The Sundarbans
(Bangladesh) (N 798)

Progress Report

on the decisions of 43COM.7B.3
of the World Heritage Committee
on the Sundarbans World Heritage Sites

May 2021



Ministry of Environment, Forest and Climate Change
Government of the Peoples' Republic of Bangladesh



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Acronyms and Abbreviation

BFD	:	Bangladesh Forest Department
BTAP	:	Bangladesh Tiger Action Plan
BWDB	:	Bangladesh Water Development Board
CREL	:	Climate Resilient Environment and Livelihood
DCT	:	Dolphin Conservation Team
DoE	:	Department of Environment
ECR	:	Environment Conservation Rules
ECNEC	:	Executive Committee of the National Economic Council
EIA	:	Environmental Impact Assessment
EMP	:	Environmental Management Plan
EPZ	:	Export Processing Zone
FD	:	Forest Department
FGD	:	Flue Gas De-sulphurisation System
FTRT	:	Forest Tiger Response Team
GRRP	:	Gorai River Restoration Project
LPG	:	Liquid Petroleum Gas
MoEFCC	:	Ministry of Environment, Forest and Climate Change
MPA	:	Mongla Port Authority
MSTPP	:	Maitree Super Thermal Power Project
NOSCOP	:	National Oil and Chemical Spill Contingency Plan
NCSS	:	National Committee for Saving the Sundarbans
NTRP	:	National Tiger Recovery Programme
OUV	:	Outstanding Universal Value
PA	:	Protected Area
PPR	:	Public Procurement Rules
SDBC	:	Sustainable Development and Biodiversity Conservation in the Sundarbans
SEALS	:	Sundarbans Environmental and Livelihood Security
SEA	:	Strategic Environmental Assessment
SRF	:	Sundarbans Reserve Forest
SMART	:	Spatial Monitoring and Reporting Tool
SMP-I	:	Management of the Sundarbans Mangrove Forests for Biodiversity Conservation and Increased Adaptation to Climate Change
SIZ	:	Sundarbans Impact Zone

SW	:	South-west Region
TCC	:	Tiger Co-ordination Committee
TCP	:	Tiger Conservation Project
ToR	:	Terms of Reference
VTRT	:	Village Tiger Response Team
WCCU	:	Wildlife Crime Control Unit
WCS	:	Wildlife Conservation Society
WHS	:	World Heritage Site
ZLD	:	Zero Liquid Discharge

Executive Summary

In response to the recommendations, concerns and requests given in the Decisions of 41 COM 7B.25 and 43 COM 7B3 of the World Heritage Committee, the Government of Bangladesh is submitting the progress report documenting the current and future conservation initiatives for management of the Sundarbans ecosystem, potential major restorations activities.

With a land mass of 147,570 sq. km. with very high population of approximately 163 million Bangladesh is one of the most densely populated countries in the world. As an example, the combined land mass of France, Spain and Italy is almost ten times that of Bangladesh whereas the population is approximately the same. Despite of high population density, Bangladesh is progressing forward with a steady economic growth of more than 7.86% due to which, the per capita income has increased to 2227 USD in recent times.

Bangladesh has made rapid social and economic progress in recent decades. Recently Bangladesh has graduated from the LDC and the economic growth trajectory has retained its smooth momentum even amidst the prevailing Covid-19 global pandemic. This steady but sure momentum has slingshot the economic growth within the last few decades grossing a total GDP of 364 billion USD and has resulted in boosting the current Foreign Reserve of Bangladesh to 45 billion USD, and annual Export to 37 billion USD. Some of the landmark successes that have been fueled by the economic growth includes Bangladesh being placed 4th in world in terms of fish production, 2nd in terms of Jute production, 2nd in terms of garments industry, and 4th in terms of rice production. Recent statistics of World Bank marks the increase of agriculture production in the country as the second highest in the world during the last 20 years. This has culminated in an overall development in human index with average life expectancy increasing to 73 years as well as increases in happiness index.

Bangladesh houses the Sundarbans with a total area of 6000 sq km, out of which, 1397 sq km has been marked as world heritage site in 1997 by UNESCO. The Sundarban is a famous biodiversity hotspot, harboring 320 species of birds, 53 reptiles, 49 mammals, and 290 fish, as well as protecting threatened and endangered species like the estuarine crocodile, Indian python, and Bengal Tiger. Notably, it is the only area known to have tigers that are ecologically adapted to mangrove habitats. The total carbon sink capacity of the forest is 136 million tons which is equivalent 499 million ton CO_2.

The Sundarbans have undergone positive changes in the last decades with increase of the mangrove forest over the last four epochs (1976-2015) being from 436,617 ha in 1976 and 494,757 ha in 2015. (Reference: Helena Borgqvist, M Islam & Lalit Kumar, 2018.). Moreover, the Sundarbans experienced almost no tree cover loss from 2001 to 2012. While pollution, overexploitation, aquaculture and agriculture all pose threats to this ecosystem, conservation efforts have largely minimized forest loss in the 21st century. As a result, the Sundarbans have recently been declared as “pirate-free” by our Honorable Prime Minister.

At an exemplary level, Bangladesh is one of the few developing countries that initiated the Strategic Environmental Assessment process to safeguard its environment. The Sundarbans, the world’s largest continuous mangrove forest, is a national asset and pride for Bangladesh and the SEA has targeted the wellbeing of this heritage. EIA approval has been mandatory for all power plant projects with strict monitoring provisions for ensuring compliance to all mitigation measures suggested within the EIA report.

Current and future development plans until 2041 in the Southwest region of Bangladesh revolving around preservation and conservation of the valuable Sundarbans ecosystems include dredging of Gorai River to divert water to the Southwest region, no environmental clearance to any large-scale industrial projects pending completion of SEA, integrated freshwater inflow management plan to maintain freshwater flow and improve water quality, future dredging of the Pashur river, India-Bangladesh JWG on

Conservation of the Sundarbans and SMART-based patrolling across the Sundarbans Reserve Forest (SRF).

The Mongla Port Authority has taken initiative to procure and implement Vessel Traffic Management Information System (VTMIS). Standard Operating Procedures (SOPs) has been placed for Disaster Management for the Port. In addition, further projects have been taken up to dredge numerous other waterways to prohibit resource exploitation.

In recent times, especially in the year 2020 and 2021, the state party has taken various measures for conservation of the natural ecosystem and Outstanding Universal Value (OUV) of the Sundarbans through Bangladesh Forest Department. Such as Expansion of Protected Areas, monitoring using drone (for SMART patrolling and Ecological Monitoring), more functional Co-Management, prohibition of entrance of tourist as well as the resource harvestors during the breeding season of wildlife, extension of eco-tourism in buffer zone area and shifting of eco tourism activities from core zone to buffer zone, compensation rules for the Wildlife Victims, 2021, training for forest resource user for alternative livelihoods activities, conservation of the endangered species like White-rumped vulture, Batagur baska, salt water crocodile and Masked finfoot, implementing several of the projects e.g. Sundarbans Shurokkha (in English- 'Sundarbans Conservation') Project, Development and extension of Eco-tourism in Sundarbans project, Pond excavation and Re-excavation project for the supplying of fresh drinking water in order to sustainable Forest Management of the Sundarbans, Re-establishment of Telecom system in Sundarbans project, Support to the Management of the Sundarbans Reserved Forest (SMP II) project, Mobile Apps based Development and post-development support of Eco-tourism, Strategic Environmental Assessment (SEA) in the south-west region for the conservation of Outstanding Universal Value of the Sundarbans. Government also supporting to implement Bangladesh Tiger Action Plan and National Tiger Recovery Programme, strategy for the Sundarbans under Bangladesh Delta Plan 2100 to monitor and further improve the ecological management of the property as well as the whole mangrove area.

The MoU between the Ministries of Environment, Forest and Climate Change of both Bangladesh and India signed in 2011 reinforced transboundary cooperation on the Sundarbans. The countries have agreed to conduct studies to develop indicators to measure health of the ecosystems of the Sundarbans and to identify impacts of climate change on its ecosystems.

1. Introduction

The Sundarbans, the world's largest continuous mangrove forest, is a national pride for Bangladesh. The Sundarbans Reserve Forests (SRF) has three wildlife sanctuaries that covers 1,39,700 ha which was declared as World Heritage Site in 1997. In June 2017, the State Party has extended the area of this 3 (three) Wildlife Sanctuaries to 3,17,950 ha from 1,39,700 ha to facilitate undisturbed breeding ground for the Royal Bengal Tiger and other wildlife in the Sundarbans and World Heritage Site (WHS). Three dolphin sanctuaries (Dhangmari, Chandpai and Dudhmkhi) measuring an area of 1070 ha have been established in 2012 at eastern portion of the Sundarbans and another three dolphin sanctuaries in and around the Sundarbans (Shibsha. Bhodra and Pankhali) measuring an area of 3427 ha has been established in 2020 for conservation of Ganges River dolphin and Irrawaddy dolphins. Now, the total area of wildlife sanctuary covers about 53.59% area of the Sundarbans. According to the Wildlife (Conservation and Security) Act, 2012, there is no access to the sanctuary area for the resource collectors - living around the vicinity of the Sundarbans and any kind of economic activities are strictly prohibited within the wildlife sanctuaries. These efforts have been protecting the property from possible threats that may affect the Outstanding Universal Value (OUV) of the property.

The local community in the adjacent to the Sundarbans area has been dependent on agro-based economic activities such as aquaculture and hatchery, paddy processing for rice production, betel-nut processing etc. The Mongla Port was established in Southern part of Bangladesh in 1954. Various kinds of secondary and tertiary economic activities emerged in the region after establishment of the Port.

The Government of Bangladesh is committed to deliver its highest effort to take all measures to protect and conserve its integrity as a whole. The decisions adopted during the 43COM 7.B 3 in Baku, Azerbaijan in 2019 and 41st session of the world Heritage committee in Krakow, Poland in 2017, are being complied by the Government of the People's Republic of Bangladesh. The Government is also taking a number of additional measures to maintain and improve the existing diversity and richness of the ecosystem of the property as well as the entire Sundarbans area.

2. Response to the Decision of the World Heritage Committee

Government of Bangladesh has prepared a comprehensive response on the decisions of 43 COM 7.B 3 of the World Heritage Committee. The responses to each decision are as follows:

2.1 Decision no. 1-2

i) *Having examined Document WHC/19/43.COM/7B.Add,*

ii) *Recalling Decision 41 COM 7B.25, adopted at its 41st session (Krakow, 2017).*

Response

A comprehensive response on the decisions of 41 COM 7B.25 and 43rd COM 7B.3 has already been sent to the WHC in December 2018 and January 2020.

2.2 Decision no. 3

Welcomes the formation of an India-Bangladesh Joint Working Group (JWG) of the Sundarbans and requests the State Party of Bangladesh to keep the World Heritage Centre informed of the concrete actions and outcomes that arise from the JWG and how these will strengthen the long-term protection of the property's Outstanding Universal Value (OUV).

Response

To improve the trans-boundary cooperation between Bangladesh and India on conservation of the Sundarbans, the first meeting of India-Bangladesh Joint Working Group (JWG) was held in India on 21 July 2016. Initiatives have already been taken by the Ministry of Environment, Forest and Climate Change (MoEFCC) on agreed action points of the aforesaid meeting. The MoEFCC has constituted a Working Group in Bangladesh side for working on the agreed action points and for arranging second bilateral meeting with India.

To improve the trans-boundary cooperation between Bangladesh and India on conservation of the Sundarbans, the first meeting of India-Bangladesh Joint Working Group (JWG) was held in India on 21 July 2016. The JWG discussed on-

- Sharing of knowledge on flora and fauna in both parts of the Sundarbans through a biodiversity mapping and study.
- Water quality monitoring of important rivers terminating in the Sundarbans region and ultimately to the Bay of Bengal for both the countries through a standard methodology and standard parameters solely for the management of the Sundarbans ecosystems.
- Siltation trend analysis of rivers terminating in the Sundarbans region of both the countries and generation of time-line data for future studies and assessments solely for the management of the Sundarbans ecosystem.
- Sharing of intelligence information on smuggling of animals and wildlife products; inviting forest officials to regularly attend meetings on security issues held by forces; officials of India and Bangladesh holding periodic meetings on either side of the Sundarbans alternately- to share management strategies and create common approaches as envisaged in the MoUs.
- Illegal exploitation of marine biodiversity using harmful gears.
- Measuring the scale of dependency of adjacent community of the Sundarbans ecosystem.
- Study on the Sundarbans dependent community and their alternative livelihoods.
- Joint identification of research need, joint research and incorporation of research findings in the Sundarbans management practices for the whole Sundarbans ecosystem.

The JWG has agreed-

- To conduct a joint study to arrive at a set of indicators in order to measure health of the ecosystems of Sundarbans.
- Undertake a joint study on impact of climate change on the ecosystems of Sundarbans.

Initiatives have already been taken by the Ministry of Environment, Forest and Climate Change (MoEFCC) to determine the modalities of the proposed joint studies. The MoEFCC has constituted a Joint Working Group (JWG) in Bangladesh side for arranging 2nd bilateral meeting with India. The Second meeting was arranged to be held in Bangladesh on 18th February 2020 and the host country sent a proposal to the Indian Government but the Indian Government requested to arrange the meeting another time (providing them enough time for preparation). In the meantime, the committee of Bangladesh side took part in various internal meetings regarding implementation of the Agreed Action Points of the 1st meeting of JWG. Due to COVID-19 situation, the meeting has not been arranged yet. In the meantime, the Government of Bangladesh, meeting with its own stakeholders, took some further steps following the decisions of the 1st JWG meeting. The progress of Bangladesh part is given below:

Sl no	Agenda	Actions taken
01	Sharing of knowledge of flora and fauna in both parts of Sundarbans through biodiversity mapping and evaluation study.	As per decision of meeting of the Bangladesh part 22 research proposals on fauna is under consideration from Bangladesh part for Formulating Common Approach on Biodiversity Mapping of the Sundarbans and these proposals may be discussed in the 2nd meeting of JWG for selection of the best proposals. Besides, the following steps have been taken regarding the fauna and flora of the Sundarbans. **Fauna** Some of the Research/Survey have already been conducted by Bangladesh Forest Department. 1) Under the Bengal Tiger Conservation Activity Project Tiger Census (2018-19) was conducted through capture camera trapping method and estimated 114 tiger population in Sundarbans Bangladesh part. It was 106 in tiger census conducted in 2015 with the same method. 49 VTRTs (Village Tiger Response Team) and 40 Tiger Scouts are working in the field along with FD (Forest Department) staffs and WILDTEAM to aware local people for Tiger conservation and to rescue the stray tiger from villages to its natural habitat. 2) Under "Vulture Conservation Initiative" Vulture survey conducted and recorded 100 White-rumped Vulture in Sundarban Bangladesh part. 3) Under "Population Assessment of Crocodile in the Sundarban" project 140 Salt Water Crocodile recorded. Besides, 184 nos. of Salt Water Crocodiles were reproduced in the Karamjol wildlife breeding centre to release in the nature (Sundarbans). 4) Under the Batagur baska Conservation project, Batagur baska population has been increased to 359 in the Batagur baska Breeding Centre of Karamjol, Sundarban through captive breeding program. In addition, recently

Sl no	Agenda	Actions taken
		79 nos. of Hatchlings were added in the Batagur baska population. 5) Under Dolphin project, some survey & Research works have been conducted in the Sundarbans & adjacent areas. It is to inform that 1070 hectares of Sundarbans (Dangmari, Chadpai and Dudhmukhi) was declared as Wildlife Sanctuary in 2012 for dolphin conservation. Recently, 03 new Dolphin Wildlife Sanctuary (Pankhali, Shibsha and Vodhra) with an area of 3427.0 hectares has been declared by the Government and 7 DCTs (Dolphin Conservation Team) are working in the field along with FD (Forest Department) staffs and Co-Management Committee to aware local people for Dolphin conservation, rescue the stuck dolphins, to monitor the Dolphin Sanctuaries etc. 6) Assessment of tiger carrying capacity in the Sundarbans has been conducted by Forest Department in 2019 and it was found that at present the Sundarbans can support in an average 164 nos. of tigers with the food and habitat support of present days. **Flora** 1. Besides, research on Sundarbans Flora also conducted by Bangladesh National Herbarium and Bangladesh Forest Research Institute. Research on "Floristic Survey conducted on Sundarbans Mangrove Forest of Bangladesh (2015)" identified that Sundarbans Bangladesh part has 528 species of Vascular Plants, among them 345 species are herb, 89 species of shrub and 94 species of tree. Prain (1903) first recorded 334 species of Vascular Plants in the entire Sundarbans (Bangladesh and India), among them 203 species are herb, 81 species of shrub and 54 species of tree. 2. Non-Vascular plants and recorded 30 species of marco algae; Basak et al. (2005) recorded 10 species of lichen; Das et al. (2016) recorded 32 species of macro fungi and Ahmed (2017) recorded 250 species of macro fungi. 3. Bangladesh Forest Research Institute conducted Regeneration Study on Sundarbans in 2019 at 33 Permanent Sample Plot (PSP) and recorded 32444 seedlings/ Hectare which was 27414 seedlings/ Hectare in 2018.
04.	On Bi-annual meetings (could be held at field director level) On Monthly meetings (could take place at DFO level along with the meeting of security forces)	On Bangladesh part, officers have been nominated for the Joint Border Meeting.

Sl no	Agenda	Actions taken
05.	Reserving seats for personnel from Bangladesh in the nine months Diploma course in the wildlife Institute of India, Dehradun.	Bangladesh Forest Department has collaboration with Wildlife Institute of India (WII) on capacity building and research. In 2019-2020 fiscal year, 06 forest officials have been participated at Wildlife Institute of India for 10 months diploma program (03 officers) and 03 months certificate course (03 officers).
06.	Illegal exploitation of marine biodiversity using harmful gears.	In 2014, Swatch of no ground of Bangladesh was declared as Marine Protected Area with an area of 173,000 hectares. A proposal on Biodiversity conservation of Swatch of no ground is under consideration. The proposal may be discussed in the 2nd meeting of JWG for joint intervention.
07 & 08	Measuring the scale of dependency of adjacent community on Sundarbans ecosystem and study of the Sundarbans dependent community and their alternative livelihood. Study of the indicators to measure health of the ecosystems of Sundarbans	Proposal on "Modalities for study to measure health of the ecosystems of Sundarbans" and joint modalities proposal on "Study of the Sundarbans dependent community and their alternative livelihoods" have been developed for Bangladesh part. This may be discussed on the 2nd meeting of JWG for working decision. Under different projects of Forest Department like Sundarbans Environmental and Livelihood Security (SEALS) project, Climate Resilience Ecosystems and Livelihoods (CREL) project, SDBC project, Bengal Tiger Conservation Activity (BAGH) project, Sundarbans Management Project (SMP-I) project, Dolphin project, about 73840 individuals of Sundarbans dependent community received alternative income generation (AIG) support/ training.
09	Joint identification of research need, joint research and incorporation of research findings in the Sundarbans management practice for the whole Sundarbans ecosystem.	Some research proposals and modalities on "Impact of Climate Change on the Sundarbans ecosystem" have been developed. This may be discussed on the 2nd meeting of JWG for working decision.

In compliance with the principal Goal of Protocol on Tiger conservation, the first meeting regarding Trans-Boundary Tiger Conservation was held in Kolkata, India on 20th December 2019. The Committee has decided to work together for conservation of Tigers of the Sundarbans.

2.3 Decision no. 4

Appreciates the confirmation that any future dredging of the Pashur River will be subject to an Environmental Impact Assessment (EIA), reminds the State Party that EIAs should be conducted in line with the IUCN World Heritage Advice Note on Environmental Assessment and include a specific section on the potential impact of the project on the OUV of the property, and also requests the State Party to ensure that any dredging within the property is conducted in compliance with strict conditions that safeguard the property's OUV and further requests the State Party to provide information on dredging activities.

Response

Maintenance dredging is required to maintain the navigability of the Mongla Sea Port on the Pashur River. Since 1979 Mongla Port has been performing maintenance dredging to keep the port operational.

The government of Bangladesh has controlled environmental polluting activities in and around Sundarbans Reserve Forest which is accelerating the improvement the ecological condition of the Sundarbans. For the future dredging activities at Pashur River, EIA approval is obligatory according to the Environment Conservation Act 1995 and Environment Conservation Rules 1997 of Bangladesh. The EIA study for the maintenance dredging at the Inner Bar of Mongla Port Channel (Pashur River) has been conducted in line with the IUCN World Heritage Advice Note where an specific section (Chapter-8[1]) has been detailed out about the OUV of the property. Moreover, multitier environmental monitoring has been framed out for safeguarding the SRF during dredging time.

It is assumed that, by now, the maintenance dredging has been adopted by the river ecosystem and safeguarding the OUV of WHC. No dredging activities are being conducted during fish breeding seasons. Information on dredging activities in Pashur River is as follows:

2.3.1 Information on Dredging Activities

a. Ongoing Dredging Activities within the Sundarbans area and its periphery

a.1. Inner Bar Area

Currently, following an approved EIA[1], dredging is being carried out at seven locations in the inner bar: a) Turning Ground: 0.12 Million sq.m., b) Jetty Front: 0.25 Million sq.m., c) Confluence Channel: 1.13 Million sq.m., d) Mooring Buoy: 1.0 Million sq.m., e) Base Creek: 1.88 Million sq.m., f) Anchorage: 1.6 Million sq.m. and g) Harbaria: 0.50 Million sq.m. The dredging locations and potential dredged materials' disposal locations are presented in the Figure 1 and 2. Inner bar dredging in ongoing and expected to complete by June 2022. The Environmental Management Plan (EMP) and monitoring activities are being followed during the execution of dredging.

As per recommendations of EIA, the dredged material is being disposed at the east side of Pashur River through constructing embankment. The environmental study finds that, the dredging project will generate overall positive impacts on the socio-economic conditions of the entire Khulna region. The study recommended that, the project is socially acceptable and environmentally sustainable.

Dredged materials will be disposed in designated location following environmental code of practices and EMP. Both Mongla Port Authority (MPA) and the contractor shall abide by relevant environmental rules and regulations as stipulated in the EIA report for protection of aquatic fauna and flora.

1

http://mpa.portal.gov.bd/sites/default/files/files/mpa.portal.gov.bd/page/3f7a636e_88e0_4a95_a007_cf459a098f11/2020-08-18-10-19-7a59fbc532ddc0432e0cfeae1f8ceb0b.pdf

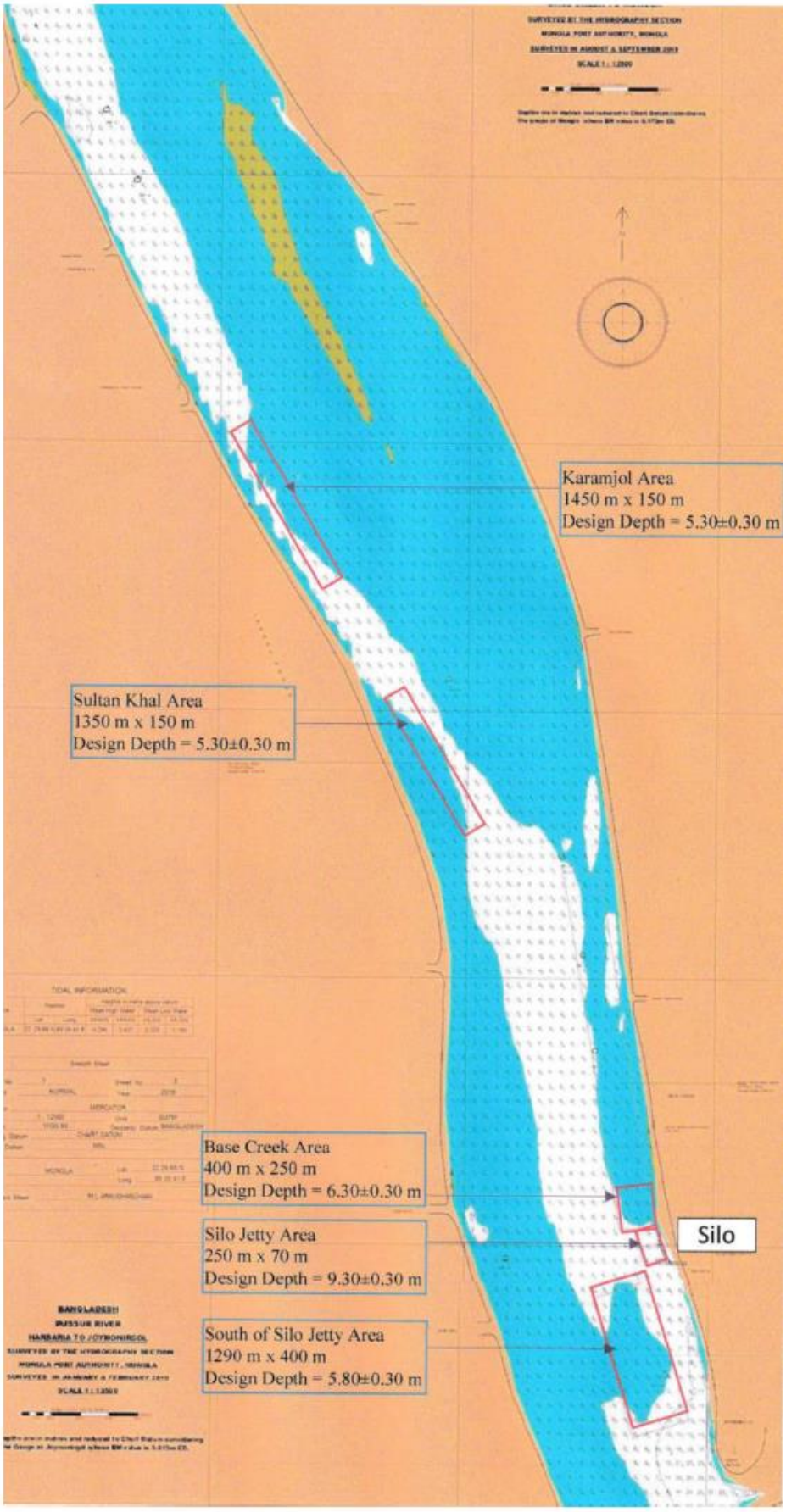


Figure 1: Joymonirgol Dredging Area in Pashur River



Figure 2: Inner Bar Dredging Area in Pashur River

2.4 Decision no. 5

Welcomes the State Party's actions, such as the implementation of the integrated freshwater inflow management plan, the implementation of Spatial Monitoring and Reporting Tool (SMART), the development of the Tiger Action Plan (2018-2027) and National Tiger Recovery Programme (NTRP), expansion of the wildlife sanctuaries and the adoption of Bangladesh Delta Plan 2100 to protect and expand the Sundarbans.

Response

An updated report on ecological monitoring of the property was given in the progress report of 41COM 7B.25 decisions in December 2018 as well as to the RMM 0f 2019. The updates on those programs are as follows:

2.4.1 Spatial Monitoring and Reporting Tool (SMART) Patrolling in the Sundarbans

SMART (Spatial Monitoring & Reporting Tool) based monitoring system is being implemented in the Sundarbans. This monitoring system will be very much helpful to monitor and protect the resources (floral, faunal and aquatic) for the Sundarbans especially in regards to protecting wildlife poaching, smuggling and illegal fishing. Due to SMART patrolling wildlife poaching smuggling and illegal fishing have been reduced appreciably.

SMART patrolling in the Sundarbans West Forest Division started in June, 2015 for the first time in Bangladesh. During the years prior to the SMART implementation, the rate of offender arrest was about 1-2 arrest per month while the SMART patrol team's arrest rate was more than 25 arrest per month preceding implementation of SMART patrolling.

To support the implementation of the SMART patrolling approach in the SRF- BFD and Wildlife Conservation Society (WCS) of Bangladesh with support from GIZ and inputs from Wild-Team (a local NGO) have jointly developed, 1) a SMART Operating Procedures (SMART-OPs) for Law Enforcement and Wildlife Monitoring in the Sundarbans, and 2) a Handbook for SMART Patrols in the Sundarbans Reserved Forest. The WCS of Bangladesh has also helped BFD for developing a configurable data model for data collection via Cyber Tracker-equipped handheld devices.

During January, 2019 to April 2021, a total of 264 patrols were conducted along 167,329 km channels during 1411 days of patrol effort. During the patrolling, 35,192 sightings of 67 key wildlife species were recorded. In this time period total 910 offenders were arrested. During the patrolling total 537 boats or transports and 601 fishing and crab harvesting gears, 167 cutting tools, 9 poison fishing were seized.

Yearly reports of SMART patrolling shows that the forest offences, specially wildlife related offences has decreased from 2019 to 2021.

2.4.2 Bangladesh Tiger Action Plan (2018-2027)

Second generation Tiger Action Plan (2018-27) has been approved by the MoEFCC. The Bangladesh Tiger Action Plan (BTAP) is a policy level document that offers a structured approach to achieve long-term conservation of tigers in Bangladesh. The first generation BTAP was for the period 2007-2017. It provides a vision, goals and objectives to guide an integrated and focused tiger conservation program.

- The vision is to ensure 'protected tiger landscapes in Bangladesh, where wild tigers thrive at optimum carrying capacities so as to perform their ecological role, and which continue to provide essential ecological services to mankind'.
- The main goals to address threats are to increase the current tiger population, maintain sufficient prey and habitat, and to address challenges are to improve conservation capacity, improve law enforcement, build capacity and proper mechanism for awareness and education programs as well as community involvement, build capacity to conduct tiger conservation research and monitoring, and encourage collaboration.
- The implementation of this BTAP will ensure that the nation attempts to sustain the current tiger occupancy in over 6,017 sq. km. and increase the density in the Sundarbans from the current 2.17 to 4.50 tigers per 100 sq.km. within the next ten years. Systematic monitoring and evaluation of progress against the BTAP goals will be done to enable the

adaptation of conservation activities. Bangladesh Forest Department, under the Ministry of Environment and Forests, is the primary custodian of the forest and its wildlife, but the immense task of tiger conservation necessitates support and expertise outside the normal regime of forest management. Therefore, the establishment of a Bangladesh Forest Department-led platform that facilitates collaboration for the implementation of conservation activities will be fundamental to its success.

In compliance with the Tiger Action Plan (2018-2027) a project for Tiger conservation titled "Tiger Conservation Project (TCP)" in the Sundarbans (Project period: July, 2020 to June, 2023) is on process and expecting to start very soon after approval from the Government. The principle objectives of the project are to survey of tiger population through camera trapping, survey of population of tiger prey animals, relocation of tigers to the areas of Sundarbans where tigers are not naturally found, installation of satellite collar in tigers to monitor the translocated tigers, to measure the relative density of tigers in the Sundarbans through Khal (Canal) survey, reduction of Human tiger conflict etc.

2.4.3 National Tiger Recovery Program (NTRP)

As a party to the Global Tiger Recovery Program (GTRP), Bangladesh had produced its first version of the National Tiger Recovery Program (NTRP) in 2010 and the revised version has been prepared for the period of July 2017 to June 2022.

- The NTRP presents additional effort that Bangladesh needs to make in order to accelerate the implementation of the Bangladesh Tiger Action Plan (BTAP) with a focus on priority actions.
- The goal of NTRP of Bangladesh is: 'by 2022, a demographically stable tiger population, greater than the current tiger population, under the scientific management and conservation in the Sundarbans.
- The priority actions to achieve the goal include building institutional capacity, engaging local communities, protecting habitats, and trans-boundary collaboration.

In compliance with the NTRP the following steps are taken from Bangladesh Government

- With the joint collaboration of Forest Department, Police, Border Guard, Customs and Coast Guard a Wildlife Crime Control Unit (WCCU) has been established. It is playing a vital role in the protection and conservation of tiger and other wildlife.
- Tiger Co-ordination Committee (TCC) has been formed in national and regional level to control wildlife poaching and illegal trafficking and working effectively.
- To reduce the human-tiger conflict, 49 Village Tiger Response Team (VTRT) with 332 community people and a 3-member Forest Tiger Response Team (FTRT) has been formed and working at the Sundarbans Impact Zone (SIZ).
- Compensation Policy for wildlife victims, 2012 has been approved which is helping to reduce the human-tiger conflict in the Sundarbans Impact Zone.
- The GoB has become the member of CITES, GTI, GTF and SAWEN for the conservation of biodiversity of the country including the SRF.
- Estimation of Tiger Population in the Sundarbans through camera trapping in 2015 and 2018.

2.4.4 Expansion of Wildlife Sanctuary

With the objective of conservation of flora and fauna of the Sundarbans and to maintain and undisturbed breeding ground for wildlife, three wildlife sanctuaries encompassing an area of about 1,39,700 hectares were declared as Sundarbans East Wildlife Sanctuary, Sundarbans West Wildlife Sanctuary and Sundarbans South Wildlife Sanctuary in 1996. This area of three Sanctuaries has been extended to 3,17,950 ha in 2017. Recently, three dolphin sanctuaries (Dhangmari, Chandpai and Dudhmkhi)

measuring an area of 1070.0 hac have been established in 2012 at eastern portion of the Sundarbans and another three dolphin sanctuaries in and around the Sundarbans (Shibsha. Bhodra and Pankhali) measuring an area of 3427 hectare have been established in 2020 for conservation of Ganges River dolphin and Irrawaddy dolphins. Now, the total area of wildlife sanctuary covers about 53.59% area of the Sundarbans. Collection/extraction or harvesting of all kind of resources is strictly prohibited inside these sanctuaries.

2.4.5 Initiatives for Dolphin Conservation (including protected area declaration)

Waterways of the Sundarbans mangrove forest support the Endangered Ganges River dolphin and Vulnerable Irrawaddy dolphin, the last two remaining species of freshwater dolphins in Asia. The density of Ganges River dolphin is particularly high in the low-salinity eastern portion of the mangrove forests with greater concentrations found at channel confluences. The density of Irrawaddy dolphins is high in the high-salinity western portion but the range of both species overlaps in the eastern side.

Considering the above-mentioned context, Bangladesh Forest Department in partnership with the United Nations Development Program in Bangladesh (UNDP-Bangladesh) and with support from the Global Environment Facility (GEF), has implemented a project titled **'Expanding the Protected Areas System to Incorporate Important Aquatic Ecosystems (EPASIIAE)**' in the Sundarbans.

Activities for Dolphin conservation

Various activities have been implemented for conservation of Dolphin in the Sundarbans. Some of the major activities are mentioned below-

Expansion of the coverage of dolphin PA in and around the Sundarbans

Three dolphin sanctuaries (Dhangmari, Chandpai and Dudhmkhi) measuring an area of 1070.0 hectares have been established in 2012 at eastern portion of the Sundarbans and another three dolphin sanctuaries in and around the Sundarbans (Shibsha, Bhodra and Pankhali) measuring an area of 3427.00 hectares have been established in 2020 for conservation of Ganges River Dolphin and Irrawaddy Dolphin.

Through the support of the project the Sundarbans were surveyed to identify hotspots for dolphin. In the survey 6 (six) new hotspots and 4 (four) semi-hotspots are identified. Based on this study three new hotspots have been considered as to be declared as sanctuary (new) for dolphin.

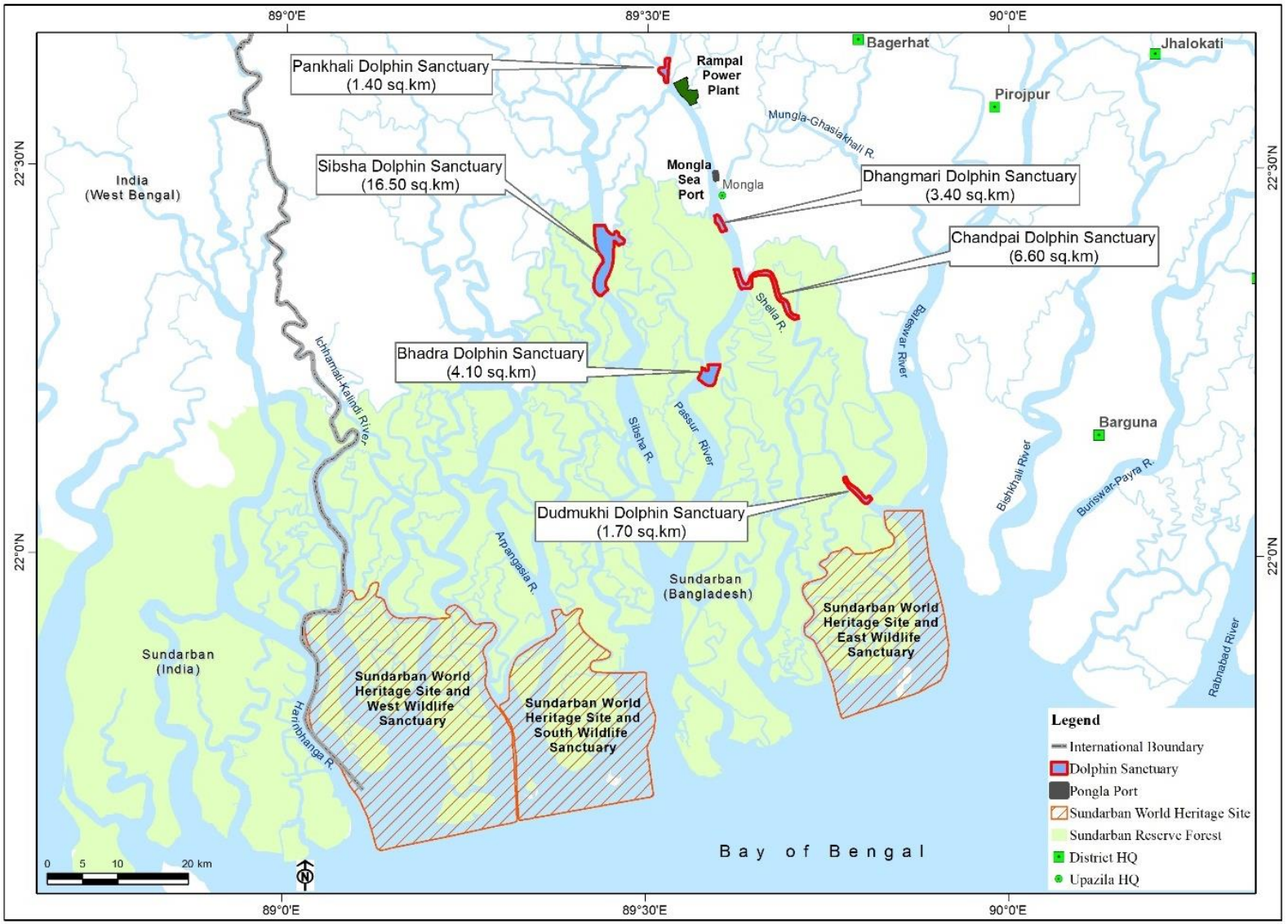


Figure 3: Existing Dolphin Wildlife Sanctuary in the Sundarbans

Introduction of an Effective Management System in the Existing PA Established for Dolphin Conservation in the Sundarbans

The Forest camp staffs were provided training on GPS based patrolling in the camp area. One hundred and ten staffs of 8 (eight) sanctuary associated forest camps have been imparted training on dolphin biology and behavior with an aim to capacitate on dolphin conservation. Apart from these they have also been provided with fuel and other logistic support such as patrol vest, rain coat, GPS, GPS Batteries, fuel container, hand mike, torchlight etc. These efforts have already proved to be effective in the management of the sanctuary and the management effectiveness score has been increased.

Enhancement of Alternative Livelihood Options for Local Fisher Folk to Reduce their Dependency on Aquatic Resources

For reducing the excessive pressure on the aquatic resources the project has provided livelihood support (worth of BDT 40,000 for each) for 1,000 (one thousand) households. They have been imparted training based on their choice, experience and willingness. After imparting training by the experts they are given supports. Most of the common trades are crab farming, goat rearing, van, small business tea stall, cloth business, tailoring etc.

Dolphin Conservation Team (DCT) formation is an iconic item of the project. Under the project, 7 DCTs with 70 community people have been formed with the objective to help forest department for dolphin conservation by providing information on illegal activity (if there is any) in the dolphin sanctuary. Each DCT has 10 (ten) volunteers who are local inhabitants residing beside the sanctuaries. Members of 7 DCTs (Dolphin Conservation Team) are working in the field along with FD (Forest Department) staffs and Co-Management Committee to aware local people for Dolphin conservation, rescue the stuck dolphin and to monitor the Dolphin Sanctuaries etc. The 7 DCTs have been provided with 0.3 million BDT each and total 2.1 million BDT as SEED MONEY (deposited as Fixed Deposit) under the project **'Expanding the Protected Areas System to Incorporate Important Aquatic Ecosystems (EPASIIAE)**' to continue their operations and conduct their meetings from the interests of the deposited money.

2.4.6 Involvement of Local Communities in Co-management of the Sundarbans Reserved Forests (SRF)

Co-management activities was initiated in the Sundarbans in 2009-10 to ensure equitable participation and distribution of rights and benefits received from the natural resources. For 3 (three) Protected Areas in the Sundarbans, (viz, Sundarbans East Wildlife Sanctuary, Sundarbans West Wildlife Sanctuary, Sundarbans South Wildlife Sanctuary), 4 (four) Co-Management General Committee (CMGC) as well as 4 (four) Co-Management Executive Committees (CMEC) were formed. Here 211 Village Conservation Forums (VCF) are working consisting of 32,774 community people (3140 in Sharonkhola range, 6140 in Chandpai range, 12094 in Khulna range and 11400 in Satkhira range), 4 (four) People's Forums (PF), 22 Community Patrolling Groups (CPG), 49 Village Tiger Response Teams (VTRT) and 7 Dolphin Conservation Team (DCT) are working. The Co- management activity is regulated by the Protected Area Co- management Rules, 2017.

Role of Co-Management Bodies

The current Co- management bodies are more functional for conservation of the Outstanding Universal Value (OUV) and ecosystem of the Sundarbans than the previous time.

At present, the 4 CMCs have a total financial resources of 5.039833 million BDT (2.858906 million BDT of CMGC and 2.180927 million BDT of DCT). Besides, the CMC members have been provided with short term loan of 2.807580 million BDT to purchase Water tanks, Gas stoves etc. for their better living and to promote alternative livelihoods like purchasing of Easy bikes, Auto Vans, honey cultivation, handicrafts etc. from the fund of CMCs.

Members of CPG, VCF, PF, VTRT, DCT do the patrol work along the borderline of the Sundarbans with the Forest Departmental Staff. Besides, VTRT and DCT members are dedicatedly working with Forest Departmental officials for Tiger and Dolphin conservation respectively. Besides patrolling, the Co-management bodies give information regarding the forest offences to the concerned forest office and the SMART patrolling team as well. After initiation of Co-management approach, the level of forest offences reduced significantly. These teams play a vital role at the time of rescue of wild lives from the adjacent

villages and releasing them in the nature. Thus, the Co-management approach playing very important role for the conservation of the Outstanding Universal Value of the Property.

Community Patrolling Group (CPG)

This group patrol along with forest departmental staffs and give messages about any illegal forest offence and offender. At present, 22 CPG groups (196 members) working on 4 ranges in the Sundarbans. So far, the CPGs covered about 4500 nos. of patrolling along with forest departmental staffs and rescued more than 250 nos. wildlife from adjacent locality to the Sundarbans and released them to the nature (Sundarbans Reserved Forest). A recently approved project (approved on 05/01/2021) titled "Sundarbans Surokkha (in English- 'conservation') Project aims to provide daily allowances to the VCF members for patrolling along with Forest Departmental officials. This may inspire the VCF members for patrol to prevent forest offences and encourage them for the conservation of the OUV of the Property.

Village Conservation Forum (VCF)

The VCF members provide important messages regarding poaching and illegal forest offence as like Poison fishing, hunting and any type of illegal entrance to the Sundarbans Reserved Forest. So far, they are aware about 7700 people for the conservation of the Sundarbans.

Dolphin Conservation Team (DCT)

This team works on awareness building for the conservation of Dolphins in the Sundarbans. They do patrol in the Dolphin sanctuary areas and aware the fishermen not to fishing in the Dolphin sanctuary areas. Besides, they inspire the fishermen to engage in alternative livelihoods and release stuck Dolphins to its nature. DCT has an FDR (Fixed deposit) amounting BDT 2.2 million BDT. The interest coming from this amount is used for awareness programs for Dolphin conservation. So far, they released 08 nos. of stuck Dolphins to the nature, conducted 54 nos. of meetings and 32 nos. of short training programs and aware more than 2500 people for the conservation of Dolphins.

Village Tiger Response Team (VTRT)

This team rescue stray Tigers from the villages adjacent to the Sundarbans, rescue wild lives like python, wild boar, monkey, deer, crocodile, fishing cat etc. from the adjacent villages and release them to the nature (Sundarbans Reserved Forest). So far, they released 431 nos. of wildlife to the nature in association with Forest Departmental officials.

Sundarbans Resource User Groups (SRUG)

Under the project, "Management of the Sundarbans Mangrove Forests for Bio-diversity Conservation and increased Adaptation to Climate Change (SMP)", Sundarbans Resource User Groups (SRUG) were formed. SMP identified natural resource dependent households in Chandpai Range with varied dependency on the Sundarbans resources for livelihoods. Households whose 50% or more yearly income come from the resource collection in the Sundarbans were categorized as Sundarbans Resource User (SRU) and given choice to participate in lower co-management tier i.e., Village Conservation Forums (VCFs) if they are interested since good numbers of them were not part of VCF till then. A sub-group within VCF titled Resource Users Group (RUG) has been created with the participation of SRUs. Bi-monthly meeting for them has been provisioned to discuss resource collection, conservation best practices, problems faced during resource collection in Sundarbans, solutions they deserve etc. and bringing those into the attention of co-management through VCF to upper tiers. Good number of RUG members and leaderships also received training on 'Natural Resource Management' (focus on importance and ecosystem services of Sundarbans, resource collection best practices, associated rules and regulations, penalties associated to illegal harvesting etc.) and 'Organizational and Leadership Development' and executives of RUGs are regularly mentored. With these initiatives, effective participation of resource users in the VCFs increased, they are gradually been chosen for VCF's executive positions as well as representatives to the Peoples Forum (PF), their prioritized issues are more discussed than before. **To date, 39 RUGs are operating in Chandpai Range more than 2000 members, while replication of the same approach is in the process in Sarankhola Range.** Most of the VCF leaders also received training on 'Organizational and Leadership Development', 'Sundarbans and Gender Role in Conservation', mentored regularly with qualified staffs, supported to organize their bi-monthly meetings, organize participatory elections once tenure of executives and PF representatives completed, enhancing communications within and beyond co-management tiers, building good rapport with external service providers to help accessing benefits and services by the members. VCFs are also learning from peer-to-peer earning visits organized among

them and enhancing connectivity and solidarity as horizontal spheres. **Till date, nearly 6200 members enrolled in 37 VCFs in Chandpai Range while similar approach to upscale in 20 VCFs of Sarankhola Range.**

Provisions of Alternative Income Generation (AIG) opportunities of the forest dependent local community

Resource users of the Sundarbans are identified and provided with alternative income generation (AIG) opportunities to reduce pressure on the Sundarbans. Different GO and NGOs had been involved in providing AIG supports through projects in the Sundarbans. Improved cooking stoves, solar system, pond sand filter, rain rater harvesting units have been set up in the periphery of SRF. Training on AIG activities, kinds and grant have also been provided to the forest dependent people to reduce the pressure on the resources of Sundarbans.

Alternative livelihood activities for Sundarbans dependent community under previously implemented projects of Forest Department are as follows:

Project Name	AIG supports/ training recipient number	Comments
SEALS project	45000 persons (on Fish, duck and chicken rearing, handicraft and honey cultivation)	At present, most of the trained persons have shifted from resource harvesting from the Sundarbans to alternative livelihoods like Fish, duck and chicken rearing, handicrafts, honey cultivation/ bee keeping, vegetable cultivation, grocery shop etc.
CREL project	25400 persons (23000 persons on fish, duck and chicken rearing & vegetable cultivation, 1600 men for income increment program and 800 women for handicraft training)	
SDBC project	1940 persons (on Honey cultivation, crabs & shrimps processing, Golpata collection related training)	
BAGH project	500 persons (on Handicraft and honey cultivation)	
SMP project	2000 persons (on Sustainable resources use related training)	
Expanding the Protected Area System to Incorporate Important Aquatic Ecosystems (EPASIIAE) project – project for dolphin conservation.	1000 persons trained for AIG program (based on their needs, efficiency and previous experiences e.g., crab farming, goat rearing, van, small business tea stall, cloth business, tailoring etc.) and also BDT 40,000/- was given to each trainee.	

2.4.7 Current Conservation Measures

The state party has taken various measures for conservation of the natural ecosystem and Outstanding Universal Value (OUV) of the Sundarbans in recent times especially in the year 2020 and 2021. Considering the breeding season for most of the wildlife species, to ensure an undisturbed breeding ground for the wildlife, recently, Government prohibited the entrance of the tourists in the core zone (wildlife sanctuary) Sundarbans for the months of June, July and August. The Government has enacted the Compensation Rules for the Wildlife Victims, 2021 recently. Besides, the Government has taken some

projects for the Conservation of the natural ecosystem and Outstanding Universal Value (OUV) of the Sundarbans as well as the Natural World Heritage Site. The Current Conservation efforts have been taken and being taken under the different projects are stated below:

Sundarban Shurokkha (in English- 'Sundarbans Conservation') Project

The project with estimated cost 1570.00 million BDT was approved by the Government on 05th January, 2021. This project aims to adopt modern scientific management for the conservation of the Sundarbans as well as to provide climate resilient working environment to the Forest Departmental officials (including logistic supports) for better monitoring and management. The project is being implemented with the activities like –

- Detailed survey of flora and fauna of the Sundarbans, study on population status of major wild life species and characteristics of their habitat, study on salinity (of soil and water) and Ecological Monitoring. The project aims to establish a long-term ecological monitoring system for the Sundarbans. Through Ecological Monitoring, a complete data base and information system on parameters like soil, water, air, vegetation, animals etc. regarding the ecosystem and environment of the Sundarbans will be established which may provide accurate guidelines for present and future management to achieve the SDGs. Through training under this project, the capacity of Bangladesh Forest Department will be enhanced to continue the ecological monitoring activities by its own capacity after the end of the project. Research studies on forest bio-diversity, climate change, study on density and population of different types of wildlife, wildlife habitat, diseases of wildlife etc., study on population of six important aquatic species of the Sundarbans and the characteristics of their habitat, probable threats to the aquatic animals etc. will be conducted.
- Training to Forest Departmental officials for their capacity building (training on implementation of the Wildlife (conservation and security), Act, 2012 for controlling of wildlife related offences, for management of the Wildlife Sanctuary areas (as well as the World Heritage Sites),training on First Aid, SMART patrolling, Wildlife Habitat observation, Wildlife Sanctuary Management, Rescue of Wildlife, Using of GPS and Cyber Tracker for SMART patrolling, for computer data entry and networking, Co-management and Protected Area Management Rules, 2017, may be helpful for capacity building of Bangladesh Forest Department (BFD). Training on Detective Activities/Intelligence for the Community Patrolling Groups (CPGs) may be helpful for controlling of forest offences. The project will arrange round table Consultation Meetings with the community political leaders and other stakeholders for the Conservation of the OUV of the Sundarbans.
- Besides, under the project, there are provisions for training on Managing of Eco-tourism, Tour Guiding, Nature Interpretation etc. for the tour operators, tour guides, members of Co-management bodies which may play vital role for Alternative Livelihoods for the forest dependent resource user groups.
- Afforestation (homestead plantation, block plantation, assisted natural regeneration and enrichment plantation) in and around the surrounding areas of the Sundarbans to supply fuel wood for the local people.
- Establishment of GIS lab for GPS based tracking, Vegetation Mapping, Change detection analysis, Land use Mapping etc.
- Establishment of Mangrove Adaptation and Knowledge Centre (MAKC) and Establishment of Sundarbans Archaeological museum.
- Re–excavation of rivers and canals in periphery of north-eastern part to supply fresh water flow and to improve the navigability for fishers.
- Establishment of Desalinization plant and re- excavation of ponds to supply fresh drinking water for Forest Departmental officials and for wildlife.

- Updating of Integrated Resources Management Plan (IRMP)
- Permit system automation for the Resource Users and providing the resource users digital identification number
- Establishment of climate resilient field offices and Range offices
- Repairing works of offices, residential buildings, monitoring and inspection vessels, roads, gangway & pontoon for increase of management efficiency.
- Supplying of fiber body monitoring vessels, cyber trackers, GPS, computers etc.

Development and extension of Eco-tourism in Sundarbans project

The project with estimated cost 249.5 million BDT is being implemented with the objectives of improvement of Eco-tourism attractions in the Sundarbans (especially in the buffer zone areas), improvement of Eco-tourism facilities for the tourists, to decrease the dependency of the forest dependent people on the Sundarbans resources and improvement of their socio-economic conditions by engaging them in eco-tourism based alternative livelihoods and awareness raising of local people on environment friendly eco-tourism activities management.

- The project is being implemented with the activities like development of eco-tourism facilities in the existing eco-tourism spots, out of which, development of souvenir shops may provide Alternative livelihoods to the forest dependent resource user groups of the Village Community Forum (VCF). This project may also provide Alternative Income Generation Activities to the VCF members by facilitating boat cruising organized by the Co-management bodies. Interpretation and information Centre may be helpful for better scientific eco-tourism management since it helps the tourists to become enriched with information regarding the ecosystem, bio-diversity and OUV of the Sundarbans and the tourists become aware about what to do or not to do at different spots of the forest.
- Introduction of the Automated Identification System (AIS)/ Vessel Monitoring System (VMS) may make eco-tourism more secured to the tourists. It may also help to monitor the tourist vessels whether they are moving on the right track (approved routes) in the forest.
- The project aims to develop four new eco- tourism spots in the buffer area of the Sundarbans so that the Eco-tourism activities may be gradually shifted from the core zone area to the buffer zone area.
- The project is providing training to the Forest Departmental Officials, tour operators, tour guides, members of the Village Conservation Forum, local village leaders, students of schools and colleges adjacent to the Sundarbans for awareness raising for the conservation of the Outstanding Universal Value (OUV) of the Sundarbans as well as the World Heritage Site.

At present, the training activities are going on under the project.

Pond excavation and Re-excavation project for the supplying of fresh drinking water in order to sustainable Forest Management of the Sundarbans

The project is being implemented in the Sundarbans to supply fresh drinking water to the Forest Departmental officials and to the forest resource users as well as to the wildlife of the Sundarbans. The project aims to Excavate 4 new ponds and re-excavate 84 existing ponds in the Sundarbans. At present, Pond excavation and re-excavation works are going on under the project.

Re-establishment of Telecom system in Sundarbans project

This project is being implemented in the Sundarbans to re-establish the destroyed telecom system in the Sundarbans to control the forest offences and wildlife related offences, for better monitoring and enforcement, to gear up the administrative performs, for better vigilance over the Forest Departmental official engaged in monitoring, to modernize the telecommunication system to conserve the natural forest. This project aims to supply and establish the telecom system with sufficient numbers of VHF sets,

Repeater sets, required numbers of towers, walkie talkie handsets with solar power back up system for all telecom facilities.

Support to the Management of the Sundarbans Reserved Forest (SMP II) project

This project with estimated cost 648.8 million BDT is being implemented with the partnership of GIZ with the objectives of –

- continuation of SMART patrolling in the Sundarbans.
- to make the Co-management bodies more functional,
- Initiation of Ecological Monitoring and
- Updating of Integrated Resources Management Plan (IRMP).
- Under this project, Drone supported monitoring system (for the purpose of SMART patrolling as well as Ecological Monitoring) will be started very soon. For this reason, the Forest Departmental officials are getting training to operate drones. The training program was started on 19th March, 2021.

Mobile Apps based Development and post-development support of Eco-tourism in Sundarban for Bangladesh Forest Department (BFD)

This project is only to facilitate the Eco-tourism activities in the Sundarbans by providing online support to the intended tourists, tour operators and Bangladesh Forest Department (BFD) through mobile apps. The mobile app may be very much helpful for the intended tourists, tour operator's business and management functions as well as the monitoring and management functions of BFD. At present, the app development work is going on.

Special activities in COVID-19 pandemic situation

In the COVID-19 pandemic situation, the forest department staffs are performing their duties maintaining the rules of health. They are continuing the SMART patrolling as well as their routine patrolling activities for the conservation of the eco-system and the Outstanding Universal Value (OUV) of the property. Besides, under the project SMP-II, as COVID-19 mitigation measures for the Sundarbans the following activities are being done:

- Support to the Bangladesh forest department frontline staffs in the Sundarbans:

  Protective goggles - 1000, Reusable 3-layer facemask 4000, Raincoat 850, Rubber boot 850, Hand gloves 2000 pair and Hand washing station 33.
- Support to the forest dependent communities of Chandpai and Saronkhola Range:

  Cash support (BDT 1000)- 7000 Households and Aid package (equivalent to BDT 2000): 7000 Households.
- Environmental Awareness campaign- 500 students from 10 Schools, 300 parents and 20 teachers.

2.5 Decision no. 6

Notes with great concern the likely environmental impacts of large-scale industrial projects on the property's OUV, and urges the State Party to take all necessary mitigation measures to address the concerns previously expressed by the Committee and the 2016 joint World Heritage Centre/IUCN Reactive Monitoring mission.

Response

The Government of Bangladesh is committed to protect the Sundarbans for its national and international importance. The Department of Environment, Bangladesh has not given environmental clearance or

permission to the Orion power plant and Phase II of the Rampal power plant as well as to any large-scale industry adjacent to the Sundarbans World Heritage property since the decision of 41COM 7B.25 (2017). Caution has been taken before considering and approving any large-scale industry near the Sundarbans. The Maitree STPP Project in Rampal has been taken up after obtaining all requisite/ statutory clearances such as Environmental Impact Assessment (EIA) and Environmental Management Plans as per the Bangladesh Environment Conservation Act 1995 and Environment Conservation Rules 1997 (amended in 2010) in 2013.

Before submission of EIA report, an Initial Environmental Examination (IEE) report was prepared from July-September 2010 and submitted to DoE. Based on the IEE report, approval of Location Clearance by DoE was given in May 2011. Before approval of EIA study for Maitree STPP of Rampal various comments, questions were raised by DoE, individuals, societies, researchers, journalists, Members of National Committee for Saving the Sundarbans (NCSS) etc. and all were addressed in the final approved EIA report. Public hearing/disclosure on EIA Report was also done in April'2013. EIA report was approved on 05.08.2013 by DoE, GoB. The study was carried out following the Environmental Impact Assessment Guideline of DoE and the World Bank guidelines including multidisciplinary tools and techniques of Physical environment, Water resources, Agriculture, Land and soil, Fisheries, Ecology and Socio-economic surveys and investigation. Participation of local people was ensured through RRA, FGD and stakeholder consultation process. The Environment Management Plan as per EIA was prepared and being implemented since 2013 after the DOE approval of EIA. Further, a separate EIA study for Coal Transportation was approved in Jan 2018 after due diligence in line with the rules and regulations of Bangladesh and World Bank Guideline.

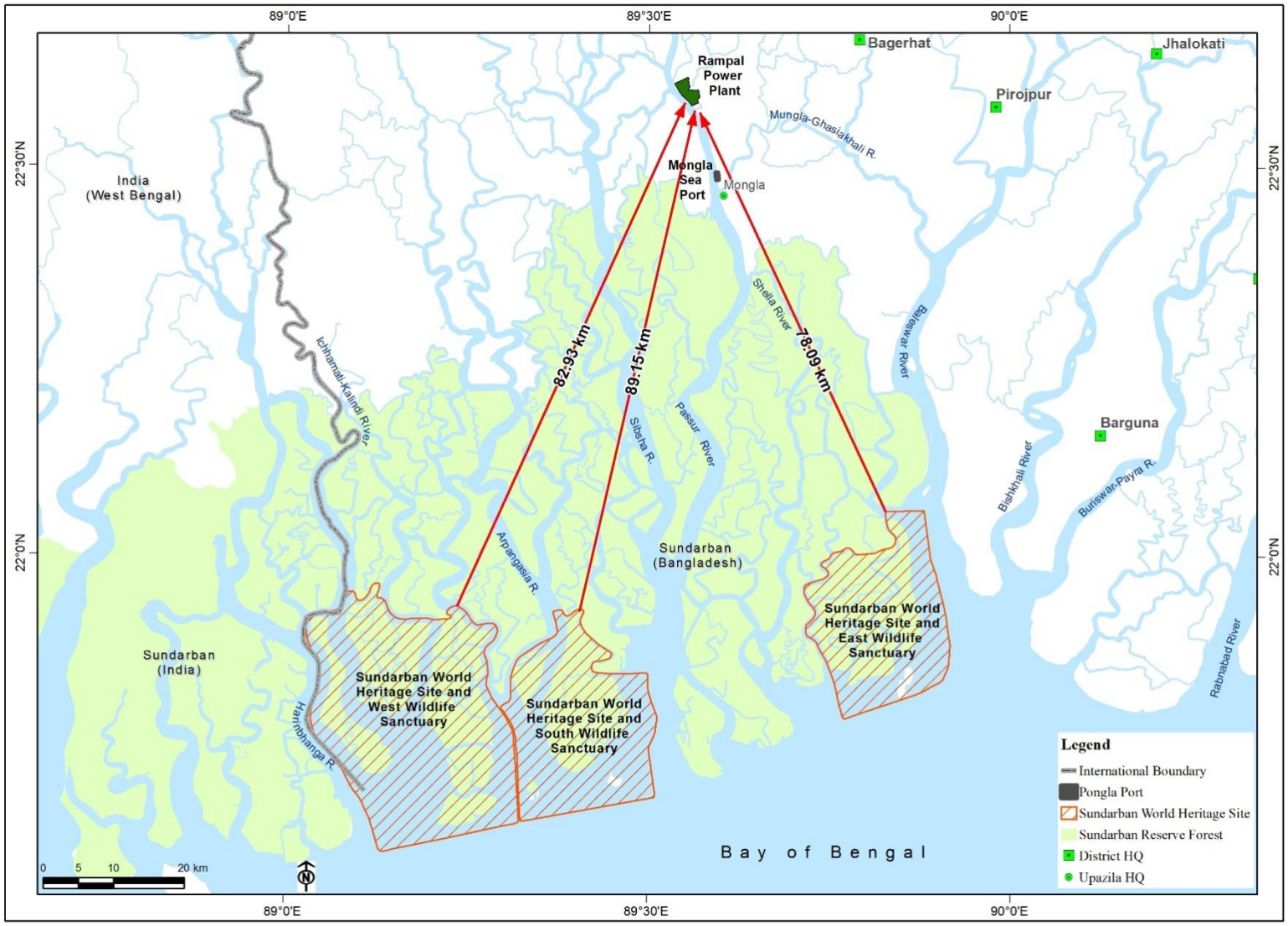


Figure 4: Location and Distance of Maitree STPP of Rampal from the Property

2.5.1 Current status of construction of the Maitree STPP, Rampal

Maitree STPP is being developed with all measures to safeguard the Sundarbans from potential hazards as recommended in EIA and RMM report in 2016. The work of project hampered due to COVID-19 outbreak. The Project is in 49th month of its execution plan and achieved 66% physical progress. Numbers of mitigation measures have been adopted to control the pollution from this power plant project.

A. Air Pollution Control

- **Modern & Efficient Technology**: High steam temperature and pressure to increase plant efficiency, less quantity of coal burning per unit of electricity output which results in lesser fuel consumption and less GHG emission.
- **Imported coal of High Calorific value** (around 6000Kcal/Kg), Low Sulphur and Low Ash content will be used.
- **Highly efficient wet limestone based Flue Gas De-sulphurisation System (FGD):** Highly efficient Wet limestone based FGD System shall be used to capture SO2 to control the emission of SO2 within the limit of 200 mg/Nm^3 as per WB/IFC guidelines. Further, high quality coal with low Sulphur content will be used for fuel. The average content of Sulphur in the coal will be around 0.6%. FGD System for SOx reduction includes -
    - Wet Limestone, Forced Oxidation type FGD system shall be used to remove SOx from flue gas.
    - Modern Japanese Technology based Double Flow Contact Scrubber type FGD of high efficiency shall be used.
    - To augment the cleaning of flue gas, very high purity limestone shall be used.
- **Electrostatic Precipitator (ESP)** of efficiency above 99% shall be used to collect the fly ash and to control emission of Particulate Matter (PM) within the limit of 50 mg/Nm^3 as per WB/IFC guidelines. It is pertinent to mention, some of the dust particles are also being captured in the FGD during scrubbing process, before the flue gas is exited from the chimney.
- **Advanced Low NOx Burner:** An effective and proven Low NOx burner technology is being used for reduction of NOx emission and control emission of NOx within the limit of 510 mg/Nm^3 as per WB/ IFC guidelines.
    - Formation of NOx in combustion is related to source of N2 from combustion air and organic Fuel. Combustion at near Stoichiometric air fuel ratio and at low temperature will result in less NOx generation.
    - Low NOx Tangential Firing system equipped with Closed Coupled Over Fire Air (CCOFA) and separate Over Fire Air (OFA), being used by BHEL (EPC contractor) has been developed by world pioneer in Steam Generator Technology, Alstom Power Inc. Alstom has a technology transfer with BHEL and Alstom is a qualified steam generator manufacturer (QSGM).
    - With this above technology of Low NOx firing system and low NOx burner, the emission of NOx will be maintained within the norms of international standards.
- **Chimney:** 275 m tall Chimney for wider dispersion of particulates leading to reduced ground level concentration.
- **Covered coal storage & enclosed coal conveyors** eliminate of fugitive coal dust.
- **Dust extraction & suppression system** in Coal Handling Plant.
- **Large scale afforestation** in and around the project which will improve overall environment/ ambience and also act as a carbon sink. Maitree Super Thermal Power Project, Rampal has an agreement to plant two hundred thousand saplings of different species. Till date around 116,000 saplings have been planted. These saplings consist of Mangrove species, Golpata, Fruit/ Medicinal Trees, and Coconut trees etc. BIFPCL is not only planting but also taking enough management care to ensure their growth

B. Water Pollution Control

- **Modern Induced Dart Cooling Tower (IDCT):** Provision of IDCT for Closed Circuit Cooling Water System to reduce the overall water requirement.
- Make-up water requirement is only 0.05% of lean flow period in the lean season, through Pashur River; discharge will be about half of this make up water. However, the entire water system has been designed for efficient water use where a series of water re-use provision has been kept. The treated water will be tried to reuse or recycle as much as possible.
- **No Thermal pollution of River water.** As per design, the Temperature of discharge water shall never be more than two degree centigrade (2^0C) above river water temperature at the edge of mixing zone which is as per stringent IFC norms.
- Dry bottom ash system to reduce intake water requirement instead of conventional wet bottom ash system and facilitate utilization of dry bottom ash.
- **Effluent Treatment Plant** are provided so that no effluents from the plant are discharged to the river without treatment.
- **Sewage Treatment Plants** are used to treat the domestic waste from the residential buildings, offices and other places
- For Hg present in coal, the amount of Hg will be only in traces, a large part of which will be collected in the dry form in the dry ash handling system and significant part of the remnant shall be captured in the downstream FGD equipment.

C. Ground Pollution Control

- **100% ash utilization for** this project is envisaged and accordingly required system for ash handling including Dry bottom ash instead of conventional wet bottom ash system is envisaged & under implementation. Ash management including design requirement of ash collection, transportation and loading to closed barge/ closed tanker for further utilization by ash utility is under implementation.
- Expression of Interest to buy dry ash from the plant has been received from Cement industries. It is found that demand of dry ash from the plant is 4-5 times more than 100% output.
- **High Concentration Slurry Disposal System (HCSD):** In addition, in the unlikely event of ash not being dispensed for a limited period, measures have been taken to collect and store the ash (during such period) through an advance technology i.e. HCSD to an ash pond of 25 acres to mitigate any contingency.
- Feature of HCSD system is that after mineral transformation of settled dense ash slurry, ash stone is developed whose main features are:
  - No water leakage to surface and ground water systems
  - No dissolution of ash components.
  - Hazardous components remain embedded
  - No dyke breeching, leaching and contamination
  - No dusting and ash/water runoff.
- High Concentration Slurry Disposal (HCSD) system is supposed to have no excess water. However, a recirculation system is envisaged for pumping any excess decanted water from the Dyke. Decanted water from ash pond of HCSD pond will be led to the plant area by using high

capacity pumps and the same will be conveyed from ash dyke to plant area. This water will be further used in the project area.

- Suitable protection from back water of the river all around the ash dyke has been envisaged. On downstream (D/S) slope of the dyke embankment, stone pitching with inverted filter arrangement shall be provided from G.L. to HFL plus 1.0 m height of dyke embankment. Provision shall also be made to protect the upstream slope of embankment. Rock-toe with toe drain shall also be provided at the toe of the embankment all around the ash dyke. In addition to that, ash pond with impermeable liner in compliance with statutory guidelines is envisaged to further ensure no leaching of water to sub soil/ground water contamination.

2.5.2 Fuel Transportation

As per the condition stipulated in the EIA study approval letter of DoE (August, 2013) for the proposed 2X660 MW Maitree STPP, BIFPCL has conducted Environmental Impact Assessment (EIA) study for Coal Transportation for Maitree STPP through third party and approved by DoE in January'2018. For coal transportation to the Ramplal Project site, daily 1-2 lighterage vessels will be operated in the Pashur river which is very insignificant with respect to existing number of vessels through established maritime route of Mongla Port.

Coal for Rampal Project will be transported using Purpose-built modern sea worthy vessel, tailor made as per IMO classifying norms covered vessels and environment friendly with very low effluent discharge, low SOx emission, low noise engine, GPS facility etc. Coal transshipment/ transfer to be done utilizing modern Environment friendly technology and best utility practices to ensure clean coal handling. Low noise vessels/ships will be used for coal carrying so that the aquatic lives of the river are not disturbed due to noise.

While carrying out the EIA study for Coal Transportation through the Pussur River, a sophisticated model (CALPUFF) has been used to determine the level of pollution at the World Heritage Site (Property). The result shows that the incremental level of pollutants (like SO_x, NO_x, PM_{10}, $PM_{2.5}$) at the Property is negligibly small and the cumulative level of these pollutants, considering the current base level and future additional pollution load from power plant, will remain very much within the limits (Table 1) specified by World Bank standards.

Table 1: A Comparative Scenario of Ground Level Concentration of Pollutant Ingredients before and after the Project Implementation at the Tip of Sundarbans (Annual average)

Polluting Ingredients	Present Status (µg/Nm3)	Status after Project Implementation (µg/Nm3)	Bangladesh Standard(µg/Nm3)	World Bank/IFC Standard(µg/Nm3)
NO_x (Annual Avg.)	2.2	2.3	100	40
SO_x (Annual Avg.)	2.1	2.2	80	Not available
$PM_{2.5}$ (Annual Avg.)	3.1	3.3	15	10
PM_{10} (Annual Avg.)	6.5	6.8	50	20

2.5.3 Measures taken During Pre-Construction and Construction Period

Environmental Management plan (EMP) is a part of approved EIA study. The main objective of the EMP is to guide the implementing agency to achieve sustainability of the project ensuring environmental conservation as per national and international standard.

The EMP includes mitigation, enhancement, compensation and contingency measures for each of the three phases of the project –

i. pre-construction,

ii. construction and

iii. Post construction/operation

The construction works of Maitree Super Thermal Power Project (MSTPP) is progressing well with preeminent prioritizing environmental and safety issues. A comprehensive checklist after due diligence, has been developed to monitor the environmental compliance of different components e.g., Environmental and Social Management System and Action Plan; Labor and Working Condition; Community Health, Safety and Security; Biodiversity and Sustainable Management of Living Natural Resources. Further, special thrust has been given to following areas while implementing the EMP measures:

- Noise management plan
- Air Quality management plan
- Water Quality management plan
- Waste management plan
- Safety at site
- Occupational Health and Safety procedure
- Construction site management plan
- Community Development Activities

Project Implementation authority has appointed third party monitoring agency for regular monitoring of environmental parameters in and around the power plant area and also from Khulna to the Sundarbans. The scope of Third party monitoring agency is as follows:

- Monitoring the compliance of DoE guideline and giving their observations.
- Specific monitoring parameters are being measured at locations in and around the project area and along the Pashur River up to Hiron point of the Sundarbans Reserve Forest.
- The reports are being shared with Concerned Ministries and local Authorities. Till date 26 quarterly reports have already been submitted.
- Environmental parameters viz air quality (particulate matter (24 hours continuous monitoring) at three locations inside the BIFPCL project area), discharge water quality and noise level are being monitored within the project area on monthly basis since April'2018
- The Monthly and Quarterly Reports are being uploaded on www.bifpcl.com, the official website of BIFPCL, accessible to public.

As evident from above 2x660 MW Maitree Super Thermal Power Project, Rampal is being implemented with modern state of the Art Technological systems to meet most stringent standards of DoE, Bangladesh and World Bank/ IFC (Table 2).

Table 2: Standards of Environmental Conservation Rules 1997, World Bank/ IFC and Maitree Super Thermal Power Project

Environmental Parameter	Bangladesh Standard	WB/ International Finance Corporation requirement	Maitree STPP parameters	Remarks
SO_2	--	EHSG - TPP 200 to 850 mg/Nm^3	200 mg/Nm^3	For Maitree project, the parameters are kept much lower than permissible limit of World standards.
NO_x	>No Standard Exists for coal Power Plant. >Boiler of Industrial Unit	EHSG - TPP 510 mg/Nm^3	510 mg/Nm^3	For Maitree, project, parameters are kept within permissible limit of World standards.

Environmental Parameter	Bangladesh Standard	WB/ International Finance Corporation requirement	Maitree STPP parameters	Remarks
	(600 mg/Nm^3)			
Particulate Matter	150 mg/Nm^3	EHSG - TPP 50 mg/Nm^3	50 mg/Nm^3	For Maitree, project, parameters are kept within permissible limit of World standards and much lower than Bangladesh Standard
Noise Pollution	Day time noise: 50db(A) Night time noise: 40db(A)	G-EHSG - Residential areas Daytime:55dB(A) Nighttime:45dB(A)	Daytime: 50 dB(A) Nighttime: 40 dB(A) (Measured along the site boundary of the plant)	For Maitree project, the parameters are kept lower than permissible limit of World standards and within Bangladesh Standard
Increase of ambient River Water temperature at the edge of mixing zone	--	Not more than 3 Deg. Celsius	Not more than 2 Deg. Celsius of the discharge point	For Maitree project, norms are kept lower than permissible limit of World standards.

2.6 Decision no. 7

Expresses concern that 154 industrial projects upstream of the property are currently active, and reiterates the Committee's request in paragraph 4 of decision 41 COM 7B.25 and welcomes the commitment of the State Party to continue the Strategic Environmental Assessment (SEA) requested by the same decision.

Response

The State party would like to reaffirm that there are only 20 (out of 24) red category industries operational around the Sundarbans. All existing 154 factories/farms/facilities operations were established before 2016, mostly in the 1990's and 2000's. A total of 130 factories, mills, cottage industries, agro-based livelihood activities under the Orange Category as well as 24 industrial facilities under the Red Category are situated around the Sundarbans. Other than the Red Category industrial facilities all other facilities/operations are mostly small scale enterprises based on agrarian livelihood.

Prominent among the 130 Orange Category Industries are 54 rice processing facilities, 14 fish farms/ponds, 8 ice factories and 8 welding workshops with the rest including grading mills, various factories, mills, restaurants and other facilities etc. Most of them do not emit or discharge any air/water pollutants to the surrounding environment. **Detailed and in-depth reporting on the 154 industries have previously been provided in the report submitted in January, 2020**.

Government of Bangladesh has not issued environmental clearance to any large-scale industrial/infrastructural development adjacent to the Sundarbans World Heritage property since the decision of 41COM 7B.25 (2017). Upon decision from the WHC, a project to conduct Strategic Environmental Assessment (SEA) of South West region of Bangladesh including the Sundarbans is under implementation by Bangladesh Forest Department (BFD).

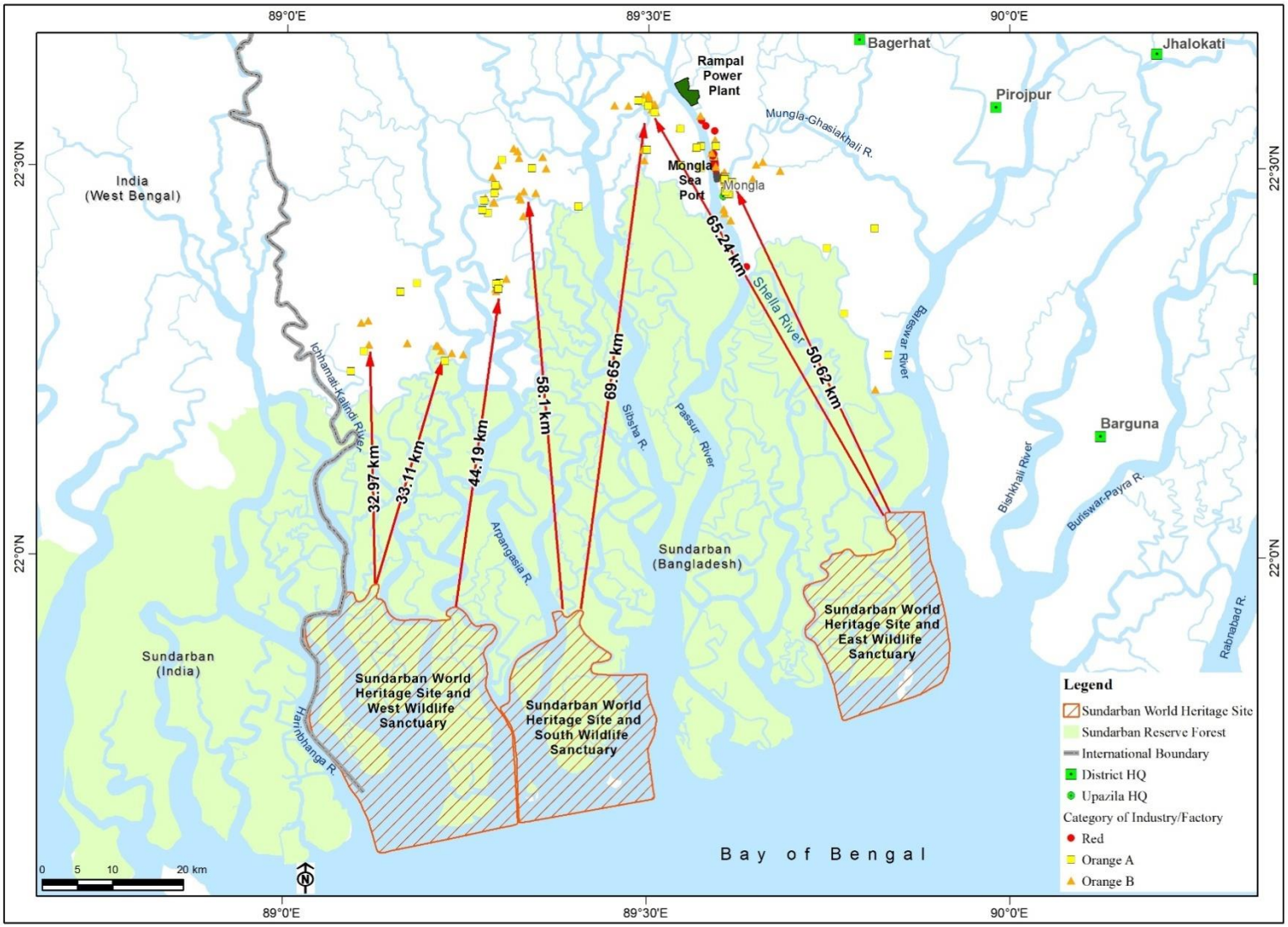


Figure 5: Location and Distance of the Facilities/Factories from the Property

2.7 Decision no. 8

Requests that the State Party implement the relevant recommendations of the SEA to all current and future projects and recalls the obligation of the State Party to submit to the World Heritage Centre, for review by the Advisory Bodies, detailed information including Environmental Impact Assessments for development projects, which have the potential to influence the OUV of the property before they commence in accordance with Paragraph 172 of the Operational Guidelines before work commences or any irretrievable decision is made.

Response

The Government of Bangladesh has not given any environmental clearance or permission to any large-scale industry adjacent to the Sundarbans World Heritage property since the decision of 41COM (2017). Terms of Reference of conducting SEA has already been shared with WHC.

In accordance with the ToR the joint ventured firm CEGIS & Integra Consulting of Czech Republic is conducting the SEA in compliance with OECD guidelines and operational guidelines of WHC. The Inception report, Prospectus and Screening and Scoping report covering a total 89 Policies, Plans and Programs (PPP) of 28 sectors relevant to South West region has already been prepared. From the baseline information of the SW region the key Environmental and Socio-Economic issues are considered for the SEA study. All the reports are available in the dedicated website: ***www.seasw-sundarbansbd.org***.

2.8 Decision no. 9

Regrets that the National Oil Spill and Chemical Contingency Plan has still not been finalized, and also reiterates its requests that the State Party ensure adequate provision of funding and human resources for the implementation of the plan once it is adopted, and provide further information and data on the monitoring of long-term impacts from recent shipping incidents involving spills of hazardous materials in proximity to the property.

Response

Final version (both English and Bangla) of the "National Oil and Chemical Spill Contingency Plan (NOSCOP)" has already been approved by the cabinet on 3rd February 2020 and published by the ministry of Environment, Forests and Climate change in both Bangla and English version in February 2020. A rigorous consultation has been done during development of the plan. The final version of the NOSCOP is attached herewith as Appendix A.

The following clause in the NOSCOP provides provision of funding and human resources for the implementation of the plan,

Finance Division of the Ministry of Finance will provide authorization for expenditure and funds for initial response and ensure adequate financial records are maintained.''

2.9 Decision no. 10

Requests that the State Party invites a joint World Heritage Centre/IUCN Reactive Monitoring mission to the property to assess the state of conservation, in particular the level of threats to the hydrological and ecological dynamics which underpin the OUV of the property and recommends that this mission takes place by the end of 2019.

Response

Upon the request of WHC the State Party invited the World Heritage Centre/ IUCN Reactive Monitoring Mission to visit the World Heritage Site in the Sundarbans. Accordingly the four members' mission visited the property and the Rampal Power Plant and consulted with different stakeholders from December 10 to December 15 2019. The mission inspected all areas according to their Terms of References. During the Sundarbans visit the Mission was briefed on updated management practices being implemented by the Forest Department such as Integrated Resource management Plans for the Sundarbans (IRMP) for 2010-20, Sundarban West Wildlife Sanctuary Management Plan (2015-2025), Community-based Resources Management Plan of the Wildlife Sanctuaries for Dolphins in Bangladesh Sundarbans (2019-2028), Fish Conservation/Management, Involvement of local community for conservation and monitoring, Alternative livelihood activities for Sundarbans dependent community under previously implemented projects of Forest Department and Forest inventory in the Sundarbans. The Mission also attended a consultation

meeting with local community, local public representatives and local administrative authority. The Mission also met with the Third party in the last day of their visit (Appendix B).

2.10 Decision no. 11

Finally requests the State Party to submit to the World Heritage Centre, by 1 February 2020, an updated report on the state of conservation of the property and the implementation of the above, for examination by the World Heritage Committee at its 44th session in 2020so that the Committee can decide on whether or not to inscribe the property on the List of World Heritage in Danger.

Response

This report along with all implementation updates is submitted as per decision number 11 of 43 COM 7.B 3.

3. Public access to the state of conservation report

The state party requests that the full report should be uploaded for public access.

Secretary

Ministry of Environment, Forest and Climate Change

Government of the Peoples' Republic of Bangladesh

