Kumar Shaha	DFO, WM & NC Division, Khulna
2.	Mr. Ratan Kumar Majumder	DFO, Management Plan Division, Khulna
3.	Mr. Quazi Md. Nurul Karim	ACF, Cox's Bazar South Forest Division, Cox's Bazar
4.	Mr. Modinul Ahsan	ACF, WM and NC Division, Sylhet
5.	Mr. Sheik Abu Tawhid	ACF, Social Forestry Division, Rangpur
6.	Mr. Md. Zahirul Haque	ACF, Tangail Forest Division, Tangail
7.	Mr. Md. Abdur Rahman	ACF, Dhaka Forest Division, Dhaka
8.	Mr. G. M. Rafique Ahmed	ACF, Social Forestry Division, Dinajpur
9.	Mr. Rajesh Chakma	ACF, Bandarban Forest Division, Bandarban
10.	Mr. Saleh Md. Shoyaib Khan	ACF, Sundarban East Forest Division, Bagerhat
11.	Mr. Shorof Uddin Ahmed	ACF, Social Forestry Division, Feni
12.	Mr. Manjurul Haque	ACF, Coastal Afforestation Division, Patuakhali

4.4. Study Tour

Mr. Md. Tariqul Islam, DFO, Management Plan Division, Khulna and Mr. Shorof Uddin Ahmed Chowdhury, ACF of Social Forestry Division, Feni, attended a study tour in the Philippines from August 8 to 20, 2005, to learn from the experiences gained during the NFA in the Philippines (2003-2005).

5. Field Survey Preparations

Survey of Bangladesh under the Ministry of Defense is the designated Government authority for Maps and Mapping. This organization produces topographic maps of 1:250,000 and 1:50,000 scale. The national territory of the country has been mapped in 267 numbers of Topo-Sheets at the scale of 1:50,000. In absence of Nation-Wide GIS data layered based maps for the whole of the country, Top-Sheets of 1:50,000 scale maps produced by the Survey of Bangladesh were used for this given work. The “Lat-Long” of the sample tracts were read from these Topo-Sheets. These Topo-Sheets were used for locating the tracts as well. These Topo-Sheets had the locations of the Thanas (/Upazilla, the lowest unit of Government administrative units) as well as the road net works. These features facilitated the physical location of the tracts during the field work. The sighting of the ‘Lat-Long’ Grid on these Topo-Sheets, along with all the other relevant physical features, facilitated with the use of hand held GPS and reading of the stored Lat-Long data from the GPS were used to reach and identify the desired location (especially the starting points of Tracts and Plots).

The systematically laid 299 tracts all over the country were identified to be within the 10 zones as indicated in Table 4. It has been aspired that these 299 tracts or samples will be revisited by reaching exactly the same locations using the GPS, maps, metal-detector (by locating the GI pipe already pegged below the ground level during the field survey) and personal knowledge.



Photo 4 : Team “F” in the Sunderban mangroves

Table 4 : Zone and Region wise numbers of Tracts used in NFA Survey

Zones	Area/Region	No. of Tracts
A	Dinajpur	37
B	Rajshahi	41
C	Mymensingh	35
D	Dhaka	30
E	Sylhet	26
F	Comilla	25
G	Chittagong	25
H	Hill Tracts	17
I	Khulna	33
J	Barisal	30
Total Tracts		299

Out of the original 299 tracts, two tracts (Tract number 61 and 294) were inaccessible and were therefore not inventoried, and one tract (Tract number 7) was excluded when it was found out that it was in the sea (outside the country’s land territory). Thus data from 296 tracts were collected ultimately.