

Designing a Co-management Model for Protected Areas in Bangladesh



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Forests of Bangladesh: An Overview

The total area of forest land is 2.53 million hectares representing about 17.5% of the country's area. Bangladesh Forest Department manages 1.53 million hectares of forest land. Following is a description of the forest area of Bangladesh and forest land managed by the Forest Department.

Table 1: Forest Area of Bangladesh

Forest types	Area (m. ha.)	% with respect to country's area
FD managed Forests	1.53	10.54%
Un-classed State Forests	0.73	5.07%
Village Forests	0.27	1.88%
Total	2.53	17.49%

Table 2: FD Managed Forest Land

Forest Types	Area (m. ha.)	% with respect to country's area
Hill Forests	0.67	4.65%
Natural Mangrove Forests	0.60	4.09%
Mangrove Plantations	0.14	0.97%
Sal Forests	0.12	0.83%
Total	1.53	10.54%

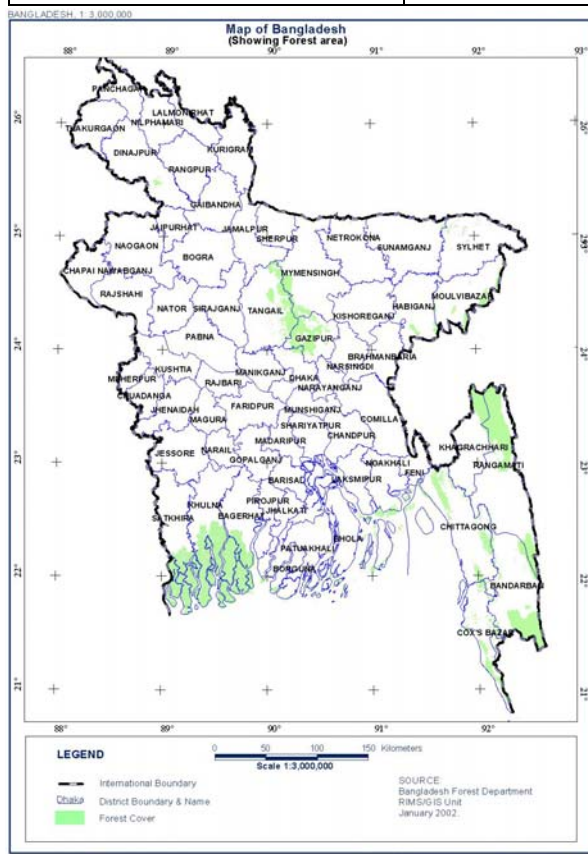


Fig 1: Map showing Forest Areas of Bangladesh

Forest Types

Bangladesh as a nation inherits the legacy of an eternal and colourful past and tradition. The forest cover, flora and fauna, and a smoothing natural environment is mingled with our tradition. Different regions of Bangladesh manifest different natural heritage. In the south-western region of the country there lies the great forest of Sundarbans, the Shalban in the middle and the evergreen hill forests in the South-East. A great variation in flora and fauna develop a different and distinct ecosystem, a brief of which is presented here.

Table 3: Forest types of Bangladesh

Forest Types	Total area (m.ha.)	Area under tree cover (m.ha.)	% of total land under tree cover
Hill Forest	1.40	0.33	2.3
Mangrove Forests	0.74	0.46	3.2
Sal Forests	0.12	0.05	0.3
Village Forests	0.27	0.27	1.9

Mangrove Forests

Natural Mangrove Forests

- Sundarban is the unique largest tract of mangrove forests.
- The total area of Sundarban is 6,01,700 hectares, which is 4.16% of the total area of Bangladesh and 40% of the forest land managed by the Forest Department.
- Sunderban contains 334 species of trees, shrubs, climbers, etc and 269 species of wildlife.
- Sunderban is treated to be the treasure house for the world famous Royal Bengal Tiger. The Sunderban World Heritage site is composed of three wildlife sanctuaries such as East Wildlife Sanctuary, South Wildlife Sanctuary and West Wildlife Sanctuary. The total area of the World Heritage site is 1,39,700 hectares.
- Forest inventory in 1998 estimates 12.26 million cubic meters of wood resources (15cm and above dbh) from trees of Sundri (*Heritiera fomes*), Gewa (*Excoecaria agallocha*), Keora (*Sonneratia apetala*) and Passur (*Xylocarpus mekongensis*) species.
- Of all the tree species Sundri (*Heritiera fomes*) is the most important one which occupies 73% of Sundarban. Sundri is followed by Gewa (*Excoecaria agallocha*), Baen (*Avicennia officinalis*), Passur (*Xylocarpus mekongensis*) and Keora (*Sonneratia apetala*). There are numerous minor forest produces such as golpatta (*Nypa fruticans*), honey, bee's wax, fishes and others.
- The Sundarban is famous for some of the important animal species. Important mammals include Royal Bengal Tiger (*Panthera tigris tigris*), Gangetic Dolphin (*Platanista gangetica*), Rhesus Macaque (*Macaca mulatta*), Indian fishing cat (*Felis viverrina*), Indian otter (*Lutra prespicillata*) and Spotted deer (*Axis axis*). Of the reptiles Estuarine crocodile (*Crocodylus porosus*), Monitor Lizard (*Voranus salvator*), Rock Python (*Python molurus*) and Green turtle (*Cheoria mydas*) are important ones

Mangrove Afforestation

- Indigenous technology developed by the Forest Department.
- Mangrove afforestation programme supported by GOB (Government of Bangladesh) fund was
- launched by the Forest Department in 1960-61 in the coastal districts of Bangladesh. It gained momentum from 1965-66 through implementation of different development projects in the coastal embankments, chars and islands
- From its initiation in 1960-61 till 1999-2000, 1,42,835 hectares of mangrove plantation have been raised under coastal afforestation projects.

Hill Forests

- Total Area of Hill Forests is 6,70,000 hectares, which is 4.65% of country's area and 44% of total forest land managed by the Forest Department.
- Hill Forests spread over the hilly areas of Chittagong, Cox's Bazar, Sylhet and Chittagong Hill Tracts.
- Based on the topography, soil and climate, Hill Forests can be classified into (a) Tropical Wet Evergreen Forest and (b) Tropical Semi-Evergreen Forest.
- Hill Forests are rich in diverse varieties of flora and fauna.
- Garjan (*Dipterocarpus spp.*), Chapalish (*Artocarpus chaplasha*), Telsur (*Hopea odorata*), Tali (*Dichopsis polyantha*), Kamdeb (*Calophyllum polyanthum*), Jarul (*Lagerstroemia speciosa*), Uriam (*Mangifera sylvatica*), Civit (*Swintonia floribunda*), Toon (*Toona ciliata*), Bandarhola (*Duabanga grandiflora*), etc. are the principal species in the natural hill forests. Besides, bamboo, cane, climber, fern etc. are also found in the hill forests.
- Plantations have been in continuation in this forest area since 1871. At present plantation programmes are being implemented on a massive scale under different development projects. Important plantation species include Teak (*Teaktona grandis*), Gamar (*Gmelina arborea*), Mehogony (*Swietenia spp.*), Chapalish (*Artocarpus chaplasha*), Jarul (*Lagerstroemia speciosa*), Sal (*Shorea robusta*), Koroï (*Albizia spp.*), Chickrashi (*Chichrassia velutina*), Lohakat (*Xylia dolabriformis*), Kadam (*Anthocephalus chinensis*), Telsur (*Hopea odorata*) etc. According to the latest forest inventory hill forests have a growing stock of 23.93 million cubic meters of wood.
- Important mammals include Elephant (*Elephas maximus*), Rhesus Macaque (*Macaca mulatta*), Wild Pig (*Sus scrofa*), Barking deer (*Muntiacus muntiak*), Sambhar (*Cervus unicolor*) and Indian Leopard (*Panthera pardus*). Of the reptiles King Cobra (*Ophiophagus hannah*), Monitor Lizard (*Caloted versicolor*), Bengal Monitor Lizard (*Varanus begalansis*) are common.

Sal Forests

- The total area of Sal Forest is 1,20,000 hectares, which is 0.83% of country's area and 7.9% of forest land managed by the Forest Department.
- Sal forests spread over the Central and Northern districts of Bangladesh. These forests are scattered in nature and intricately mixed with habitations.
- Sal forest is classified as Tropical Moist Deciduous Forest.
- Sal (*Shorea robusta*) is the principle species. Other species include: Koroi (*Albizia spp.*), Ajuli (*Dillenia pentagyna*), Sonalu (*Cassia fistula*), Bohera (*Terminalia balarica*), Haritaki (*Terminalia chebula*), Kanchan (*Bauhinia acuminata*), Jarul (*Lagerstroemia speciosa*), Jam (*Syzygium spp.*) etc.
- According to an inventory estimate, Sal Forests have a growing stock of 3.25 million cubic meters of wood.
- A massive plantation programme under Social Forestry programme is in progress on the basis of benefit sharing mechanism.
- Important mammals include Jackal (*Canis auveus*), Bengal Fox (*Vulpes bengalensis*), Rhesus macaque (*Macaca mulatta*), Jungle cat (*Felis chaus*). Of the reptiles Bengal monitor lizard (*Varanus bengalensis*) and Common Cobra (*Naja naja*) are important ones.

Reed-Land Forest

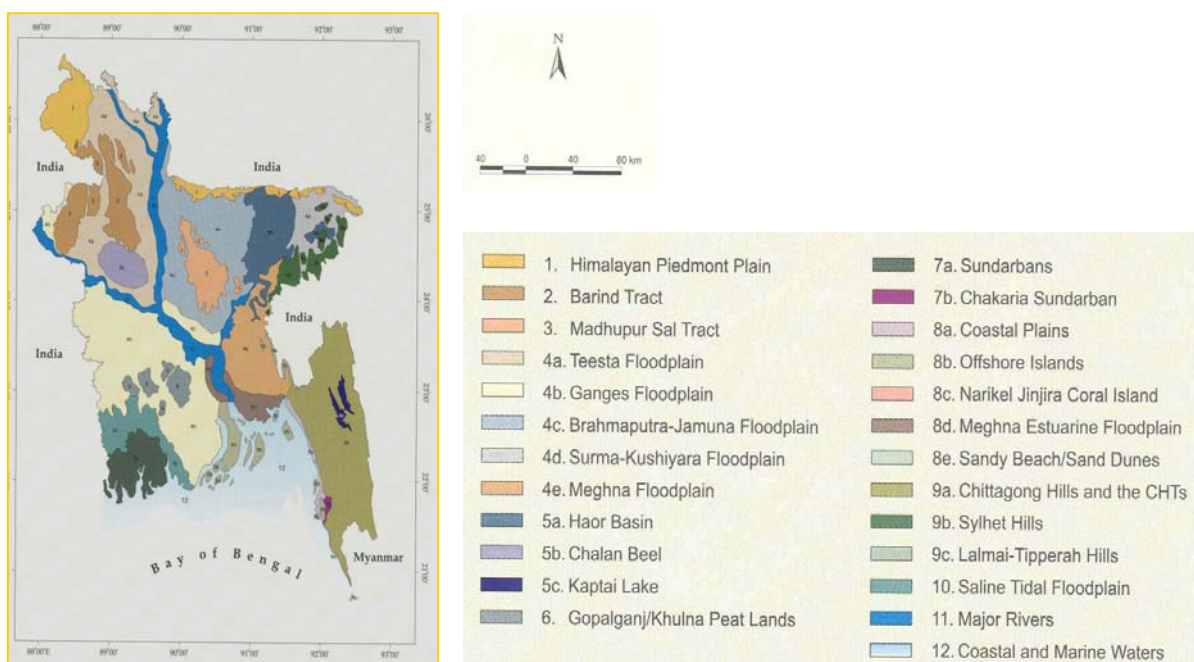
- The reed-land forest situated in Sylhet comprises a total area of 23,590 hectares.
- The forest ranges from swamp forest to mostly reed or Nal (*Phragmites kraka*), Kash (*Saccharum spontaneum*) and Ikra (*Saccharum ravinae*) and in some areas there are also permanent water bodies.
- The reed-land areas are also very rich in faunal diversity.
- A survey reported 27 mammals, 49 birds 22 reptiles and 9 amphibians from the reed-land forest.
- All of them are used as food, medicine, bait, for commercial trade and recreation.
- The reed-land flood plains are also rich in fisheries resources.
- Due to indiscriminate harvesting, the reed populations are declining.
- The rate of depletion is as high as 60 per cent in particular areas.

Homestead Forests

- The tree cover in village forest is 2,70,000 hectares.
- A reasonable portion of the total demand of forest produces is being met from homestead forest.
- According to the latest inventory report the village woodlots have a growing stock of 54.7 million cubic meters.

Bio-ecological Zones

Bio-geographically Bangladesh is situated in the transitional point between the Indo-Himalayan and Indo-Chinese sub-regions of the Orient. As a result Bangladesh enjoys a number of diverse eco-systems and their associated richness of plants and animals. Nishat et.al. 2002 divided Bangladesh into twenty-five bio-ecological zones using parameters like physiography, climate (rainfall and temperature), soil type, flooding depth, floral and faunal distribution (Nishat et.al. 2002).



Source: Nishat, et.al. 2002

Fig2: Bio-ecological zones of Bangladesh

Protected Areas of Bangladesh

For conserving bio-diversity and natural environment of all forest types and bio-ecological zones 16 protected areas have been established so far according to the provision of Bangladesh Wildlife preservation order, 1973 covering an area of 2,41,675 hectares (Table 4).

Table 4: List of Protected Areas

A	NATIONAL PARKS	Forest types	Bio-ecological zone	Area (ha.)	Established
1.	Bhawal National Park	Sal forest	3	5,022	1974/1982
2.	Modhupur national Park	Sal forest	3	8,436	1962/1982
3.	Ramsagar National Park	Sal forest	1	27.75	2001
4.	Himchari National Park	Hill forest	9a	1,729	1980
5.	Lawachara National Park	Hill forest	9b	1,250	1996
6.	Kaptai National Park	Hill forest	9a	5464.00	1999
7.	Nijhum Dweep National Park	Coastal mangrove	8b	16352.23	2001

	8.	Medha kachapia National Park	Hill forest	9a	395.92	2004
B.		WILD LIFE SANCTUARIES				
	9.	Rema-Kalenga Wildlife Sanctuary	Hill forest	9b	1795.54	1996
	10.	Char Kukri-Mukri WS	Coastal mangrove	8b	40	1981
	11.	Sundarbans (East) WS	Natural mangrove	7a	31226.94	1960/1996
	12.	Sundarbans (West) WS	Natural mangrove	7a	71502.13	1996
	13.	Sundarbans (South) WS	Natural mangrove	7a	36970.45	1996
	14.	Pablakhali WS	Hill forest	9a	42087	1962/1983
	15.	Chunati WS	Hill forest	9a	7761	1986
		GAME RESERVE				
C.	16.	Teknaf Game Reserve	Hill forest	9a	11615	1983

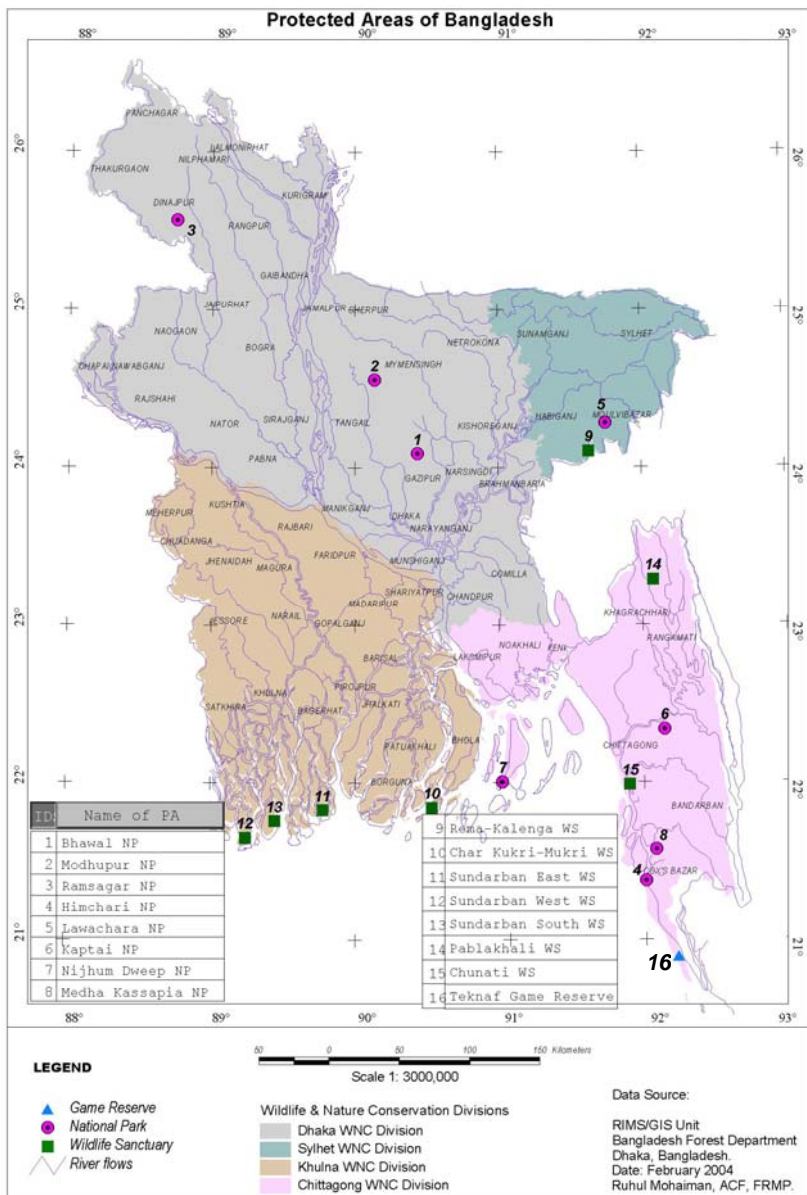


Fig3: Map of Protected Areas of Bangladesh

Bio- Diversity

Because of its geographical settings and climatic, characteristics, Bangladesh is very rich in floral and faunal diversity, Table below gives an idea about extent of bio-diversity in Bangladesh.

Table 5: Extent of Biodiversity

Category	Total number of species
Flora	
Angiosperms	5000
Gymnosperms	5
Algae/Seaweed	168
Fauna	
Sponges	3
Corals	66
(Marine + Freshwater) Mollusks	(336+26)362
Insects	2493
Mites	19
Shrimp/prawns	56
(Marine + Freshwater) Crabs	(11+4)15
Lobsters	3
Echinoderms	4
(Marine + Freshwater) Fish	(442+266)708
Amphibians	22
(Marine + inland) Reptiles	(17+109)126
Birds	628
(Marine + inland) Mammals	(3+110)113

Source: MoEF 2002

Major threats

Major threats to protected area as well as biodiversity are as follows:

- Destruction of habitat
- Over-exploitation
- Indiscriminate use of agro-chemicals
- Oil spills
- Encroachment into the natural forests
- Change in land use pattern and land use conflict

Besides, the situation of faunal diversity is worse due the following reasons:

- Indiscriminate hunting
- Poaching of animals
- Habitat destruction
- Lack of People's awareness
- Poor management of protected areas
- Lack of a plan for compatible forest and wildlife management
- Inefficient implementation of law for wildlife conservation
- Natural calamities like flooding, storm surge etc.

CO-MANAGEMENT

Collaborative management is "A situation in which two or more social actors negotiate, define and guarantee amongst themselves a fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources." (Borrini-Feyerbund, IUCN: 2000). Forestry Sector in Bangladesh yet to experience a scientifically based collaborative management situation to conserve biological diversity as well as socio-economic development of the nearby populace surrounding the protected areas. The co-management 'actors' in Bangladesh are:

- FD –as legal custodian of PAs and
- The local and national stakeholders

The co-management approach has been a fundamental recommendation of the past two World Parks Congresses, and is actively advocated by the IUCN.

Nishorgo Initiatives

In response to people's need for visiting natural beauty and conserve unique biodiversity, Forest Department launched a newer dimension of PAs Management Program, NISHORGO.

- It is a comprehensive effort to improve the management of country's PAs like National Parks, Wildlife Sanctuaries, Game Reserve, Safari Parks, Eco-Parks and other eco-destinations.
- Nishorgo is a GOB Program with financial support for Protected Areas Management from USAID and the Asian Development Bank.

Nishorgo is heading towards

- Stopping the steady loss of bio-diversity of our remaining PAs
- Build the capacity and partnerships necessary to make it happen.
- Designed to activate and formalize participation of local communities dependent on forest resources.
- Increase the number of PA sites and the capacity to receive visitors
- Formalize of a Protected Area management system;
- Improve hydrological and other services from forests;
- Improvement in income and livelihoods of people living in and around the PAs;
- Job creation and enterprise development associated with PAs and nature;
- A more active and vibrant partnership for nature conservation between citizens and the Forest Department

Nishorgo Support Program has started its endeavour with the Nishorgo Support Project (NSP); Initially the project has taken 5 Protected Areas as pilot sites; these are:

- 1.Lawachara National Park
- 2.Remakalenga Wildlife Sanctuary
- 3.Satchari Reserve Forest
- 4.Chunati Wildlife Sanctuary and
- 5.Teknaf Game Reserve

The Co-Management Model

The co-management model, at this stage of initiation, has adopted some salient features. These are:

•Establishing common concerns on: efficiency, equity, sustainability & preservation of biodiversity

Community Participation – Taking a Proactive Role

- Active voluntary involvement in management decision-making, self-determined change
- A process to achieve the set of objectives of: sustainable management, development and biodiversity conservation through facilitation & within the socio-cultural framework
- Sensitization to increase receptivity & response to attain above objectives
- Team building or group formation
- Responsibility & accountability

- Considering Landscape as a whole as a management unit rather than the PA itself
Landscape Concept: Choosing an Appropriate Spatial Scale
 - Often PA boundaries do not include either the ecosystem or the human systems to be managed
 - Land use change outside the PA can threaten its integrity
 - Both wildlife and people may migrate
 - Important economic trade patterns often link outside
 - Natural forests and biodiversity may be reduced to “patches”
 - The “landscape” approach allows for choice of a wider spatial area for, at least, management planning
 - All participatory principles still apply, though the number of stakeholders expands with scale

- Sharing equitably & judiciously responsibilities among the stakeholders
Sharing Responsibilities
 - A participatory approach will be followed in sharing responsibilities.
 - Concerns of all stakeholders should be addressed as judiciously as possible.
 - Responsibilities should be distributed among the stakeholders on the basis of their capabilities.

- Monitoring the functioning of the system
Monitoring the Model
 - Inherent mechanism for continuous monitoring of the system and necessary modifications during the implementation of the Model.
 - Monitoring and evaluation of the Pilot Model at the end of the Project and necessary modification of the model for further refinement .
 - Replication of the refined model for other PAs of the country.

Conclusion

Declaring protected areas for conserving biodiversity under the provision of law did not work effectively in Bangladesh situation. It couldn't stop the steady loss of bio-diversities in protected areas as people consider such effort as denying of their claim to protected areas which they enjoyed for generations. Without active involvement of local people there is a little chance for success of these initiatives. But In Bangladesh context it is very difficult to involve people in such efforts as they require financial benefit either in kind or cash for their involvement. So without considering financial viability, designing and implementing co-management model for protected areas with external assistance have a little chance of success.