
Protected Area Management for the Sundarbans of Bangladesh: Loopholes Still Persist

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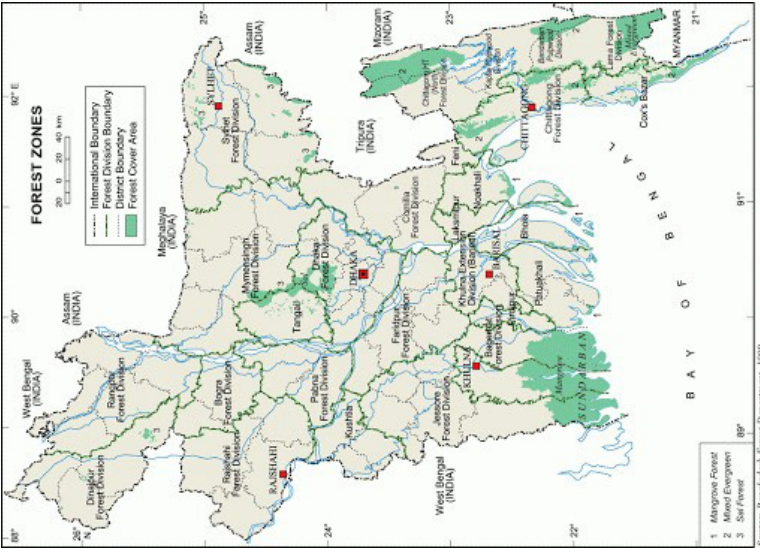
1. Introduction

1.1 Background and History

The Sundarbans Reserve Forest (SRF) is regarded as the largest single-tract mangrove ecosystem in the world (Iftekhar & Islam, 2004, p. 140). The forest with around 10,000 sq. km area is located in the delta of *The Ganges, Brahmaputra* and *Meghna* rivers on the Bay of Bengal between Bangladesh and India as presented in Figure 1. The majority of the forest area (i.e. around 62%), however, belongs to Bangladesh representing around 4.1% of the total landmass of the country (Siddiqi, 2001; Hussain & Acharya, 1994; Abdullah et al., 2016, pp. 15-16). The forest has been protecting the mainland of the country from sea-borne natural hazards (e.g. cyclone and associated tidal surge) for a long time (Islam, 2014, p. 8). The forest, moreover, with its abundant resources plays a significant role for the local, regional and national economy of Bangladesh as well as for biodiversity conservation. Recognizing the global biological significance of the forest, UNESCO declared it a 'World Heritage Site' (UNDP Bangladesh, 2014, p. 8) in 1997.

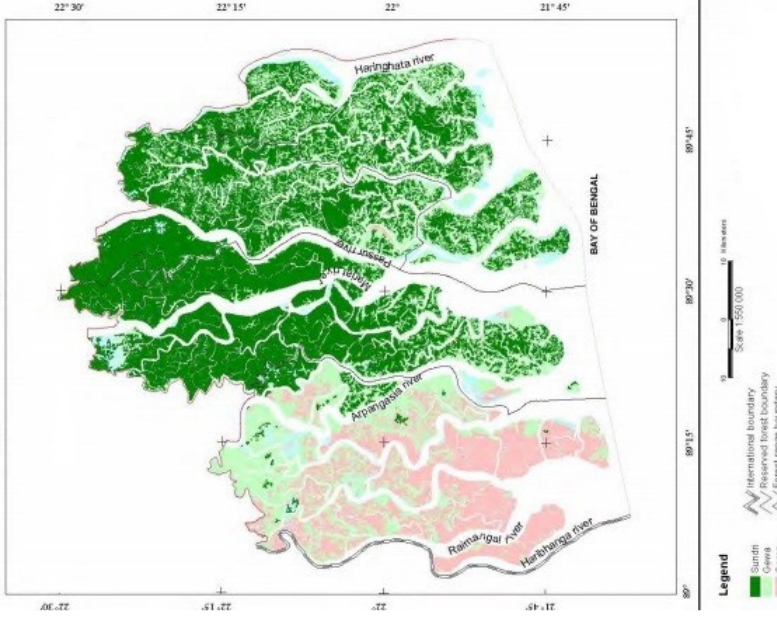
Looking back, the Sundarbans were the property of the local king or *Zamindar* (land lord) in the 16th century who imposed a levy on the extraction of woods from the forest. During the British period (1757-1947), the forest experienced progressive conversion into agricultural land that continued up to 1875. The forests were leased out to settlers that led to the conversion of large tracts of the forests into farm-lands and human settlement areas during early British rule. At that time the Sundarbans were twice their current size. Leasing out forest land, however, was stopped in 1875 following the conservation recommendations made by several prominent British foresters who visited the Sundarbans between 1863 and 1874. Subsequently, a set of guidelines initiating the first conservation activities came into force, and thus, the remaining forest was declared a natural reserve under the Forest Act of 1876. In 1879 a Forest Management Division was established at Khulna District that was in charge of exporting timber as well as overall management of the forest resources. The conservation efforts were in-

Figure 1: Location of the Sundarbans



Map Source: Bangladesh Forest Department, 1999 (slightly modified version) sourced from the internet (accessed 23rd Nov.2016).

Figure 3: Spatial distribution of the plants of the Sundarbans



Map Source: Forest Department of Bangladesh, 2010, p. 34 (slightly version)

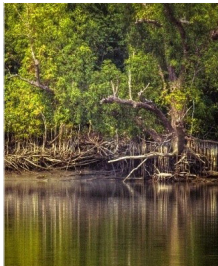
vigorated in 1977, after the liberation of Bangladesh, when the government set aside 139,700 hectares of the forest for three wildlife sanctuaries under the Wildlife Act of 1973 (n. d., 2009; Forest Department of Bangladesh, 2010, p. 49-50; Islam, 2011, p. 32).

1.2 Flora and Fauna

The Sundarbans accommodate around 49 species of mammals, 59 species of reptiles, 8 species of amphibians, 400 species of fishes and 315 species of birds. The forest is a well-known habitat for the Royal Bengal Tiger (*Panthera tigris*), with one of the world's largest surviving populations estimated between 350 and 500 individuals. Moreover, around 20 globally threatened species inhabit the Sundarbans (UNDP Bangladesh, 2014, p. 10).

The forest has a considerably high floral diversity, too. A total of 245 genera and 334 plant species are recorded in the forest (Islam, 2011, p. 32). The dominant plant in the Sundarbans is called Sundari (*Heritiera fomes*) that occupies around 73% of the forest area. Other prominent plant species are Gewa (*Excoecaria agallocha*), Bayen (*Avicennia alba*, *A. officinalis*), Passur (*Xylocarpus mekongensis*), Keora (*Sonneretia apetala*), Goran (*Gerriops decandra*), and Hental (*Phoenix peludosa*) (UNDP Bangladesh, 2014, p. 12). About 99% of the forest area is accounted for by just 9 plant types (Forest Department of Bangladesh, 2010, p. 35). Several

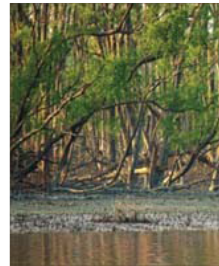
Figure 2: Several examples of the floras and faunas of the Sundarbans



Vegetation of the Sundarbans



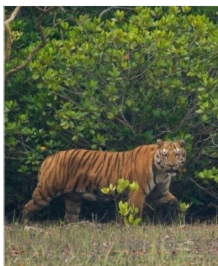
Sundori Plant (*Heritiera fomes*)



Goran Plant (*Gerriops decandra*)



Golpata Plant (*Nypa fruticans*)



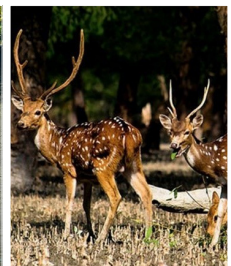
The Royal Bengal Tiger (*Panthera tigris*)



Birds of the Sundarbans



Crocodile of the Sundarbans (*Crocodylus porosus*)



Cheetal Deers of the Sundarbans (*Axis Axis*)

Sources of the images: Internet (accessed 18th Jan. 2017)

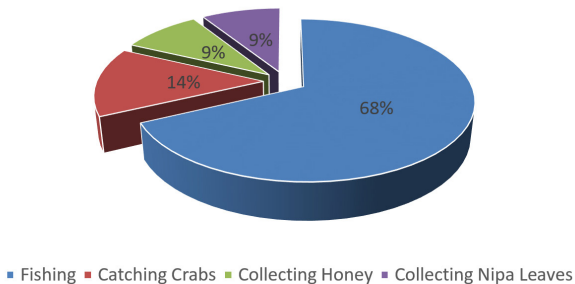
images showing the prominent floras and faunas of the Sundarbans are given in Figure 2, and the spatial distribution of the dominant plant types in Figure 3.

2. Livelihood Situation

Most of the people living in the Sundarbans buffer zone are dependent on the forest resources for their livelihoods (Islam, 2011, p. 1). There are totally 47 Unions (local government administrative areas) under five districts (i.e. *Barguna*, *Pirajpur*, *Bagherhat*, *Khulna* and *Satkhira* districts) comprising the buffer zone of the Sundarbans Reserve Forests. The unemployment rate in those unions is quite high (20-90%) due to the dearth of formal income opportunities (Forest Department of Bangladesh, 2010, p. 45). Moreover, areas surrounding the Sundarbans have particularly high levels of poverty. A study by Abdullah et al. (2016, pp. 20-22) finds that around 42% of the households in the surrounding areas live below the poverty line. Those poor and lower income people surrounding the Sundarbans use the mangrove ecosystem as their principal source of cash income. For instance, around 74% of the annual income for lower income group people comes from the forest resources. Apart from that, also middle and higher income people depend on the forest resources for their livelihood. The reliance of lower income households on forest resources, however, is three times more than for higher income households and twice as much as for middle income households. According to several other studies, around 6.5 million people from the surrounding communities depend on the Sundarbans ecosystem for their livelihoods (IUCN, 2016).

There are, however, five main mangrove resources collected from the Sundarbans – fish, crabs, honey, nipa leaves (*golpata*) and timber (Abdullah et al., 2016, p. 16). Fishing is the most dominant occupation among people living in the vicinity (Getzner & Islam, 2013, p. 78; Islam, 2011, p. 47). The study by Islam (2011, p. 47) reveals that more than half of the households depending on the forest resources live on fishing as illustrated in Figure 4 below¹. To be mentioned, collecting tim-

Figure 4: Distribution of livelihoods based on the extraction of forest resources in the surrounding communities



Source: Author's Construct based on Islam (2011, p. 47)

¹ The study was conducted in several selected communities (villages) that represent the overall economy of the communities surrounding the SRF

bers from the forest has been prohibited since 1989 (Ahmad, 2013, p. 13).

The aforementioned resources, moreover, create secondary income opportunities for people engaged in local value chain businesses with the forest resources. In most cases, middle and higher income group people from the communities are involved in such businesses; the study by Abdullah et al. (2016, p. 20) reveals that related value chain businesses contribute 12% of the total income of higher income households and 22% of the total income of middle income households. Under such businesses, they purchase the respective resources (e.g. raw honey, shrimps, fishes, crabs, etc.) at a low price from subsistent extractors at the local market, and, after a minor processing, resell them at a higher price in the urban markets (Islam, 2010, p. 88).

3. Governance of the Protected Area (PA)

Forest management was introduced in 1875 (n. d., 2009; Forest Department of Bangladesh, 2010, pp. 49-50; Islam, 2011, p. 32; Islam, 2014, p. 6), which means that the forest has been under systematic management for ca. 140 years.

Rigorous management of the forest in line with bio-diversity conservation, however, started in 1879 when a Forest Management Division was established at Khulna District with a view to managing the export of timber as well as all the forest resources. During the Pakistan period (1947-71) in Bangladesh, forest policy favoured the huge extraction of resources denying the rights of people living in the surrounding areas. After the liberation of Bangladesh in 1971, conservation endeavours were initiated in 1977 following the government's attempt to set aside 139,700 hectares of the forest for three wildlife sanctuaries (n. d., 2009; Forest Department of Bangladesh, 2010, pp. 49-50; Islam, 2011, p. 32). The first National Forest Policy undertaken in 1979, however, failed to address issues such as sustainability, community participation and livelihoods (Roy & Alam, 2012, p. 550).

Since the liberation of Bangladesh, the Forest Department (FD) under the Ministry of Environment and Forests of Bangladesh has been playing a central role in the overall management of the forest resources. Also, other government agencies and bodies are involved in managing the forest based on their subject areas and jurisdictions. For instance, the Department of Fisheries is playing a key role in managing the fishery resources of the Sundarbans.

In the past, these agencies mostly tried to manage the forest by imposing restrictions/prohibitions on the extraction of resources. However, pilferage continued due to the reliance of local communities on these resources for survival and due to lack of local control. In order to reduce pilferage, the revised Forest Policy 1994 introduced participatory based management of the SRF. As a result, several NGOs and local groups have been engaged in forest management activities (Iftekhar & Islam, 2004, p. 143; Roy & Alam, 2012, p. 550) since then. The community-oriented management, however, had not been enforced effectively by the Forest Department before the introduction of the Integrated Resources Ma-

agement Plan (IRMP, 2010-2020) in 2010 (Roy & Alam, 2012, p. 553).

The IRMP initiated the 'co-management approach' for managing the resources of the Sundarbans. An important objective of the approach is the equitable sharing of benefits and responsibilities among the stakeholders for the protection and management of the Sundarbans. Furthermore, a local 'Co-management Committee (CMC)' is formed for a certain jurisdiction area. The committee, for instance, can be formed by 29 members coming from different groups of stakeholders (government and non-government agencies) including one or two representatives from the local community (Forest Department of Bangladesh, 2010, p. xi).

4. Conflicts and Conflict Management

Before closer examination of the conflicts in current PA Management of the Sundarbans, it is imperative to take a look at the stakeholders. Name and description of the stakeholders along with their type and level of stake are described in Table 1 below.

According to the IRMP 2010-20, the management of the forests is the responsibility of different stakeholders, however, the Forest Department is still in the leading position by making the CMCs accountable to the department alone. The CMCs are mainly managed through a top-down approach rather than supporting bottom-up planning. The so-called local community representatives of the CMCs are selected on the basis of their political affiliation and/or influence. In most cases, these local representatives come from medium- to high-income groups within the community who rarely represent the subsistence villagers.

Obviously, there are some inter-stakeholder conflicts. The most crucial conflict, however, exists between the local people and the Forest Department. Most of the local people living within the buffer zone of the forest are extremely poor seeking means to survive. They view the forest as a "Gift from God" which provides them with the resources to survive. A study by Abdullah et al. (2016, p. 21) finds that the income from forest resources maintains 22% of the population in the surrounding areas above the poverty line, which means that the forest resources have a great potential to allow local people to survive. In transposition, a large part of the population, living in the buffer areas and holding the same views towards the forest, causes extraction of the resources from the forest in an unsustainable manner (Rahman, 2007, p. 4).

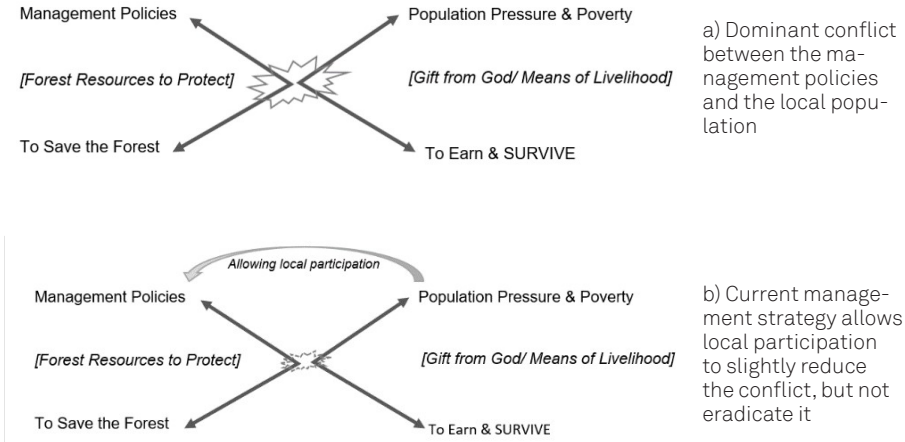
Management policies are formulated to prevent such extraction and protect the forest. These two viewpoints are in conflict with each other as illustrated in Figure 5. Even after introducing the IRMP, this conflict still persists in the SRF buffer areas, because the forest management is not yet working with a community inclusive approach. Placing one or two local community representatives into an 'elite' committee cannot really influence the whole local population, especially against the background of the local majority depending directly on the forest resources for their day-to-day survival. For instance, the harvest of non-timber

Table 1: Stakeholders of the Sundarbans Reserve Forest (SRF)

Stakeholder Name	Description of the Stakeholders	Type of Stake	Level of Stake
A. Primary Stakeholders			
Shrimp PL (Post-Larva) Collector	Poor people: Male, female, children	PL of Shrimps	Major
Crab Collector	Poor people: Male, female, children	Crabs	Major
Fishermen	Poor people: Male, Female, children	Fishes	Major
Fish Culturist	Rich and influential people	Fish culture in closed canals	Moderate
Honey Collector	Poor people: Male, Female, children	Honey and wax from the forest	Major
Nipa Leaves Collector	Poor people: Male, female, children	Nipa leaves	Major
(Illegal) Timber Collector (mostly occasional)	Poor people: Male, female, children	Timber	Moderate
B. Secondary Stakeholders			
Local Money Lenders	Local people, influential persons	Small funding, purchase product	Moderate
Local Secondary Businessmen	Local medium- to high-income people, influential persons	Secondary business with the resources extracted from the forest	Moderate-Major
C. Other/Institutional			
Department of Environment & Forest	Govt. body	In charge of resource management	Major
Forest Department (FD)	Govt. Body	Biodiversity conservation, livelihood, overall forest management	Major
Department of Fisheries	Govt. body	In charge of fisheries management	Moderate
Upazila Administration	Govt. body	Management of <i>Khas Jalmohal</i> (govt. property) and leasing	Moderate
Union Parishad (Local govt. body)	Local Govt.	Management of <i>Khas Jalmohal</i> (small size) and leasing	Moderate
NGOs	Non-governmental agencies	Bio-diversity conservation, rights and livelihoods of local communities	Moderate

Source: Author's Construct based on Forest Department of Bangladesh (2010, p. 45)

Figure 5: Conflicting viewpoints towards the forest resources and the current conflict management



Source: Author's Construct based on Islam (2011, p. 47)

forest products (NTFP) from the SRF is heavily restricted by government regulations; local people, however, still break the rules in order to meet their livelihood needs (Zohora, 2011, p. 114; Abdullah et al., 2016, p. 16).

Allowing one or two local community representatives into the CMC can reduce the extent of conflicts to a minor extent, but cannot eradicate the conflict completely as illustrated in Figure 5 (b). Based on the experiences, a broader engagement of the local communities in the management might bring about better results as this approach offers them a sense of ownership towards these resources. Community Based Forest Management (CBFM) could be an effective alternative solution in this regard that has not yet been taken into serious consideration in Bangladesh. Under this approach, the community takes care of protecting the forest on their own with the necessary support from government and non-government agencies. Such an approach could effectively enhance the livelihoods of the local population and the resource management (Roy & Alam, 2012, p. 553).

In Nepal, for example, after about two decades of failed attempts in managing forests through bureaucratic machinery alone, the government realised the inevitability of engaging local people in the forest management in order to control the rapid loss of forest resources occurring across the vast inaccessible areas. The fact that the approach worked with exemplary success in Nepal (Gautam et al., 2004, p. 143) argues in favour of considering a similar approach in our country with the mentioned similar trends of demographic, economic and socio-cultural dimensions like in Nepal.

5. Conclusion

The Sundarbans with its rich natural-biological resources are important both

from bio-diversity and economic perspectives; in addition, the forest plays a key role in protecting the mainland of the country from sea-borne disasters. Considering all the perspectives, it is imperative to protect the forest from over-exploitation on the one hand, and from political conflicts, on the other hand. In the ideal market situation, all the people living in the buffer zone of the forest have adequate income options other than depending on the forest only, while the management policies are highly supportive to such balanced market conditions. Deviations from the mentioned ideal market conditions should not be based on interests of government agencies, but on local people's needs. A management endeavor cannot be successful unless it is shared on an equal basis with the local poor people who harness the resources from the forest for pure survival purposes.

From another perspective, the policy dimension always combines economic and social structures that need, in addition, necessary dynamic adjustments for achieving sustainability (Roy & Alam, 2012, p. 555). Community based forest management in line with Ostrom's design principles (1990) for managing common pool resources could be the most appropriate strategy for sustainable management of the Sundarbans addressing both bio-diversity conservation and local people's needs for survival.

6 Recommendations and outlook

The 1994 Forest Policy of Bangladesh clearly states in Paragraph 12, "Denuded and encroached Government forest lands will be identified and brought under afforestation program with people's participation on benefit sharing approach..." The policy suggests community-oriented management and community involvement in different forest management projects that has not yet been practically implemented by the Forest Department (Roy & Alam, 2012, p. 552-553). Therefore, the conflicts between the government agencies and the local communities still persist. The following issues should be considered to avoid such conflicts:

- Implementation of the 'benefit sharing' approach in the resource management
- Giving minimal property rights to the local population
- Giving local people the decision-making power
- Appoint at least one person from each occupational group (e.g. fishermen's group, crab collection group, nipa leaves collection group, honey collection group etc.) to the CMCs
- Rather than keeping CMCs one directional, they should be held accountable to both parties, i.e. Forest Department and the local people at the same time

In the long run, moreover, income diversification for the local communities should be considered a priority. As stated by one local villager during a personal communication, "Nobody wants to destroy a beautiful natural resource unless he/she is forced to do so for the survival of the family." A community with a growing population and dominance of poverty would not be complying with the forest conservation efforts unless they are provided with alternative livelihood options. In this re-

gard, the government Department of Rural Cooperatives, Employment Bank and related non-governmental organizations should be promoted in the buffer areas with a view to patronizing alternative earning options, such as livestock farming, small-scaled shrimp culturing, diversified and salt-water resistant crop farming, etc. Such non-forest based income options have a much higher potential to reduce local peoples' poverty and thus, invigorate the efforts for the conservation of forest resources.

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