

# Information Sheet on Ramsar Wetlands (RIS)

*Categories approved by Recommendations 4.7 of the conference of the contracting parties*

**1. Date this sheet was completed/updated:** July 15, 2001

**2. Country:** Bangladesh

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| Designation date |    |    |

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|                       |  |  |  |  |  |
| Site Reference Number |  |  |  |  |  |

**3. Name of Wetland:** Sundarbans Reserved Forest

**4. Geographical coordinates:** 21°27' 30" and 22°30'00" North, 89°02'00" and 90°00'00" East

**5. Elevation:** (average and/or max. & min.)  
0.9 to 2.11 m above mean sea level

**6. Area:** (in hectares) 601,700

**7. Overview:** (general summary, in two or three sentences, of the wetlands principal characteristics)

Sundarbans Reserved Forest is located in the great wetland created at the confluence of the Ganges, Brahmaputra and Meghna river. It is considered as one of the largest contiguous mangrove forest of the world, which is under scientific management for a long time. The Sundarbans is extremely rich in flora and fauna and many of them are economically important. It is the home of a number of unique species of plants like Sundri, Gewa, Passur, Dhundhul, animals like Bengal tiger, Estuarine crocodile, Masked Fin Foot and rare species of shark (*Glephys gangeticus*).

**8. Wetland Type** (please circle the applicable codes for wetlands types; in the present document, the "Ramsar Classification System for Wetland Type" is found page 9)

marine coastal: A B C D E F G H **I** J K Zk(a)

|           |   |    |    |   |    |    |    |    |       |
|-----------|---|----|----|---|----|----|----|----|-------|
| inland: L | M | N  | O  | P | Q  | R  | Sp | Ss | Tp    |
| Ts        | U | Va | Vt | W | Xf | Xp | Y  | Zg | Zk(b) |

human made: 1 2 3 4 5 6 7 8 9 Zk(c)

Please now rank these wetland types by listing them from the most to the least dominant: Intertidal forested wetland includes mangrove swamp, nipa swamps and tidal fresh water swamp forests.

**9. Ramsar Criteria:** (please circle the applicable criteria, the Criteria for identifying Wetlands of International Importance are reprinted beginning on page 11 of this document.)

1    **2**    3    **4**    5    6    7    8

Please specify the most significant criterion applicable to the site: Criteria based on species and ecological communities.

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**10. Map of Site included? Please tick yes  - or – no  : APPENDIX I**

( Please refer to the *Explanatory Note and Guidelines* document for information regarding desirable map traits).

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**11. Name and address of the compiler of this form:**

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Please provide additional information on each of the following categories by attaching extra pages (please limit extra pages to no more than 10):

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**12. Justification of the criteria selected under point 9, on previous page.** (Please refers to the *Criteria for Identifying Wetlands of International Importance* appended to this document):

**Criterion 2:** The Sundarbans mangrove forests supports critically endangered, vulnerable and endemic species. Many floral and faunal species are globally and nationally endangered or critically endangered due to the ecological imbalance. Among the fauna, endangered Royal Bengal Tiger (*Panthera tigris tigris*) listed in the IUCN Red Book, vulnerable Pallas Fishing Eagle (*Haliaeetus leucoryphus*), vulnerable Masked Finfoot (*Heliopais personata*), and critically endangered River Terrapin (*Batagur baska*) are all listed in the IUCN Red Book.

**Criterion 3:** The Sundarbans mangrove forests is a hotspot of biological diversity and support a unique ecological community, which includes a number of terrestrial, aquatic, amphibian and avifauna population including a rich and diverse plant community.

**Criterion 4:** The Sundarbans is located in a transitional zone between freshwater supplied by rivers and canals and saline water from tidal creeks and open sea. As a result, fish required both freshwater and saline water dependent on the aquatic habitat of Sundarban for spawning of eggs and feeding at the juvenile stage. Many fish species such as *Penaeus monodon*, *Macrobrachium rosenbergii*, *Lates calcarif*, *Metapeneaus monoceros* and *Pangaisus pangaisus* spent their part of life cycle in the Sundarbans mangrove forests.

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**13. General Location:** (include the nearest large town and its administrative region):

The Sundarban is situated at the southern part of Khulna, Bagerhat and Satkhira district of Khulna civil Division. The forest is bounded in the north by the private settlement, in the south by the Bay of Bengal, in the east by the Baleshwar River and in the west by the Harinbhanga – Raimongal and Kalindi river which is also the international boundary with India and to the north. There is a sharp interface with intensively cultivated agricultural land of the north with the Sundarbans mangrove forest of the south, which is intersected by a network of tidal rivers, canals and creeks. The Khulna, Bagerhat and Satkhira district towns are located at a distance of 35 km, 23 km, and 70 km north respectively in straight line from the edge of the forest. The Sundarbans wetland is located at a compass bearing of 180°00'00", 195°00'00", and 156°30'00" from Khulna, Bagerhat and Satkhira district headquarters respectively.

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**14. Physical features:** (e.g. geology, geomorphology; origins-natural or artificial; hydrology; soil type; water quality; water depth; water permanence; fluctuation in water level; tidal variation; catchment area; downstream area; climate)

- **Geology and geomorphology:** The Sundarban is situated in the southwest portion of the Ganges, Brahmaputra and Meghna river deltas. The surface geology consists entirely of quaternary sediments, sands and silt with marine salt and clay. The Sundarbans forest is thriving on a tidal flood plain with numerous tidal rivers, canals and creeks. Topographic variations within this low-lying physiography of the area compared to upland areas are negligible. The Sundarban forest is 0.9 m to 2.11 m above mean sea level. The entire forest is inundated twice a day with the high tide.

- **Origins** (natural or artificial): The Sundarbans mangrove forest came into existence through a natural process with the creation of deltas from the sediments carried by the great river Ganges, Brahmaputra, and Meghna. The Sundarbans expanded towards south with the progressive formation of deltas. It is known from the records that the Sundarbans was double of the present size at the beginning of the 17<sup>th</sup> century. The exact life of Sundarbans is not known.

- **Hydrology** (including seasonal water balance, inflow and outflow): The Sundarbans mangrove wetland receives water from the tributaries of three great rivers: the Ganges, Meghna and Brahmaputra. The important rivers that pass through the Sundarbans are Baleswar, Passur, Shippa, Kobadak, Kholpetua and Kalindi. These river systems created four estuaries in the Sundarbans, which are known as Bangra, Kunga, Malancha and Raimangal. Large tidal rivers together with innumerable small channels and creeks all flowing to the Bay of Bengal dissect the whole area. The Sundarbans in fact located in the inter-tidal zone where fresh water carried by the river system mixes with the saline water pushed from the Bay of Bengal with the current of high tide. Again there is a seasonal variation about the level of salinity and fresh water supply due to the increased discharge of fresh water from the river system in the rainy season and reduced supply of fresh water in the dry season.

- **Soil type and chemistry:** The soil is a recent formation of alluvium washed down from the Himalayas mountain range. Soils of the Sundarban Reserved Forest are derived from a mixture of deltaic flood plain deposits and tidal marine deposits. The surface soil is a silty clay loam overlying alternating layer decreases from east to west and from north to south. In the north and east portions of Sundarbans, the soils are slightly saline but salinity increases in the southern & western part of the Sundarban. The soil is rich in sulfur and nitrogen, which is needed for the mangroves. The Sundarban soil is less alkaline in nature. The pH varies from 7.0 to 8.0 throughout the Sundarban.

- **Water quality** (physico-chemical characteristics): The water salinity of the Sundarbans estuary varies seasonally. During monsoon, salinity decreases for heavy downpour in the upstream and its flow influences to a greater extent to the intrusion of sea water. In contrary, salinity increases in summer months. The forest area is divided in three distinct zones considering the salinity of estuary. (a) **Fresh water zone:** It is located on the eastern part of the Sundarbans. Here the forest is relatively rich and dominated by Sundri (*Heritiera fomes*), Gewa (*Excoecaria agallocha*), Passur (*Xylocarpus mekongensis*), Kankra (*Bruguiera gymnorhiza*), Keora (*Sonneratia apetala*), and Goalpata (*Nipa fruticans*). This area remains under fresh water from 7 to 9 months and little salinity (0 to 10 ppt) in the dry part of the year. This area also possesses major fish-stock. (b) **Moderate Saline water zone:** It covers almost the central and southern part of the Sundarbans having salinity varying from 10 to 20 ppt. The important species of this zone are Gewa (*Excoecaria agallocha*), Passur (*Xylocarpus mekongensis*), Dhundul (*Xylocarpus granatum*), Sundri (*Heritiera fomes*), Jhana (*Rhizophora mucronata*) and Keora. (c) **Extreme Saline water**

**zone:** This zone is located in the western and south western part of Sundarbans where the forest is of low height having much less diversity and growth in comparison to the eastern fresh water zone. Here the salinity of the zone is more than 20 ppt and persists round the year with a small change in the rainy season.

- **Depth, fluctuations and permanence of water:** The major river systems are quite deep as compared to the smaller tidal rivers. It is known from the record of the Mongla Port Authority that the average depth of the river Passur is 15 m. The rivers and canals of northern and southern part is less deep than the central part of Sundarbans. The duration of ebb tide in a tidal river is longer than of the flood tide. Flows in the smaller cross channels obviously depend on the timing and magnitude of high water in the channels they connect. In some cases, the difference in timing may cause a net flow of water from one estuary to another, which may vary in direction depending on the prevailing hydraulic conditions. The depth of swatch of no ground (submarine canyon) located in the extreme southern point close to the Sundarbans is 183 m.

- **Tidal variations:** Tides in the Bay of Bengal are predominantly semi-diurnal with a tidal period of about 12 hours 25 minutes. It takes approximately 2.5 hours for the tide to traverse the Raimangal, Jamuna, Malancha, Passur, Sipsa and Baleswar. From these main rivers, the tidal waves spread into the smaller tidal channels. The tidal variation is about 3 m on an average between low tide and high tide.

- **Catchment area:** The upper catchment area of the Sundarbans is shared by four countries viz. India, Nepal, Bhutan and China with the largest and highest mountain range of the world. The middle catchment is formed by the floodplains of the three big rivers, the Ganges, Brahmaputra and Meghna and the proximate catchment consists of the have the Ganges-Gori drainage system located to the east of the Hoogly and west of Meghna river. Vast quantities of sediment are carried downstream from the upper catchment and deposited in Bangladesh. The transported sediments are the base material, which formed the Sundarbans deltas and continued to accumulate there carried further to the Bay of Bengal.

- **Downstream area** (especially in the case of wetlands that are important in flood control): The Bay of Bengal is located in the downstream of the Sundarbans where the swatch of no ground is located. The off shore of the Sundarbans is very important to the fishermen for fishing in the winter season as well as Hilsa (*Tenuialosa ilisha*) fishing in the rainy season. This area is important as there are scope of deposition of Nitrogen and Phosphorus in the swatch of no ground, which causes the phyto-plankton blooming due to the upwelling. This phenomenon is very important for high catch of winter fishery in off shore areas of Sundarbans.

- **Climate:** The Sundarbans is located south of the tropic of cancer and at the northern limits of the Bay of Bengal, which may be classified as tropical moist forest. Annual average rainfall varies from 1600-2000 mm. The relative humidity is 80 percent. Temperature ranges from 7.7<sup>0</sup> C (January, 1999) to 38.8<sup>0</sup> C (April, 1972) round the year.

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**15. Hydrological values:** (groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.)

The Sundarbans ecosystem is totally dependent on hydrological regimes and their particular characteristics. Fresh water supply is very important for the productivity of the Sundarbans, which include the plant growth as well as fish production. The Sundarbans play a very important role to prevent the tidal surge generated from the cyclonic depression in the Bay of Bengal. It is known that the coastline from the center of the Sundarbans toward east has remained virtually unchanged over the last 200 years.

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**16. Ecological features:** (main habitats and vegetation type)

The abundance of Sundri (*Heritiera fomes*), Gewa (*Excoecaria agallocha*), Goran (*Ceriops decandra*), and Keora (*Sonneratia apetala*) characterize the Sundarbans mangrove forest. Sundri, Gewa and Goran are the economically important species. Gewa is used as a raw material for newsprint manufacture and match industries. About 99 percent of the forest area is divided into 9 forest types. They are Sundri (*Heritiera fomes*), Sundri (*Heritiera fomes*) – Gewa (*Excoecaria agallocha*), Sundri (*Heritiera fomes*) – Passur (*Xylocarpus meknogenssis*) - Kankra (*Bruguiera gymnorhiza*), Gewa (*Excoecaria agallocha*), Gewa (*Excoecaria agallocha*) - Sundri (*Heritiera fomes*), Gewa (*Excoecaria agallocha*) - Goran (*Ceriops decandra*), Goran (*Ceriops decandra*) - Gewa (*Excoecaria agallocha*), Passur (*Xylocarpus meknogenssis*) - Kankra (*Bruguiera gymnorhiza*) - Baen (*Avicennia officinalis*) and Keora (*Sonneratia apetala*). In line with the biogeographical zoning approach, five habitat types have been identified in the Sundarbans; namely: shore, low mangrove forest, high mangrove forest, openland/ grassland, and estuarine riverine. The shore habitat covers the open sandy to muddy areas along the edges of the Bay of Bengal, which generally serve as the habitat of shore bird in the Sundarbans.

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**17. Noteworthy flora:** (indicating; e.g. which species are unique, rare, endangered, or biogeographically important, etc.)

Sundarbans have a considerably high floral diversity. A total of 245 genera and 334 plant species were recorded in this forest. The more prominent and important tree species found include the Sundri (*Heritiera fomes*), Gewa (*Excoecaria agallocha*), Keora (*Sonneratia apetala*), Goran (*Ceriops decandra*), Singra (*Cynometra ramiflora*), Dhundul (*Xylocarpus granatum*), Amur (*Amoora walichii*), Passur (*Xylocarpus mekongensis*), Kripa (*Lumnitzera racimosa*), Dakur (*Cerbera odollum*) and Kankra (*Bruguiera gymnorhiza*). Golpatta (*Nipa fruticans*) is a very useful palm commonly found in the Sundarbans. It is widely gathered for thatching purposes of the rural dwelling houses. Hantal (*Phoenix palludosa*) is another palm species, which is used extensively in the construction of small huts as roof rafters and frame of walls. Ullu grass (*Sacharum officinalis*) is widely gathered for thatching rural houses though it is the main fodder species of deer. Hogla (*Typha elephantiana*) is gathered and split for cheap fencing and mat making. Nal (*Eriochloea procera*) is used extensively for making mats. Hargoza (*Acanthus illicifolious*), tiger fern and Ora (*Sonneratia caseolaris*) are canal bank protection species that prominently grow along riverbanks. All the plant species found in the Sundarbans are growing naturally and considered as indigenous. There is no knowledge of endemic, exotic and invasive species in Sundarbans. The Sundri (*Heritiera fomes*) is considered threatened due to the occurrence of a disease commonly known as top dying Sundri disease. It is known that some species are becoming rare in the present time. The Bhat Kati (*Bruguiera parviflora*), Kala Baen (*Avicennia marina*) is now a days a rare plant in the Sundarbans. The Sundri is the unique species of the Sundarbans Ramsar Site (Hussain and Acharya 1994, Canonizado and Hossain 1998).

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**18. Noteworthy fauna:** (indicating; e.g. which species are unique, rare, endangered, or biogeographically important, etc.)

It is known that there are 289 terrestrial faunal species of 185 genera and 219 aquatic faunal species of 146 genera in the Sundarbans Forests. Prominent and important mammal species include the Royal Bengal Tiger (*Panthera tigris tigris*), Spotted Deer (*Axis axis*), Barking deer (*Muniticus muntjack*), Macaque Monkey (*Macaca mullata*), Wild Boar (*Sus scrofa*), Jackal (*Canis aureus*), Jungle cats, Indian fishing cats (*Felis viverrina*), small and large civets (*Vivera* sp.), small mongoose (*Herpestes auropunctatur*), common otter (*Lutra percipilciliata*), smooth coated otter (*Lutra lutra*), Bats (*Scotophilus temmincki*), Irrawady squirrel (*Callosciurus pygerythrus*), crestless Malayan porcupine, and Large bandicot rat (*Bandicota indica*). The important reptile

species include the estuarine crocodile (*Crocodylus porosus*), rock python (*Python molurus*), common cobra (*Naja hena*), gekko (*Gekko gekko*), sea snakes, monitor lizards (*Varanus bengalensis*). There are unique aquatic lives like olive ridley turtles (*Lepidochelys olivacea*), dolphins (*Platanista gangetica*) and Shark (*Glephys gangeticus*) in the Sundarbans. Of the bird species, the aquatic ones include the Adjutants (*Leptoptilos javanicus*), Storks, Herons (*Ardea purpurea*), Egrets (*Egretta alba*), and Little cormorant (*Phalacrocorax niger*). The semi-aquatic ones include the Plovers, Red-wattled Lapwing, Avocet, Stint, Curlew, Sandpiper, common Green shank (*Tringa nebularia*), Common Red shank (*Tringa tetanus*), Gulls, and Terns. A good numbers of raptorial birds are also found which include the falcons, eagles, vultures, kites and harriers. The other terrestrial birds are the kingfishers (5 species), doves (*Streptopelia chinensis*), pigeons (*Columba hodgsoni*), flycatchers (*Raipidura albicollis*), oriental magpie robin (*Copsychus saularis*), red jungle fowl (*Gallus gallus*), woodpeckers (*Dinopium bengalensis*), owls and rose-winged parakeet (*Psittacula kraneri*). The Sundarbans and surrounding areas have a rich avifauna population. The most recent list of species indicates that at least 315 species representing 48 percent of the birds of Bangladesh are found in Sundarbans Ramsar site. Of these, 84 species are migratory making the Sundarbans a valuable location for passage of migration. The inshore island of Tinkona and offshore islands of Putney, Nilbaria, Kachikhali and Dubla are important habitat for waders. Some of the amphibians include the rana (*Bafo melanotictus*) and mycrophylla species of frogs are found in Sundarbans. The biogeographically important bird Masked Finfoot (*Heliopais personata*), which is the only species of sub-Himalayan region found in the Sundarbans (Hussain and Achrya 1994), and (Sidensticker and Hai 1998).

It is known that there are 8 species of Chondrichthyan fish, 168 species of Osteichthyan fish and 31 species of crustacean in the water bodies of Sundarbans wetland. It is reported that over 120 species of fish are commonly caught in the Sundarbans mangrove forest. Shellfish and mollusks such as univalves (Gastropods) and bivalves (Polycepod) are generally collected from Sundarbans for lime production. There are at least seven species of bivalves in estuarine areas and the mangrove floor of the Sundarbans. In the past, wild buffalo, 2 species of deer, rhinoceros extinct from Sundarbans and presently 2 species of amphibians, 14 species of reptiles, 25 species of birds and 5 species of mammals are considered as endangered species (Canonizado and Hossain 1998) and (Bernacsek and Haque 2001).

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**19. Social and cultural values:** (e.g. fisheries production, forestry, religious importance, archeological site, etc.)

The Sundarbans mangrove wetland produces huge amount of fish and biomass for the community living in the periphery. A big proportion of people from near and far from the wetland do fishing in and around Sundarbans round the year who are locally known as *Jele*. A large number of people are involved in the forestry operation too from time immemorial. The wood and goalpata (*Nipa fruticans*) leaf harvesting community locally known as *Bawali*, honey harvesting community locally known as *Mouwali* and leaf collecting community locally known as *Mele*.

There is a cultural value of the Sundarbans wetland where the devotees of Hindu community assemble on the 30<sup>th</sup> November every year for a day to have a holy bath in the seawater of Alorkol. About 5000 devotees assemble for the religious rituals. Some unscrupulous people also manage to get the opportunity to enter inside the Sundarbans with the object of killing wildlife and unofficial felling of valuable Sundri (*Heritiera fomes*), Passur (*Xylocarpus meknogensis*) and Dhundhul (*Xylocarpus granatum*) trees. There is a old relict of Hindu temple, which is locally known as Shekher Mandir (Temple of Sheikh) at Shekher Tek under Khulna Range of Sundarbans West Forest Division.

**20. Land tenure ownership of:** (a) site (b) surrounding area

The Sundarbans mangrove forest was declared as a Reserved Forest in the year 1875, which is the property of the Government of Bangladesh. The Bay of Bengal is located at the southern periphery over which the Government of Bangladesh has the right.

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**21. Current land use:** (a) site (b) surrounding/catchment

**(A) Site:** The Sundarbans mangrove wetland as Rmasar site is used in different ways. About one third of the total area is used as protected area for purpose of conservation of biological diversity. Two third of the total area is used as a production zone where timber, goalpata (*Nipa fruticans*), fuelwood (from *Ceriops decandra*), pulpwood (from *Excoecaria agalloca*), leaves, shells, crabs, honey and fish are harvested by the people living around Sundarbans. The fishermen round the year use the internal river system and the offshore water body for fishing and shrimp fry catching. There is a shipping route through the Sundarbans. Besides the forest establishment inside the Sundarbans including two rest houses, there is an office of the Mongla Port Authority and a naval base of the Bangladesh Navy at Nilkamol. There is a temporary establishment of Khulna Newsprint Mill for the extraction of pulpwood in the forest. About 5000 fishermen and support people stay temporarily at Dubla for a period of 4 months for winter fishing. There is a Hindu religious festival at Alorkul area where few thousand devotees assemble to perform the religious rituals.

**(b) Surrounding/catchment:** There are private settlements along the fringes outside the Sundarbans reserved forest. The surrounding lands are being used for traditional agricultural crop production and recently introduced shrimp farming. There is some urbanization in the surrounding areas with the increase of population.

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**22. Factors (past, present or potential) adversely affecting the site's ecological character, including change in land use and development projects:** (a) at the site (b) around the site

**(a) At the site:** The reduction in fresh water flow due to the diversion of water of the river Ganges at Farakka, India along with the construction of dykes, closures and regulators on the rivers and wetlands have tremendously affected the plant and fish population of Sundarbans. As a result it is assumed that the plant community will suffer from growth as well as diversity of species in long run. It is known that there is an occurrence of top dying disease in the economically important species Sundri (*Heritiera fomes*) due to the severe reduction in the fresh water supply and other causes like siltation, nutrient deficiency, fungus invasion. Moreover, the specialist hypothesizes that if the fresh water flow continued to decline during the dry part of the year then the rich Sundarbans forest of east will look like the dwarf scrub forest of the west in future. The pollution generated from the industries and port of Khulna and Mongla is also a problem for the growth and development of flora and fauna of Sundarbans wetland. The siltation is also a problem in the eastern and north eastern part of Sundarbans where a number of rivers and canals have been silted up resulting in the decrease in the coverage of the tide water required for the growth and development of mangrove ecosystem.

**(b) Around the site:** The creations of dykes and drainage sluices have restricted the movement of tide water resulting the siltation of a number of rivers, small canals and wetlands. Recently, there is a trend of construction of rural roads and necessary culverts, which also brought about changes in land terrain and drainage system. The construction of dykes, closures and regulators also reduced the supply of fresh water from the adjacent areas.

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**23. Conservation measures taken:** (national category and legal status of protected areas including any boundary changes which have been under management practices; whether an officially approved management plan exists and whether it has been implemented)

Three protected areas were established along the southern periphery of the Sundarbans mangrove wetland in the year 1996 comprising an area of 1,39,699 hectare out of total area of 6,01,700 hectares for the conservation of flora and fauna. Activities like cutting trees, killing wildlife and catching fish are prohibited within the jurisdiction of the protected areas. The *Ramsar Guidelines for the implementation of wise use concept* (Recommendations 4.10) and *Additional guidelines for the implementation of the wise use concept* (Resolution 5.6) are not available for implementation. A new management plan is under preparation known as Integrated Sundarbans Management Plan under the Sundarbans Biodiversity Conservation Project for the management of the Sundarbans mangrove wetland as a whole. There is a separate plan for the management of the fish resources of the Sundarbans. The Montreaux Record and/or visit under the Ramsar Advisory Mission did not take place for the Sundarbans Ramsar site.

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**24. Conservation measures proposed but not yet implemented:** (e.g., management plans in preparation on; officially proposed area, etc.)

A protected area management plan was prepared in the year 1997 for the management of 3 protected areas, which was approved by the government. The management plan though approved by the government but not yet implemented. Initially protected areas were established in the year 1977 with smaller area in the same place where the present protected areas are located. Three protected areas established in the year 1996 are known as Sundarbans East, Sundarbans South and Sundarbans West sanctuary. The fishing and other activities like harvesting of goalpata (*Nipa fruticans*) leaves and other minor produce continued even after the establishment of the protected areas. These activities were totally stopped from the year 1998.

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**25. Current Scientific research and facilities:** (e.g. details of current projects; existence of field stations, etc.)

The Environment Management Division of Bangladesh Forest Department is responsible for the study of the resources of protected areas. It has 8 field station for study and research. The Mangrove Silviculture Division of Bangladesh Forest Research Institute have two field station in the Sundarbans.

A study is progressing about the breeding of Olive Ridley turtle (*Lapidochelys olivaceae*) in the Sundarbans West Sanctuary by the Environment Management Division, Khulna.

A study is progressing about the breeding of Blue Tailed Bee Eaters (*Merops philippinus*) at Katka by the Environment Management Division, Khulna.

A study on the ecology of tiger habitat and feasibility of camera trapping of tiger as a tool for tiger census in the Sundarbans is under process.

The Environment Management Division is now conducting a study on the breeding biology of estuarine crocodile.

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**26. Current conservation education:**

Recently an information and education center was established at Khulna under the Sundarbans Biodiversity Conservation Project.

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**27. Current recreation and tourism:** ( )

Both foreign and local tourists visit the Sundarbans mangrove wetlands. It is known the around 500 foreign and 40,000 local tourists visit Sundarbans. The tourism in Sundarbans is a seasonal one which occur from the month of October to April. There are two rest houses located at Katak and Kachikhali of Sundarbans East Sanctuary, which provide accommodation facilities. There are watch tower for wildlife sighting at Katka and Nilkamal. An arboretum is in the process of establishment at Karamjal, which will attract the tourist. The tourism in the Sundrbans is a boat based one. There are a number of private water vessels, which provide facilities for tourism in the Sundarbans.

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**28. Jurisdiction:** (territorial e.g. state/region, and functional e.g. Dept. of Agriculture/Dept. of Environment etc.)

(a) *Territorial Jurisdiction:* Ministry of Environment and Forests, Government of Bangladesh

(b) *Functional Jurisdiction:* Department of Forests

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**29. Management authority:** (name and address of the local body directly responsible for managing the wetland)

- (a) Conservator of Forests, Khulna Circle, Bana Bhavan, Mahila College Road, Boyra, Khulna 9000, Bangladesh, Telephone: 088-41-760501, Fax: 088-41-760517, email: [cfkhulna@bttb.net.bd](mailto:cfkhulna@bttb.net.bd)
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  - (c) Divisional Forest Officer, Sundarbans West Forest Division, Khulna 9100, Telephone 088-042-720665, Fax : 088-041-721275.
  - (d) Divisional Forest Officer, Aquatic Resources Division, College Road, Boyra, Khulna 9000, Bangladesh, Telephone: 088-041-762151, email: [aquatics@khulna.bangla.net](mailto:aquatics@khulna.bangla.net)
  - (e) Divisional Forest Officer, Ecotourism and Wildlife Division, College Road, Boyra, Khulna 9000, Bangladesh, Telephone: 088-041-760345
  - (f) Divisional Forest Officer, Sundarbans Environment Management Division, College Road, Boyra, Khulna 9000, Bangladesh. Telephone : 088-041-762941
  - (g) Divisional Forest Officer, Forest management Plan Division, College Road, Boyra, Khulna 9000, Bangladesh. Telephone : 088-041-761180, email : [ahossain44@hotmail.com](mailto:ahossain44@hotmail.com)
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**30. Bibliographical references:** (scientific/technical only)

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