



# BFRI

*at a Glance*



Government of the People's Republic of Bangladesh  
**Bangladesh Forest Research Institute**  
Chattogram, Bangladesh  
[www.bfri.gov.bd](http://www.bfri.gov.bd)

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Bangladesh Forest Research Institute (BFRI)  
P.O. Box. 273, Chattogram 4000, Bangladesh  
Phone: +88-023344-81577  
Email: director@bfri.gov.bd, director\_bfri@ctpath.net  
Web: www.bfri.gov.bd

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Dr. Md. Masudur Rahman  
Dr. Md. Mahbubur Rahman

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BFRI Technologies

# BFRI

## *at a Glance*

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# Bangladesh Map

## BFRI Head Quarter and Field Research Stations



### Location of BFRI Headquarter and Field Research Stations

- BFRI Headquarter
- ◆ Silvicultural Research Stations
- ▲ Seed Orchard Research Stations
- Minor Forest Research Stations
- ▲ Mangrove Research Stations
- ◆ Plantation Trial Unit Research Stations
- Regional Bamboo Research & Training Centre (RBRTC)





## Message

It is my pleasure to see the BFRI *at a Glance* has taken a praise-worthy step to compile its strength, role and contributions in the forestry sector both to the readers at home and abroad. It has now been more than half century since the establishment of Bangladesh Forest Research Institute (BFRI) that it has become the center of excellence spearheading forestry research for increasing the productivity of forest land through improved management of forest resources, forest protection, tree improvement, efficient utilization of forest produces, improving livelihoods of forest dependent people, economic growth and natural resource conservation. The mandate of BFRI is to undertake research in all aspects of forestry aiming sustainable productivity of forest land and forest industries, reduce the demand-supply gap on forest, increasing the benefits derived from trees and forest resources through conservation and sustainable management practices innovation. Our research is focused on the conservation of natural forest ecosystem; identification the sustainable management of plantation forests; species site suitability and managing trees on farms; developing and promoting the quality of forest products and services; providing integrated pest and disease management; tree improvement and germplasm conservation; plant tissue culture, bio-technology and molecular biology. We also address the emerging issues such as climate change and any other field identified by the stakeholders. We strive to share the information and developed technologies among the stakeholders, communities, foresters, scientists and others. We also provide technical advice and technology transfer in partnership, collaboration and cooperation with various government agencies, NGOs and private sectors. The knowledge gained from research conducted at BFRI will continue to enhance socio-economic benefits for forest management practices around the country and aid in forest policy decision-making. BFRI is dedicated to address current forestry issues, while providing the opportunity, under secure conditions, to investigate anticipated forestry issues that have yet to arise.

It's my great privilege to be the Director of BFRI just before the start of centenary celebrations of birth anniversary of the founding Father of Bangladesh. I envision our institute as part of a vital strategy to invest in emerging research field and more devoted to conduct, support and encourage extensive research on forest related application and services. I encourage your presence in our institute which is a mesmerizing gift of nature and inspired by the innovation, ambition and creativity. Hopefully this brochure will be helpful for the readers to get an insight about BFRI in brief.

**Dr. Md. Masudur Rahman**  
Director  
Bangladesh Forest Research Institute





# **Bangladesh Forest:**

## **An overview and Strategies**

Bangladesh extends over an area of 1,47,570 square km. It is bounded by India in the west, north and east; Myanmar in the southeast; and the Bay of Bengal in the south. The country, which is located between 20°34' and 26°38' north latitude and 88°01' and 92°41' east longitude, is a low-lying active delta, traversed by numerous branches and tributaries of the Ganges, Brahmaputra and Megna rivers. The country has approximately 2.6 million hectares of forest that account for 17.62% of the country's area, but only 10.84% of its land area is under the management of Bangladesh Forest Department. The forestry sector accounts for about 3% of the country's gross domestic product (GDP) and 2% of the labour force. However, these figures do not reflect the real importance of the sector in terms of monetary value. The per capita forest area in Bangladesh is less than 0.015 hectare against the world average of 0.60 hectare. Of the total forest area, 84% has been classified as natural forest and nearly 16% as plantation forest. The two most common types of forest, namely Hill forest and Mangrove forest cover more than 68% of total forest area. Privately owned village forests, also known as homestead forests totaling an area of 0.27 million hectares are scattered throughout the country. Almost all the village area (2.86 million hectares) is covered by trees of varying density and only a very small area has no tree cover at all. Although meager in size, an estimated 70% of timber, 90% of firewood, 48% of sawn and veneer logs, and almost 90% of bamboo requirements are met from homestead forests. Almost 50% of the area of Bangladesh has some kind of tree cover. More than 30% of the cultivated land has low percentage of tree cover. Late 1960, Bangladesh Forest Department (FD) started coastal afforestation programmes on the newly accreted coastal chars and offshore islands. In coastal areas, foreshore afforestation is a proven cost-effective method to dissipate wave energy and reduce floods on embankments during storm surges. Effectively acting as a barrier against gusts and storm surges, forests can save lives and protect communities vulnerable to climate change. Forests and trees are rooted in life and livelihoods. There are at least 19 million of people who are absolutely dependent on forests for their livelihoods in Bangladesh. There could be another 19 million who are dependent on forests in one way or another. Contribution of village forest income to total household income varied from 8.9% to 18.6%.

Bangladesh is a low CO<sub>2</sub> emitting country, but forest of Bangladesh is a rich repository of carbon. Bangladesh forests stocked a total 127.28 million tonnes carbon in above and below ground biomass including dead wood, litter and forest soil. Due to 32 cm Sea Level Rise (SLR), 84% of the Sundarban will be deeply inundated in 2050 and in 2100, for 88 cm SLR the whole of the Sundarban will be lost. Increased salinity intrusion due to sea level rise poses great threat to the Sundarban. The Sundarban has already been



affected due to reduced freshwater flows through Ganges river system over the last few decades particularly during the dry season. This has led to a definite inward intrusion of the salinity front causing the different species of plants and animals to be adversely affected. Increased salt water intrusion is considered as one of the causes of top dying of Sundri trees. The impact of sea level rise will further intrude the saline water to landward. SLR of 32 cm will intrude 10 to 20 ppt salinity level more in the Sundarban. The rate of salt water intrusion will also affect the ability of the ecosystem to adapt.

The primary challenge for sustainable forest management is finding ways to continue to benefit from ecological services without compromising the forest's ability to provide those services. Owing to such factors as over exploitation, conversion of forest land into agriculture, fire and grazing, forest resources in Bangladesh have been continuously depleting in terms of both area and quality. Between 1990 and 2015, Bangladesh annually lost 2,600 hectares of primary forest. Primary forest land gradually decreased from 1.494 million hectares in 1990 to 1.429 million hectares in 2015. Thus annual rate of deforestation in Bangladesh was 0.2% during 1990-2015.

In this context, the country has to face the challenge of climate change vulnerability and depleting forest resources. There is a need to reduce forest fragmentation, degradation and disturbances in order to facilitate the dispersal and migration of forest species from one place to another in response to climate change.

### **Performance of Forestry Sub-sector During 7<sup>th</sup> Five Year Plan**

- The forest sub-sector contributes to 1.6% of GDP and 12% of agricultural GDP.
- The sector grew at an annual average rate of 6.1% during the first four years the 7<sup>th</sup> FYP with the growth rates being more robust in the last fiscal year (8.3%).
- The total forest land in Bangladesh stood at 2,300 thousand hectares, which is around 15.58% of country area.
- The protected area increased from 11.56% to about 19.78% of the forest land during the 7<sup>th</sup> plan implementation period.
- A participatory social forestry got momentum involving surrounding poor peoples and forest dependent communities during the plan period.
- Coastal afforestation in newly accreted chars in the coastal areas was given due emphasis.
- Between 2009 and 2020, a total of 104 million saplings, 113.1 thousand hectares block plantation and 24,633 km strip plantation were raised.
- Till to date, about 701,488 poor people is involved in Social Forestry Programme. About BDT 1047.7 million distributed among 73,471. Social forestry participants (female participant 16,707) under the program during the plan period.



## Present Challenge of the Forestry Sub-sector

- Inadequate research back up.
- Lack of institutional set up for technology transfer activities.
- Problems in field research stations particularly encroachment.
- Limited career opportunities for the researchers.
- Land record and demarcation.
- Protection of forest and forest resources.
- Increase of productivity.
- Low per capita forest land.
- Lack of awareness.
- Lack of awareness about various services provided by the forest ecosystem.
- Regime shift in forest degradation.
- Lack of financing.
- Institutional coordination.
- Inadequate human resources and logistics.
- Absence of knowledge network, information system and learning.

## Policies and Strategies of Forestry Sub-sector Taken by the Government (8<sup>th</sup> Five Year Plan 2021-2025)

- Conservation of natural forests.
- Reforestation/restoration of degraded state forests.
- Coastal afforestation and creation of a coastal greenbelt.
- Management of protected areas and protection of wildlife.
- Promotion of fuel wood saving devices and technologies.
- Protecting and conserving the Sundarban.
- Strengthening forest & tree monitoring and information systems.
- Expanding social forestry and urban biodiversity.
- Conservation of hill forest areas.
- Strengthening institutional capacity.
- Strengthening forestry and biodiversity research.



# Bangladesh Forest Research Institute

Bangladesh Forest Research Institute (BFRI) is the only national institute which is mandated to conduct research on forest management and forest products utilization. It was set up as a Forest Products Research Laboratory (FRL) in 1955 by the Government of the then Pakistan. In 1965, this laboratory was provincialized and named as East Pakistan Forest Research Laboratory (EPFRL) to conduct research on the management of forest resources. The major objective of the FRL was to conduct research on the utilization of wood and wood products. Later, the need for forestry management research was felt by administrators and planners of the country due to rapid decline in stock density in forest land. Consequently in 1968, the Forest Management Research Branch was created and after the independence of Bangladesh the FRL was reorganized as BFRI. In 1985, the BFRI was separated from the Forest Department, and its administrative control went under the Ministry of Agriculture (MoA) and then in 1988 under the Ministry of Environment and Forest (MoEF). BFRI at present is administered by the Ministry of Environment, Forest and Climate Change, Government of the People's Republic of Bangladesh. However, BFRI is basically a component of the National Agricultural Research System (NARS). It has strong collaboration with forestry organizations and networks globally.

**Location:** Headquarter at Chattogram city.

**Land Area:** 1,100 hectare (including 28 hectare at Headquarter).

**Disciplines:** Eleven research divisions and one section under Forest Management Wing, Six under Forest Products Wing and two common service divisions.

**Field Stations:** 23 with a total area of 1072 hectare.

**Vision:** To achieve self-sufficiency in forest and forest resources.

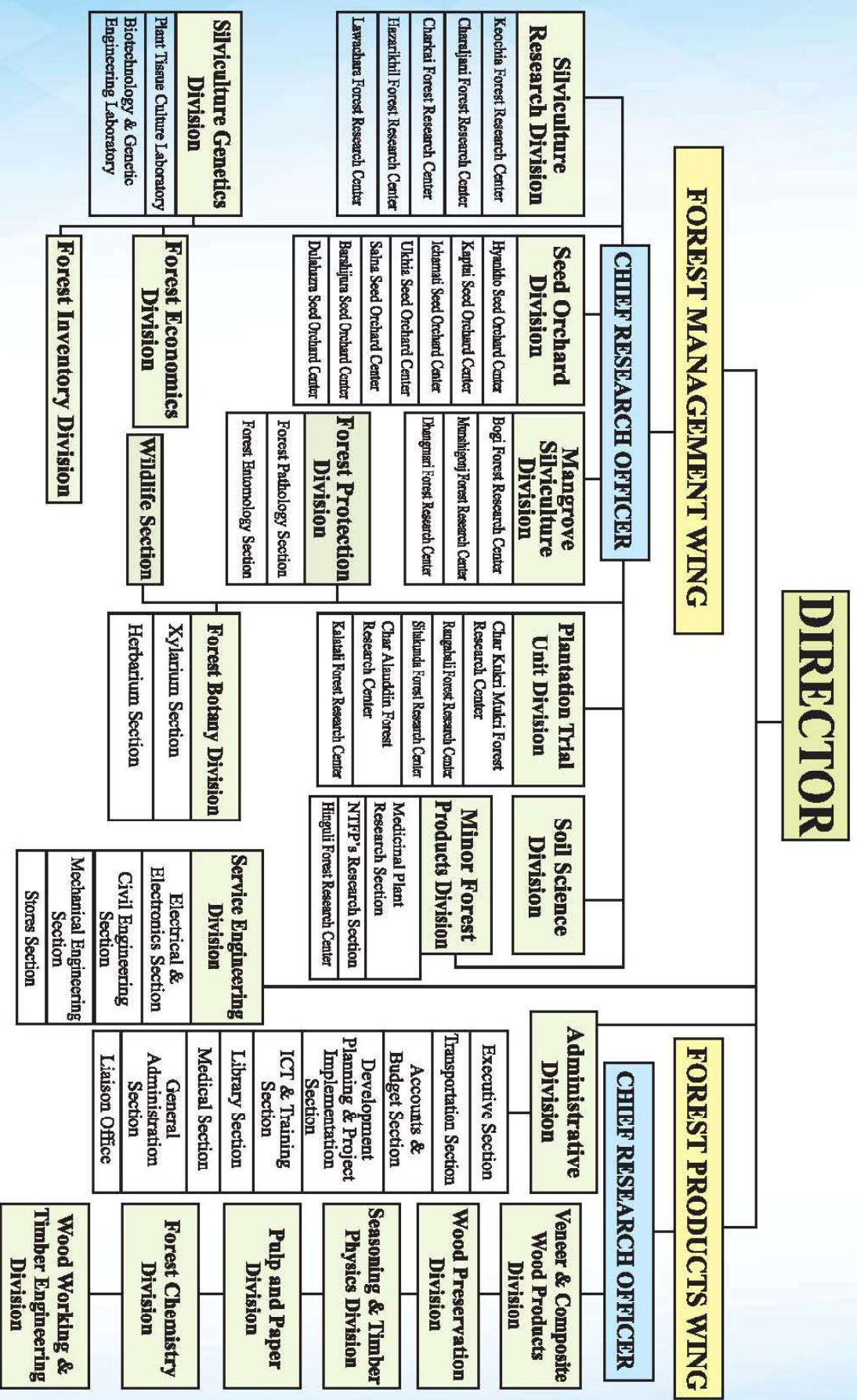
**Mission:** Proper utilization of forest resources and dissemination of developed technologies to the end users.

## Mandate

- Conducting research on forest management and forest products utilization.
- Maintain sustainable productivity of forest land and forest industries without resource depletion.
- Reduce the demand-supply gap of forest resources in Bangladesh.
- Provide research supports to the Forest Department (BFD), Bangladesh Forest Industries Development Corporation (BFIDC) and others in performing the forestry activities.
- Provide the current information on forestry research of the country with the data-base it has created and the technologies generated.



# Organogram of BFRRI



Total Manpower: ■ Sunctioned 769 ■ Existing: 396



## Advisory Committee

BFRI advisory committee consists of 17 members headed by the honorable Secretary, Ministry of Environment, Forest and Climate Change. The other members are from the different Ministries, Directorates and Departments of the Government and the representatives of Non Government Organizations. The committee is supposed to evaluate and approve the annual research report and programme of BFRI. It also examines the proposed annual budget and recommend for its approval. Besides, it has to ensure the dissemination of transferable technologies and evaluate the progress of any implementing development project. It also provide the guideline for developing short to long term forestry research projects as well as to improve the efficiency of the researchers.



Advisory committee meeting

## Technical Committee

The technical committee of BFRI consists of 13 members. The honorable Director is acting as the convener of the committee.



Technical committee meeting

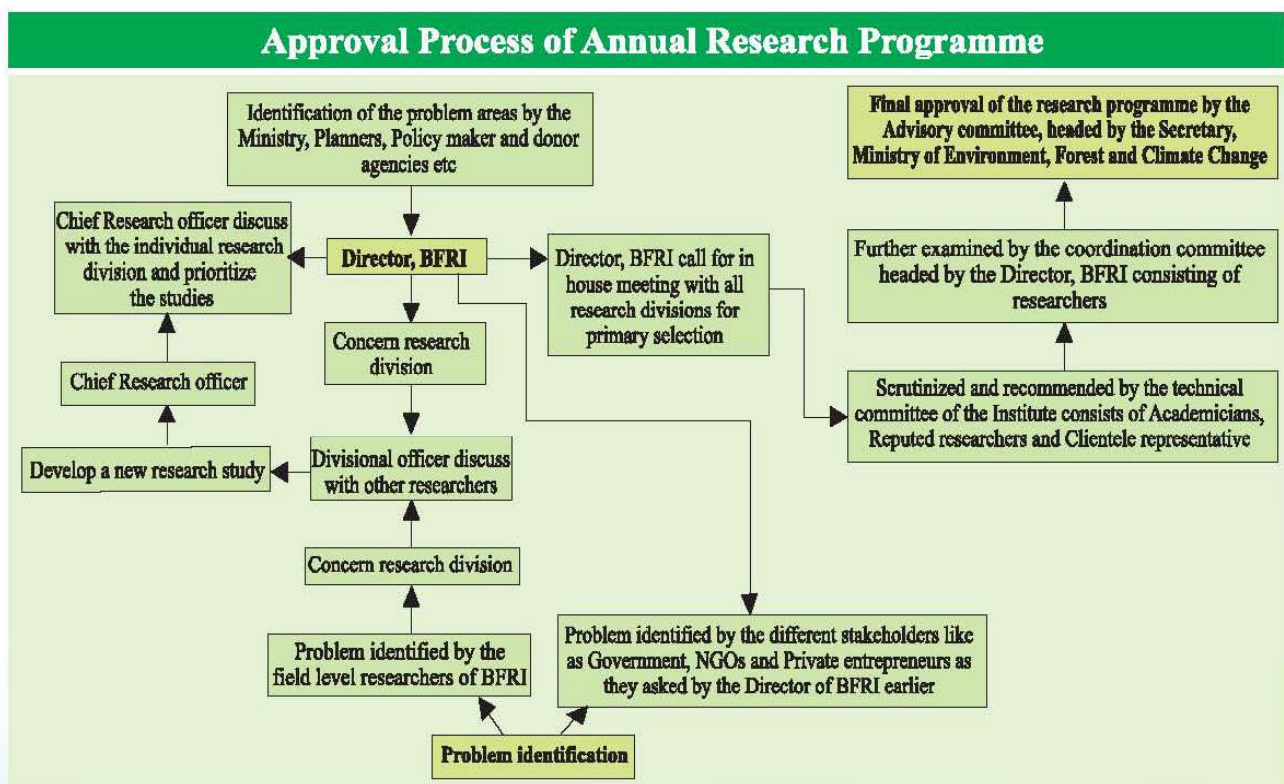
The members are the representative of Chief Conservator of Forest, Bangladesh Forest Department; Representative of Director General, Department of Environment; Member Director of BARC; Prof. Dr. Mohammad Kamal Hossain, IFESCU; Chittagong University,



Chief Research Officer, BFRI; Director, IFESCU; Chairman, Department of Zoology, Chittagong University, Director, BCSIR; Chief Research Officer, BARC; Representative of BFIDC and ADAB. The Chief Research Officer of BFRI, rolling as the member secretary of the committee. Technical committee evaluates the annual research programme and progress of BFRI.

## Research Priorities and Approval Process of Programme

Considering the different policies of the government, national demand and climate change research issues are prioritized. Demand driven research such as promotion of farm forestry and agro forestry, sustainable management of Sundarban and other coastal forest land, conservation of natural forests and biodiversity, restoration of degraded state forest. Both top down and bottom up approaches are used in problem identification. In the top down approach, the problem areas are reported by the administrators, planners, policy makers and donors. In the bottom up approach, the field foresters, wood based industries, NGOs and private entrepreneurs come up with their problems for solution. In addition to their own areas of research interest, the researchers take both these feedback approaches into consideration and propose research projects. The recommendations are again examined by a coordination committee consisting of researchers and clientele representatives, headed by the Director, BFRI. Annual research programmes are finalized by research Advisory Committee headed by the Secretary, MoEFCC. Integrated and multidisciplinary approaches are given priority in formulating the research projects.





## Linkage and Collaboration

BFRI maintains international linkage through the MoEFCC and BARC with IDRC, INBAR, ISME, FAO/UNDP, WB, IUFRO, SAARC, FORSPA, PORTIP, ADB, CIDA, SIDA, Winrock international, CIFOR, DANIDA, IPGRI, IRRDB etc. It works in cooperation with BFD, BFIDC, BRB, BCIC, DAE, BARC, Department of Environment (DE), Universities and other Institutions involved in land based production systems, wood based industries and environmental conservation. BFRI is specifically collaborating with NARS in the nationally coordinated Farming System Research (FSR). Mention worthy recent international collaborations is with International Rubber Research and Development Board (IRRDB). It is participating as the lead institute in the Species Improvement Network (SPIN) for bamboo in the region under UNDP/FAO regional project on improved productivity of man-made forests through application of technical advances in tree breeding and propagation. BFRI is also involved with INBAR in leading an international working group in bamboo production and genetic research.

## Research Wings and Divisions

Bangladesh Forest Research Institute has two research wings namely, Forest Management Wing and Forest Products Wing.

### Forest Management Wing

Research in the Management Wing is aimed at increasing the productivity of forest land through improved management, conservation of soil water, protection of trees from pests and diseases, tree improvement, etc. Mentionable achievements of the Forest Management Wing are site specific tree species selection, propagation of bamboos from branch cuttings, development of nursery techniques for seedling raising, etc. BFRI has pioneering contribution on artificial regeneration of mangrove species and raising of man-made mangrove plantations which at present cover about 0.2 million hectare land along the coastal belt of Bangladesh. The Forest Management Wing has the following eleven research divisions and a section.

- **Silviculture Research Division**
- **Mangrove Silviculture Division**
- **Seed Orchard Division**
- **Plantation Trail Unit Division**
- **Silviculture Genetics Division**
- **Minor Forest Products Division**



- **Forest Botany Division**
- **Forest Protection Division**
- **Soil Science Division**
- **Forest Inventory Division**
- **Forest Economics Division**
- **Wildlife Section**

Two research divisions i.e the Plantation Trial Unit and the Mangrove Silviculture are located at Barisal and Khulna district respectively, while the others are at the Head Quarter (HQ), Chattogram.

### **Forest Products Wing**

Research on scientific and efficient utilization of forest produces are the responsibilities of the Forest Products Wing. Major contributions of this wing are designing of a low-cost solar kiln for seasoning timber, devising of preservative treatment technique for rural housing materials, generation of technology for good quality pulp from inferior jute, classification of end uses of the lesser used and village wood species, etc. The Forest Department (FD), Department of Agriculture Extension (DAE), Bangladesh Forest Industries Development Corporation (BFIDC), Bangladesh Chemical Industries Corporation (BCIC), Bangladesh Tea Board, Chittagong Hill Tracts Development Board (CHTDB), NGOs and private entrepreneurs are the major clientele of BFRI. The Forest Products Wing has six research divisions.

- **Veneer and Composite Wood Products Division**
- **Wood Preservation Division**
- **Forest Chemistry Division**
- **Pulp and Paper Division**
- **Seasoning and Timber Physics Division**
- **Wood Working and Timber Engineering Division**

In addition, there are two common service divisions directly under the Director.

- **Administrative Division**
- **Service Engineering Division**

### **Field Stations**

BFRI has 23 research stations under five field divisions covering different forest types which spread over eight dendroecological regions of the country.



**Table: Details of Field Stations**

Sl. No.	Station & Sub-station	Location	Land Area (Acre)	Controlling Division
1.	Keochia	Satkania, Chattogram	1084.17	Silviculture Research Division
2.	Charaljani	Modhupur, Tangail	348.67	
3.	Charkai	Birampur, Dinajpur	191.15	
4.	Lawachara	Sreemangal, Moulvibazar	272.50	
5.	Hazarikhil	Fatikchari, Chattogram	141	
6.	Panerchara	Cox's Bazar Sadar, Cox's Bazar	50	
7.	Hinguli	Mirsarai, Chattogram	25	Minor Forest Products Division
8.	Hyankho	Fatikchari, Chattogram	180	Seed Orchard Division
9.	Kaptai	Kaptai, Rangamati	154	
10.	Ichamati	Rangunia, Chattogram	130.47	
11.	Dulahazara	Chakoria, Cox's Bazar	134	
12.	Ukhia	Ukhia, Cox's Bazar	04	
13.	Salna	Gazipur Sadar, Gazipur	60	
14.	Barshijura	Moulvibazar Sadar, Moulvibazar	10	
15.	Bagaihat	Marishya, Khagrachari	11.5	
16.	Bogi	Shorankhola, Bagerhat	10	Mangrove Silviculture Division
17.	Munshigonj	Shyamnagar, Satkhira	25	
18.	Dhangmari	Mongla, Khulna	1.29	
19.	Char Kukri Mukri	Char Kukri Mukri, Char Fashion, Bhola	1.0	Plantation Trial Unit
20.	Rangabali	Galachipa, Patuakhali	2.5	
21.	Sitakunda	Sitakunda, Chattogram	0.15	
22.	Char Alauddin	Sundharam, Noakhali	0.15	
23.	Khalatali	Cox's Bazar	0.21	



## Major Research Programme Areas

Research in the following broad programmes is conducted to achieve national goals in forest productivity, employment generation, environmental conservation and woman's participation in line with the Forestry Sector Master Plan of the country.

- Optimize productivity in hill, plain, village and coastal forests through the application of technological input to alleviate the poverty.
- Provide research backup to forestry and agroforestry in waste and marginal land for optimum and sustainable utilization.
- Rational utilization of forest products through the application of technological input.
- Help in conservation of biodiversity and environmental balance in national and rural forests.
- Increase liaison with regional and global organizations and network.

## Sources of Fund

Research is funded both from the revenue and development budget. The establishment expenditures are supported from the revenue budget of the Government of Bangladesh (GoB). Development activities including the research operational expenditures are covered from the development budget. The main contributors IDA, USAID, FAO/UNDP, IDRC, FORSPA and other international agencies.

## Monitoring and Evaluation

Each project is periodically monitored both internally and externally during its implementation. Institutional administration is responsible for internal monitoring while the external monitoring is done by a team of experts appointed by the MoEFCC, Bangladesh Agriculture Research Council (BARC); Implementation, Monitoring and Evaluation Department (IMED), Ministry of planning and the donor agencies.

## Highlights of Research Activities

### Forest Management Wing

- Tree improvement for sustained productivity.
- Establishment of clonal and seedling seed orchard and seed stand.
- Development of micro and macro propagation techniques of timber, non-timber and medicinal plant species.
- Molecular characterization of endangered forest tree species through DNA barcoding.



Genetic analysis of micro propagated plants for new genotypes or a new variety and conservation of plant genetic resources.

Development of nursery, plantation and silvicultural system of hill, plain and mangrove forests.

Socio-economic studies of plantation and village forestry and wood based industries.

Social forestry, agroforestry and village forests.

Development of integrated pest management system for forests and nurseries.

Land management for sustained productivity.

Ecosystem management and biodiversity conservation.

Bamboo and other non-timber forest products.

Wildlife management.



Micro propagation of plants



Bamboo propagation



Selection of plus tree



Sample plot in Sundarban



Regeneration plot in coastal forest



Conservation of medicinal plants



Absorption spectrophotometer



Silviculture research nursery



Forest inventory



## Forest Products Wing

Optimization of wood use for industrial and other purposes.

Wood seasoning for improving timber quality.

Increasing the durability of forest products using preservatives.

Industrial use of waste wood.

Development of improved method for pulp production and production of import substitute pulp from indigenous raw materials.



Treated bamboo house



Cement bonded particle house



Laboratory facilities, FCD



P&P laboratory facilities



Solar kiln



Wood seasoning

## Achievements

Research at BFRI is conducted to obtain increased productivity from the forest land and better utilization of the resources. A number of applied and adaptive researches have been conducted to minimize the gap between the demand and supply of forest produces. BFRI's database is rich enough to cater the present information needs FD in particular and the forestry sector in general. Mention worthy research achievements of the institute are listed below.

Simple technique for propagation of bamboo.

Technique for enhancement of service life of rural housing materials.

Site suitability assessment technique for planting tree species.

Technique for planting tree seedlings with minimum tillage and cost.

Coastal and mangrove plantation research. Established thirty three permanent sample plots of major mangrove species in five saline areas of Sundarban. Experimental plots have been established in Sundarban for the development of dieback tolerant varieties of Sundari trees.



- Development of tissue culture protocols of bamboos, timber and medicinal plants. TC protocols were developed for 14 bamboo species, 6 timber and 7 medicinal plants.
- Established the only bamboo germplasm center of 36 bamboo species at BFRI campus, Chattogram.
- Established a conservation plot of 300 medicinal plants at BFRI campus, Chattogram.
- Process for pulp from low grade jute.
- High yield pulp in conventional processes.
- Non-conventional timber for railway sleeper.
- Pests and diseases and their control measures.
- Volume, biomass, growth and yield of forest tree species.
- Keys for identification of important wood, forest tree, bamboo and canes.
- Evaluation of timber properties.
- Utilization of wood wastes.
- Characterization of timber.
- Contribution to forestry education.

## Technology Transfer

Results are disseminated through publication of reports, bulletins, scientific papers, popular articles, working papers and other mass media. Seminars, symposia and workshops are also organized for the field workers of government departments and private entrepreneurs. There are about 1,400 (last documented till 2020) research publications in the Institute. The institute publishes an internationally recognized half-yearly journal, Bangladesh Journal of Forest Science. In addition, extension materials on mature technologies are published as leaflets, folders and booklets for widespread circulation. BFRI also regularly feeds the Technology Transfer and Monitoring Unit of BARC and contributes at the District, Regional and National Technical Committee of DAE which enhances the Institute's technology transfer activities. Specifically, training courses such as propagation of bamboo, nursery techniques, pests and diseases management, preservative treatment of rural housing materials, wood identification, improved productivity of man-made forest, land capability assessment for site specific species selection, wood seasoning, wood technology, etc. are organized periodically. Over 6,000 individuals of FD, BFIDC, institutes of NARS, NGOs and common people have been trained so far in using these technologies. BFRI also offers consultative advice and technical services to different government and non-government organizations and persons related to forest production, management and utilization.

## Facilities

Bangladesh Forest Research Institute has developed facilities for research, education, extension and training. These facilities are open to all individuals and institutions.



## Laboratories

Laboratories are modestly equipped for conducting research of the Forest Products and Forest Management Wings. Besides, BFRI extends its laboratory facilities to the Institute of Forestry and Environmental Sciences and Institute of Marine Sciences, Chittagong University, Bangladesh Forest Academy, Khulna University, Dhaka University and other local and international institutions for teaching and research purposes.

## Library and Documentations

BFRI library is enriched with over 14,000 books, 3,500 bound volumes of national and international journals in 400 titles, 196 bulletins of BFRI, 30 dissertations/thesis of own scientists and innumerable research monographs, periodicals, newsletters, leaflets, folders, news, views and ideas. It regularly subscribes or collects 15 local and 30 international journals and periodicals, and exchanges publications with many universities and agencies throughout the world. The library renders information services to all of the scientists and officers of BFRI, different government offices/organizations/agencies including all departments of the affiliated ministry as well as to the students, fellows and faculty members of various public and private universities and to the NGO personnel. The library also provides CAS and SDI services to the respective government and non-government high officials, organizations and universities.



BFRI library

## Publications

An internationally abstracted forestry journal entitled “Bangladesh Journal of Forest Science” is being published from BFRI twice a year since 1968. Thirty-six volumes each of two issues have been published by 2020. In addition, research results are published as research papers in local, regional and international journals as well as in bulletins, working papers, folders, leaflets, booklets and newsletters.



# Herbariums

The herbarium of BFRI has a collection of 16,000 herbarium sheets and the xylarium has a collection of about 600 local and 1,600 foreign wood species. It also houses about 2000 fungal specimens.



Fungal herbarium



Herbarium



Xylarium

# Arboretums

## 1. BFRI Arboretum

The arboretum has 60 indigenous and 20 exotic timber species, 36 bamboo species covering 200 germplasms and 7 rattan species. A good number of medicinal herb, shrub and tree species has also enriched the arboretum.

**Plant Diversity in Arboretum of BFRI Campus**  
BANGLADESH FOREST RESEARCH INSTITUTE, CHITTAGONG

Sl. No.	LOCAL NAMES	SCIENTIFIC NAME	FAMILY	Sl. No.	LOCAL NAMES	SCIENTIFIC NAME	FAMILY
1	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	51	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
2	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	52	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
3	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	53	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
4	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	54	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
5	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	55	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
6	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	56	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
7	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	57	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
8	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	58	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
9	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	59	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
10	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	60	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
11	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	61	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
12	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	62	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
13	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	63	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
14	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	64	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
15	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	65	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
16	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	66	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
17	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	67	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
18	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	68	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
19	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	69	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
20	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	70	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
21	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	71	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
22	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	72	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
23	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	73	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
24	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	74	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
25	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	75	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
26	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	76	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
27	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	77	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
28	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	78	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
29	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	79	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
30	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	80	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
31	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	81	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
32	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	82	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
33	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	83	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
34	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	84	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
35	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	85	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
36	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	86	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
37	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	87	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
38	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	88	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
39	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	89	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
40	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	90	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
41	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	91	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
42	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	92	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
43	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	93	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
44	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	94	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
45	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	95	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
46	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	96	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
47	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	97	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
48	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	98	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
49	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	99	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae
50	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae	100	Amal	<i>Amorpha canescens</i> (L.) Desf.	Leguminosae

BFRI arboretum

## 2. Mangrove Arboretum

Under the initiative of the Mangrove Silviculture Division, 3 arboretums have been set up in 3 saline areas of Sundarban covering an area of 20 hectares and a total area of 60 hectares. The plan is aimed at conserving the major mangrove species, where teachers, students and researchers, including visitors, can get a better idea of the flora and fauna of Sundarban by traveling a short distance.





(a) Mangrove arboretum



(b) Mangrove arboretum of Munshigonj, Satkhira



(c) Fruit bearing in the Bhat kathi plant in the Dhangmari, Khulna Arboratum area



(d) Preserved forests in mangrove arboretum

## Museums

### 1. BFRI Museum

BFRI museum exhibits various uses of timber and important research aspects.



BFRI museum



## 2. Mangrove Museum

The Mangrove museum started its journey in 2001 at Mangrove Silviculture Division, Khulna of Bangladesh Forest Research Institute with twenty-five herbariums, including fifty-five flora and fauna specimens and twenty-three xylarium of the mangrove species. The Mangrove museum is essential for creating awareness among students, teachers, researchers and the general public through the preservation and display of flora and fauna specimens of Sundarban. It helps to protect and preserve the knowledge of Sundarban ecosystem. The museum helps teachers, students and researchers learn about the importance of Sundarban.



(a) Museum



(b) Mangrove xylarium



(c) Plant specimens



(d) Animal specimens



(e) Other specimens including tiger pugmark



(f) Dr. K. Akhter, Ex-Director visited MSD Museum

## 3. Insect Museum

An insect museum of BFRI has a collection of about 6,000 insect specimens collected from different forest areas.



Insect museum



## 4. Wildlife Museum

The wildlife museum has a collection of 68 specimens of 55 wildlife species.



Wildlife museum

## Awards Received

National Environmental Medal -2019

Prime Minister's National Award (Research and Conservation category)-2018  
(achievements in tree planting)

Prime Minister's National Award (Research and Conservation category)-2017  
(achievements in tree planting)



Prime Minister's National Award 2017



Prime Minister's National Award 2018



National Environmental Medal 2019



# Regional Bamboo Research and Training Center

Domar, Nilphamari

Bangladesh Forest Research Institute has established an individual bamboo Research and Training Center at Domar upazilla of Nilphamari district. It was a reflection of the desire of Honorable Prime Minister Sheikh Hasina in a discussion meeting with the Divisional Commissioner and District Commissioner to enhance the bamboo cultivation and utilization in the northern part of Bangladesh. Based on this, the Ministry of Environment, Forest and Climate Change (MoEFCC) approved the project “Establishment of Regional Bamboo Research and Training Center (RBRTC)” at Domar, Nilphamari. BFRI implemented the project and established the Regional Bamboo Research and Training Center in 2020. The Honorable Minister of Environment, Forest and Climate Change Mr. Shahab Uddin (M.P.) inaugurated the center on 15 February 2020.

## Major Activities of the Center

- Bamboo resource development in the northern part of Bangladesh.
- Sustainable utilization of bamboos.
- Value added product development.
- Technology dissemination to the end users.
- Improvement of socio-economic condition of the local people.

## Future Plan

- Develop local bamboo based entrepreneurs.
- Strengthening of collaboration with bamboo based local and international organizations and institutions to extend and develop modern technologies and exchange of knowledge.



Regional Bamboo Research and Training Center, Domar, Nilphamari



The cover features a central white area with the title text. This area is framed by a dark green vertical bar at the top and bottom. The left and right sides are decorated with light blue geometric patterns of overlapping squares. Large, flowing green shapes in various shades (from light to dark) curve across the middle and bottom of the page, creating a dynamic, organic feel.

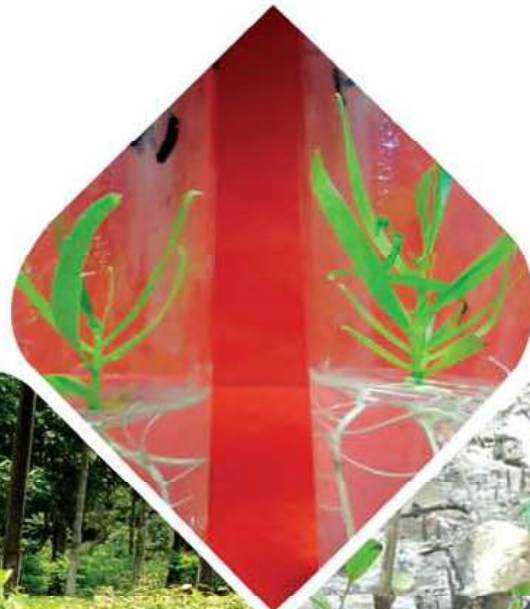
# **Brief profile of Research Divisions**







# Forest Management Wing









# Silviculture Research Division

**S**ilviculture Research Division is a pioneer research division of Bangladesh Forest Research Institute. It has a glorious journey in the forestry sector. Since the partition of “India” in 1947, all silvicultural research work in this region was conducted and supervised by the central Silviculturist, Dehra Dun. After partition, these works were handed over to the Divisional Forest Officer, Utilization. Later, a Silviculture Research Division was created in the year 1958 under the Forest Department. Around 1960, the headquarter of the division was transferred to the Bangladesh Forest Research Institute (BFRI), Chattogram for availing of laboratory facilities. Since 1968, the Silviculture Research Division has been conducting research in four research stations (Keochia, Satkania, Chattogram; Charaljani, Modhupur, Tangail; Lawachara, Sreemangal and Charkai, Birampur, Dinajpur) and three substations (Hazarikhil, Fatikchari, Chattogram; Hathazari, Chattogram and Pannerchara, Ramu, Cox’s Bazar) situated in different parts of Bangladesh.



Divisional office and nursery

The division also maintained a mangrove research station at Bogi in Sundarban but this was handed over to the newly created Mangrove Silviculture Division of BFRI in 1977.

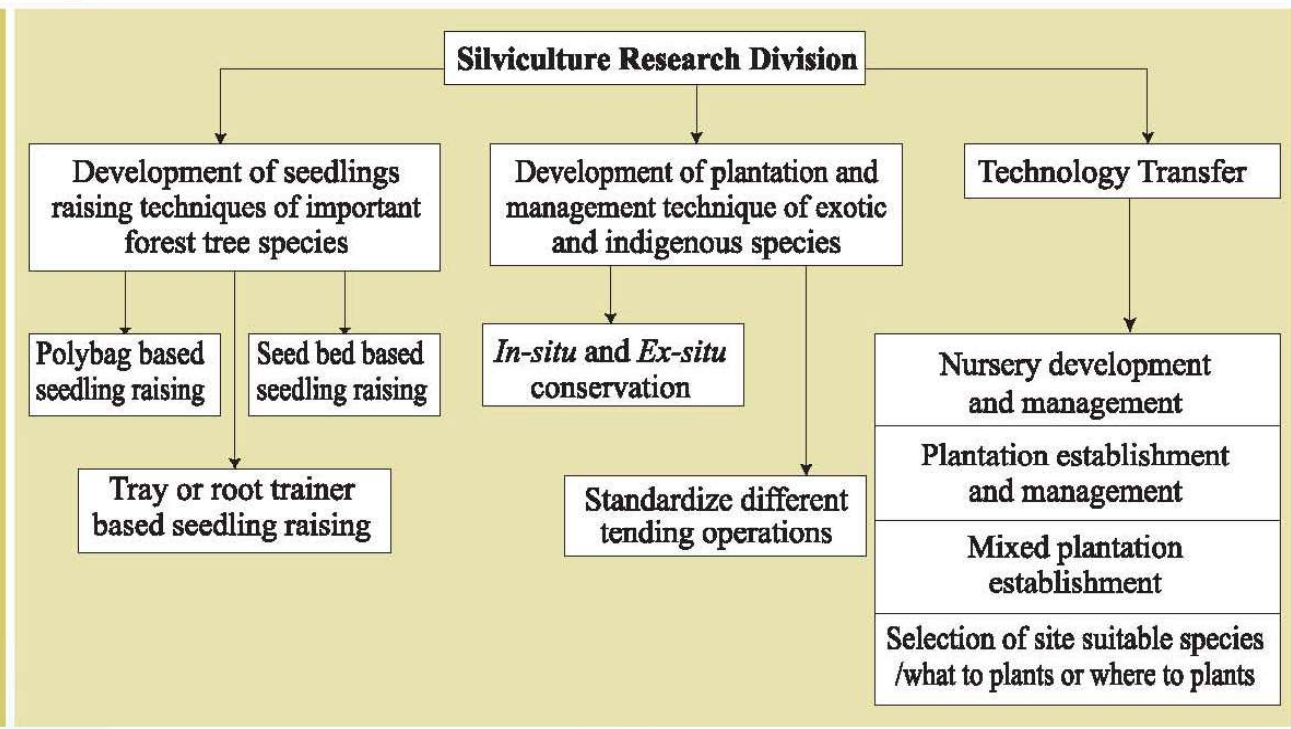
Until 1978, the research work was completely entrusted to Forest Rangers under the control of Divisional Forest Officer, Silviculture Research Division. In 1984-85, this division was placed under the administrative control of the Director, BFRI and the Ministry of Agriculture.



Since its inception, the Silviculture Research Division has been responsible for maintaining old sample plots and conservation plots by enhancing of regeneration and reforestation to keep the natural and artificial forest in sustainable productive. Initially, the work of the division was limited to extensive collection of seeds of indigenous tree species in order to improve seed supply within the country as well as to identifying, selecting and preserving mother trees (plus trees) to be used as seed sources. Also preserving rare and threatened species and finally manage the whole process up to harvesting in the field.

For the purpose of determination of the proper collection time and symptoms of maturity of seeds of important selected species some parameters on 25 indigenous mother trees were recorded in silviculture research stations based on the calendar of seed maturity. Two arboreta, one for tree species comprising 71 species and another for bamboos comprising 22 species have been established at the BFRI campus. These arboreta are providing data on adaptability and phenological behavior as well as material for taxonomical, cytological, genetical, physiological, morphological and other studies. To make the natural and artificial forest sustainably productive, it has been conducting or steering following different important research work through this division.

### Major Research Areas and Activities





## Developed Technologies

- Seedling raising and planting techniques of indigenous and exotic species.
- Development of coppicing maintenance system for fuel wood.
- Techniques of neem, sal, gamar, dhakijam, and gorjan by seedling stump and direct seed sowing.
- Seedling raising and planting techniques of muli bamboo from seeds.
- Development of cultivation techniques of broom grass.
- Seedling raising techniques in coccomoss media for export.
- Selection of site suitable important forest tree species.
- Coppice shoots rotation of *Eucalyptus camaldulensis* have been determined up to the second rotation.
- Growth performance and biomass production of *Gliricidia sepium*, *E. brassiana* and *E. tereticornis* and *A. mangium* provenance were determined.

## Introducing Exotic and Fast Growing Tree Species

Since 1980 important research work has been conducted at four Silviculture Research Station and three sub-station by planting exotic and indigenous species for the successful production of natural and artificial regenerated forest. Provenance of *E. camaldulensis* proved the best provenance out of 84 seedlots or provenances of 12 *Eucalyptus* species for fuelwood and pole production in Bangladesh. Among the 12 *Eucalyptus* species *Eucalyptus camaldulensis*, *E. brassiana*, *E. urophylla* and *E. tereticornis* were selected and *Pinus caribaea*, *Pinus oocarpa* has been selected from 27 provenance trial of pine. Nevertheless elimination, provenance, growth and pilot plantation of *Gliricidia sepium*, *Leucaenaleucocephala*, *Acacia auriculiformis*, *A. mangium*, *Casurina cunninghamiana*, *C. equisetifolia* Ges *Melaleuca*, Ipil-ipil, Poplar had been established. Introducing seedlings raising technique of important forest tree species in plain land as well as in low land. To enrich timber, pool and fuel wood production an alternative of segun species has been able to establish. An elimination trial was established for the production of low density timber species for the use of furniture, construction and fuel wood purpose.



Eucalyptus plantation at Charkai, Birampur, Dinajpur



Pine plantation at Keochia, Satkania, Chattogram



Akashmoni plantation at Keochia, Satkania, Chattogram



## Research on Bamboo

Through an IDRC-supported bamboo project, 20 different rhizome origins of six important species of bamboo viz. muli (*Melocanna baccifera*); mitinga (*Bambusa tulda*), makla (*B. nutans*) bariala (*B. vulgaris*), talla (*B. burmanica*) and borak (*B. balcooa*) were collected from different dendroecological regions of the country in 1981-1983. Rhizomes of these bamboo were planted in four silvicultural research stations. In 2006-2007, muli plantation was established through direct seed sowing and seedlings from seeds at four silviculture research station. Now it is a remarkable successful plantation of Silviculture Research Division which provide information on biomass production and carbon sequestration of muli bamboo plantation.

## Service Recognition

A memento was received from the Shanirvar Foundation on the occasion of the celebration of father of the nation Bangabandhu Sheikh Mujibur Rahman's birth centenary under the Prime Minister Tree plantation programme, 2020.

## Technology Developed and Dissemination

Silviculture Research Division has been organized various training program for the beneficiaries to disseminate its developed technologies for their well development. Among them, disseminated technologies are- Nursery development and management, Plantation establishment and management, Mixed plantation establishment and selection of site suitable species. Silviculture Research Division has not only disseminate its technologies and research activity but also sharing knowledge in national and international conferences and published as journal articles in national and international journals.

## Current Research Focus

Current research programs are focused on production of quality planting materials, plantation techniques and forest management. To lessen forest pressure on timber species as well as save the threatened indigenous species, the division has taken study to develop easiest nursery techniques of indigenous forest tree species like goda, batna, kanak and parul for successful plantation and also impart research on to use fuel wood as alternative of timber species without harvesting the useful timber species in Bangladesh.

## Future Plan

Sustainable forest management and easiest nursery techniques will be developed and plan to increase the forest productivity as well as minimize the climate change to achieve the continuity of our future plan.

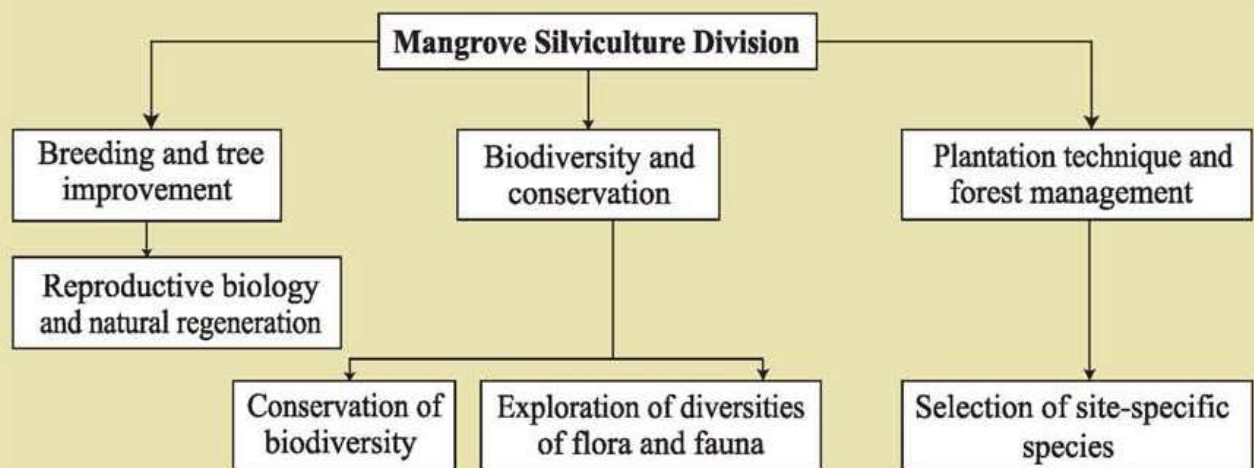


# Mangrove Silviculture Division

**M**angrove Silviculture Division is a notable division of Bangladesh Forest Research Institute. This division was established in 1977. Munshi Anwarul Islam, former Chief Conservator of Forests, opened the door of research on 7<sup>th</sup> June 1977 as the then Divisional Forest Officer, the founder of the department. The Mangrove Silviculture Division is conducting continuous research on Sundarban.

## Major Research Areas and Activities

Mangrove Silviculture Division of Bangladesh Forest Research Institute has been raising nurseries of various mangrove species since 1977. Nursery is raised by collecting quality seeds or propagules from healthy and improved mother tree. The seeds or propagules are collected from various species such as the sundari, jhana, vathkathi, dhundul, passur, khalsi, golpata, keora, moth goran etc. species every year.



Top dying of sundari



Mangrove nursery in Sundarban



Experimental plot in Sundarban





Dr. Shahin Akhter, Ex-Director, BFRI visited mangrove nursery in Sundarban



Dr. Md. Masudur Rahman, Director, BFRI visited mangrove nursery in Sundarban

### **Observation of Plants Growth through Permanent Sample Plots (PSPs)**

In this era of increasing scientific advancement, permanent sample plots are important in the study of forest research. Following this, Mangrove Silviculture Division conducted research activities by establishing twelve permanent sample plots of Sundarban in 1977. At present there are a total of thirty-three permanent sample plots in this division. The Permanent Sampling Plot of 400m<sup>2</sup> area has been divided into three quadrats in order to gain a scientific understanding of the flora and fauna of Sundarban on a regular basis.

### **Selection of Superior Mother Trees and Production of Quality Seeds**

Mangrove Silviculture Division has been producing improved mother trees through experimental plantation from circumcised, vigorous, disease free seeds for various research works. The seed and propagules are collected from Myler Chattar, Noshur Jhola, Holar Char, Takimari, Bogi, Bholar Par, Terabaka, GamarKhal, Munshiganj, Katka, Alki, Pashur Khal, Andarmanik, Gazir Khal, Kadamtala, Burigoalini and Khasitana at Sundarban.

### **Experimental Plantation of Mangrove Forests**

There are three research stations under the Mangrove Silviculture Division namely Dhangmari forest research station, Dakope, Khulna; Bogi forest research station, Sharankhola, Bagerhat and Munshiganj forest research station, Shyamnagar, Satkhira and experimental plantations have been raised in each research station.





Trail plantation of Khalshi (*Aegiceras corniculatum*) in Sundarban



Trail plantation of Sundari (*Heritiera fomes*) in Sundarban



Trial plantation of Bhatkathi (*Kandelia candel*) in Sundarban



Experimental plantation of Kirpa (*Lumnitzera racemosa*) in Sundarban

### Non-Mangrove Research Activities

A total of 19 non-mangrove species were experimentally planted at 16 locations in 1982 and 1992. The results showed that out of 19 non-mangrove species babla, jarul, rain tree and sada koroï were the most successful species for afforestation.

### Climate Change and Ecological Research Activities on Biodiversity Conservation

Mangrove Silviculture Division is conducting research on climate change, ecosystem and biodiversity conservation in this deltaic region adjoining Sundarban.

### Effect of Salinity and Sedimentation on Seedling Growth and Vegetation

Mangrove Silviculture Division has been monitoring the salinity and sedimentation of seedlings and vegetation in Sundarban through the establishment of Permanent Sample Plots (PSPs). At present, there are 33 PSPs in this division.



Through PSPs, it is possible to determine species, the natural reproduction rate of major mangrove species, plant diversity and evaluate the effects of salinity and sedimentation on plant diversity.

### **Conservation of Endangered Mangrove Vegetation**

Initially 3 arboretums have been set up in 3 saline areas of Sundarban covering an area of 20 hectares and a total area of 60 hectares. The plan is aimed at conserving the major mangrove species, where teachers, students and researchers, including visitors, can get a better idea of the flora and fauna of Sundarban by traveling a short distance. Mangrove Silviculture Division has continued its efforts to innovate various technologies since its inception. The nursery techniques of major species of Sundarban, development of planned forestry techniques in the affected areas of Aila, techniques of Golpata and Khalsi in coastal areas, afforestation techniques on river bank and new charland, techniques of mangrove species in coastal low vegetation areas including Sundarban are notable technologies invented by Mangrove Silviculture Division.

### **Current Research Focus**

Current research activities are underway to achieve 13.1 of 13 Sustainable Development Goals. In order to combat the effects of climate change, mangrove afforestation, conservation of endangered plants, afforestation of mangrove species in the charland areas adjacent to Sundarban and the establishment of mangrove arboretum.

### **Future Plan**

Efforts are being made to carry out more modern and up-to-date research activities. Research on the causes and remedies of Sundari's Top Dying disease, salt tolerant mangrove species, increase in research on carbon assimilation. In addition, efforts are underway to conduct research on plants that survive the rising sea level.