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**ORGANISATION DES NATIONS UNIES
POUR L'EDUCATION, LA SCIENCE ET LA CULTURE**

CONVENTION CONCERNING THE PROTECTION OF THE WORLD CULTURAL AND NATURAL HERITAGE

CONVENTION CONCERNANT LA PROTECTION DU PATRIMOINE MONDIAL, CULTUREL ET NATUREL

WORLD HERITAGE COMMITTEE / COMITE DU PATRIMOINE MONDIAL

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Item 7 of the Provisional Agenda: State of conservation of properties inscribed on the World Heritage List and/or on the List of World Heritage in Danger

Point 7 de l'Ordre du jour provisoire : Etat de conservation de biens inscrits sur la Liste du patrimoine mondial et/ou sur la Liste du patrimoine mondial en péril

MISSION REPORT / RAPPORT DE MISSION

**The Sundarbans (Bangladesh) (798)
Les Sundarbans (Bangladesh) (798)**

9-17 December/décembre 2019

REPORT ON THE JOINT UNESCO/IUCN REACTIVE MONITORING MISSION TO THE SUNDARBANS, BANGLADESH FROM 9 TO 17 DECEMBER 2019

Photo: © G. Broucke/UNESCO

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October 2020

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LIST OF ACRONYMS

AIG	Alternative Income Generation
BIFPCL	Bangladesh-India Friendship Power Company Ltd
BFD	Bangladesh Forest Department
CEGIS	Center for Environmental and Geographic Information Services
CT-EIA	Coal Transportation Environmental Impact Assessment
DoE	Department of Environment
EIA	Environmental Impact Assessment
ECA	Ecologically Critical Area
ECR	Environmental Conservation Rules
EMP	Environmental Management Plan
EPZ	Economic Processing Zone
ESP	Electro Static Precipitator
ETP	Effluent Treatment Plant
FGD	Flue Gas Desulphurization
IMO	International Maritime Organisation
IUCN	International Union for Conservation of Nature
JWG	India-Bangladesh Joint Working Group
MoEFCC	Ministry of Environment, Forest and Climate Change
MoU	Memorandum of Understanding
MPA	Mongla Port Authority
NOSCOP	National Oil and Chemical Spill Contingency Plan
OUV	Outstanding Universal Value
SEA	Strategic Environmental Assessment
SEWS	Sundarbans East Wildlife Sanctuary
SMART	Spatial Monitoring and Reporting Tool
SRF	Sundarbans Reserve Forest
SSWS	Sundarbans South Wildlife Sanctuary
STP	Sewage Treatment Plant
SWWS	Sundarbans West Wildlife Sanctuary
USCT	Ultra Super Critical Technology

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All people consulted during the mission are listed in Annex V, possible omissions are unintentional and exclusively the authors' responsibility.

EXECUTIVE SUMMARY AND LIST OF RECOMMENDATIONS

The World Heritage property “The Sundarbans” has been subject to a number of World Heritage Committee Decisions since 2013 when concerns over a proposed coal fired power plant in Khulna (1320 MW Maitree Super Thermal Power Plant, hereafter Rampal power plant) in the vicinity of the property first emerged. The Committee at its 38th session in 2014 noted with concern that the indirect impacts on the property of the construction of the power plant appeared to not have been assessed and also expressed its concern over other infrastructure projects and industrial development in the vicinity of the property in general (Decision **38 COM 7B.64**). A joint World Heritage Centre/IUCN Reactive Monitoring mission visited the property in 2016 and concluded that the main threats to the Outstanding Universal Value (OUV) of the property associated with the construction and operation of the Rampal power plant would include pollution from coal ash by air, pollution from wastewater and waste ash, increased shipping and dredging and the cumulative impact of industrial and related development infrastructure. It also concluded that these possible threats were not addressed adequately in the Environmental Impact Assessment (EIA) prepared for the power plant. The importance of conducting a Strategic Environmental Assessment (SEA) to assess the indirect and cumulative impacts on the OUV of the property arising from the Rampal power plant and other developments in its vicinity has been reiterated in every Committee Decision since 2014.

The 2019 joint World Heritage Centre/IUCN Reactive Monitoring mission was requested by the Committee in its Decision **43 COM 7B.3** and was tasked 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”.

This mission was undertaken between 9 and 17 December 2019 and had an opportunity to hold extensive discussions with representatives of different Ministries and agencies, as well as private sector and civil society organizations. The mission visited parts of the property, as well as the site where the Rampal power plant is being constructed.

The mission could observe that many of the threats identified by the 2016 Reactive Monitoring mission continue to be of concern and that while some progress has been achieved to initiate an SEA to assess their impacts on the property (as discussed further below), this initial step alone does not yet protect the property from possible negative impacts of different development projects.

With regards to specific projects, particularly the Rampal power plant, this mission report focuses on the additional information provided by the State Party and the changes in the project design occurred since the last mission, as a comprehensive assessment of the project had already been provided in the 2016 Reactive Monitoring mission report. Therefore the specific recommendations related to this project only focus on several new aspects discussed during the mission. Overall, the 2019 mission re-affirms that in the absence of a comprehensive assessment of cumulative impacts from the ongoing and proposed large-scale industrial developments, high concerns remain regarding their possible negative impacts on the property. Therefore the continuation of these developments in the absence of an SEA represents a potential danger to the property’s OUV.

Nevertheless, the mission also concludes that overall, the OUV of the property remains present. Hydrological dynamics in the Sundarbans have historically and more recently been altered by a number of factors and projects, such as construction of barrages and increasing water extraction, but overall, hydrological and ecological processes underpinning the OUV of the property, such as water quality, tidal influence, formation of deltaic islands and their subsequent colonization, continue their course, demonstrating the ecological resilience of the Sundarbans ecosystem for now. However, the cumulative impact from reduced freshwater inflow (including due to the construction of the Farakka Barrage in India in the 1970s), rising sea levels and changes in rainfall, as well as demographic and development pressures, have resulted in significant changes in the hydrology of the property. Due to the transboundary nature and hydrological connectivity of the property, effective bilateral cooperation between the States Parties of Bangladesh and India is very important, to ensure the protection and management of the property.

With regards to the property's important biodiversity values, the mission concluded that, as a result of conservation efforts, some of the key attributes of the property's OUV have been showing positive trends in recent years, particularly the population of the Bengal Tiger. However, due to deficiencies in monitoring data, the status of the populations of key aquatic fauna species, especially the two dolphin species (Ganges River Dolphin and Irrawaddy Dolphin) and the Northern River Terrapin, are worryingly unknown.

As noted above, the 2019 mission further concluded that the main threats identified by the 2016 Reactive Monitoring mission remain present, including those related to the construction of the Rampal power plant. The mission noted that significant efforts have been undertaken by the State Party to initiate a process of undertaking an SEA for the South-West region of Bangladesh, as was requested by the World Heritage Committee. However, it is important to note that, in the period since the SEA was first requested in 2014, developments have continued without the adequate assessment of potential impacts on the OUV of the property, against repeated requests of the Committee. It is therefore urgent and essential that developments are halted until the SEA is completed as soon as possible, to determine the appropriateness of developments in relation to World Heritage and the preservation of OUV. This SEA process represents an opportunity to ensure that all possible threats to the OUV of the property from current and proposed industrial development projects, specifically indirect and cumulative impacts, are comprehensively assessed.

This would be particularly important given the fact that the waterways constitute both an underlying basis of the OUV of the property and a vector for a potential spread of impacting factors. In this regard, indirect impacts of proposed industrial projects, such as the Rampal power plant, through increased shipping and therefore increased risks of accidents and associated pollution and increased need for ongoing dredging are considered as one of the main threats to the property's ecological process and its biodiversity. Presence of an international port in the vicinity of the property and expanding shipping corridors have also been reported as potentially facilitating export of poached tiger parts. The implementation of the SEA is imperative to provide the much needed planning instrument to allow the prevention of possible negative impacts on the OUV of the property by guiding future development plans and policies, including through identification of possible alternative solutions.

The overall conclusion of the mission is therefore that, while the property's OUV, including its hydrological and ecological processes and its biodiversity, continue to be present, the property continues to be threatened by possible impacts from large-scale industrial development. These potential impacts could cumulatively result in a high risk of the property's OUV to deteriorate if no further measures are taken based on a comprehensive assessment of existing and possible future negative factors and pressures. The mission therefore makes the following recommendations regarding the SEA:

- ***Prioritise the completion of the Strategic Environmental Assessment (SEA) for the south-west region of Bangladesh, in line with international best practice and with the support of the Netherlands Commission for Environmental Assessment (NCEA) as appropriate, and in consultation with the World Heritage Centre and IUCN. [R9]***
- ***Until the SEA is completed, ensure that no further decision is made for any new large-scale industrial and/or infrastructure developments in the vicinity of the property, including further development of the Mongla Port and any other development that might further increase traffic on the Pashur River. [R7]***
- ***Once the SEA is completed, ensure that the findings of the SEA become the basis for future decision making on developments in the vicinity of the property. [R10]***

In the course of developing the SEA:

- ***Ensure that the SEA not only covers the identified nine economic sectors, but also how they are interrelated and how plans and policies developed for one sector would potentially influence others, particularly what concerns shipping and associated infrastructure and maintenance, and that it includes a specific assessment of cumulative impacts on the property's OUV. [R12]***
- ***Ensure that shipping and dredging are included as priority sectors in the scope of the SEA, including long-term and least-impact options regarding the continued use of the Pashur estuary as anchor and transfer area, proposed measures to minimize the river traffic and its impact, and options regarding disposal of major and minor dredged materials. [R6]***
- ***Ensure that the SEA includes the water sector as a priority sector in its scope, and determines a range of scenarios for freshwater inflow in function of projected trends and water management interventions, against the corresponding impacts for the integrity of the property. [R17]***
- ***Ensure that the SEA, while aimed at developing a planning instrument for the South-West region of Bangladesh, also considers in its analysis, other relevant policies and proposed development plans in other areas, including outside the Bangladesh borders. [R13]***
- ***Ensure that key information related to the SEA (including ToRs, outline of the scope, stakeholder consultation timelines and approach, and methodology) is made publicly available, ideally through an online platform, and that the***

necessary public consultations are undertaken throughout the key steps of the process in an open and transparent manner. [R11]

- ***Establish a coordination mechanism, involving all relevant Ministries and agencies, to ensure the findings and recommendations of the SEA are implemented across all relevant national and regional plans and policies. [R14]***

The mission also concludes that it will be essential to ensure that the SEA provides an adequate planning instrument, whose implementation would ensure that no large-scale industrial development would be permitted in the vicinity of the property and no further intensification of shipping and dredging would occur if considered to have potential negative impacts on the OUV of the property. In case such negative impacts cannot be prevented, the property will be facing potential danger in line with Paragraph 180 of the *Operational Guidelines for the Implementation of the World Heritage Convention*. Therefore, the mission recommends that the World Heritage Committee review the progress achieved in the development of the SEA at the next session with a view to considering, in the case of absence of substantial progress and confirmation of the ascertained or potential danger to the Outstanding Universal Value, the possible inscription of the Sundarbans World Heritage property on the List of World Heritage in Danger.

Beyond these recommendations concerning the SEA, the mission also makes the following more detailed recommendations regarding the specific projects that were discussed during the course of the mission and that have been mentioned in previous World Heritage Committee Decisions, namely the Rampal, the Taltoli and the Kolapara power plants:

- ***Ensure greater use of the Independent Monitoring Panel, which was established to provide the State Party with advice on the construction and operation of the Rampal power plant, to address concerns from third parties over the construction of Rampal power plant. [R2]***
- ***Consider other functionally independent advisory panel processes, such as IUCN's Independent Scientific and Technical Advisory Panel (ISTAP), as possible models to ensure greater transparency and public trust in the process, and to expand the scope of communication and engagement with third parties to include the state of conservation of the property in relation to other industrial and power plant developments, and the SEA. [R3]***
- ***Monitor underwater noise pollution (vessel noise) in or near dolphin habitats/sanctuaries created by increased river traffic from coal shipments in the Pashur River and ensure that the issue of increasing noise pollution and its impacts on aquatic fauna is considered by the SEA. [R1]***
- ***Submit the study on the river dolphins in the Buriswar-Payra River with respect to the Taltoli (Barisal) power plant development and its associated increased shipping activities, to the World Heritage Centre for review by IUCN when available, and ensure any findings of negative impacts are immediately addressed through the implementation of mitigation measures. [R4]***

- ***Before proceeding any further with the development of the Payra Thermal power plant (also known as Kolapara power plant), develop a Dolphin Conservation Plan to prevent any adverse effects on the river dolphins that are present within the project area, and submit the Plan to the World Heritage Centre for review by IUCN as soon as it is available. [R5]***

As noted above, possible indirect impacts from industrial development through increased shipping and dredging are of particular concern and the mission therefore makes the following recommendations regarding the relevant processes and existing instruments:

- ***Clearly address the responsibility of the government to protect the OUV of the property in the National Oil and Chemical Spill Contingency Plan (NOSCOP), and develop an effective localized contingency plan covering the property in accordance with the national plan outlining measures to prevent any future oil and chemical spill incidents within and in proximity to the property and to ensure immediate and coordinated actions for mitigating impacts on the property in case of emergencies. [R8]***

Further recommendations by the mission include areas of transboundary cooperation notably in the area of freshwater management particularly in view of halting siltation trends and further risks for degradation of the ecosystem, which will be exacerbated from climate change-induced rainfall changes and sea level rise, as well as other conservation measures, including those addressing other threats to the property:

- ***Further strengthen and harmonize monitoring and conservation efforts between the States Parties of Bangladesh and India to improve transboundary management of the two World Heritage properties of "The Sundarbans" and "Sundarbans National Park" through the India-Bangladesh Joint Working Group (JWG). [R15]***
- ***Undertake a coordinated effort between the States Parties of Bangladesh and India to strengthen integration of the hydrology of the property and the Sundarbans National Park in India in bilateral cooperation, through:***
    - ***a) Inclusion of ecohydrological cooperation for the delta under the Bangladesh-India MoU on conservation of the Sundarbans;***
    - ***b) Incorporation of the long-term integrity of the property as a priority in the review of the Ganga Treaty between the States Parties, which expires in 2026, based on scientific models including the findings of the SEA. [R18]***
- ***Continue efforts to actively involve local communities in co-management of the Sundarbans Reserve Forest, and to provide sustainable alternative income generating (AIG) opportunities beyond the timeframe of the Integrated Resources Management Plans for the Sundarbans (2010-2020). [R19]***
- ***Convene a scientific advisory group/panel consisting of globally recognised experts in the Irrawaddy Dolphin and the Ganges River Dolphin to provide advice on establishing a baseline and long-term monitoring plan that includes***

a review of sampling sites and best available methodology including the use of the SMART system. [R16]

1. BACKGROUND TO THE MISSION

1.1 Inscription history

Inscribed on the World Heritage List in 1997, the Sundarbans World Heritage property (the property) covers a total area of 139,700 ha and is composed of three wildlife sanctuaries: Sundarbans West Wildlife Sanctuary (SWWS), Sundarbans South Sanctuary (SSWS) and Sundarbans East Wildlife Sanctuary (SEWS). The three wildlife sanctuaries are located in the southern coastal zone of the larger 595,000 ha Sundarbans Reserve Forest (SRF) and are managed by the Bangladesh Forest Department (BFD) of the Ministry of Environment, Forest and Climate Change (MoEFCC). Combined with the Sundarbans National Park in India (inscribed separately on the World Heritage List in 1987), the property is part of the largest mangrove system in the world.

1.2 Inscription criteria and World Heritage values

The property was inscribed on the World Heritage List under the following criteria:

- *Criterion (ix): The Sundarbans provides a significant example of on-going ecological processes as it represents the process of delta formation and the subsequent colonization of the newly formed deltaic islands and associated mangrove communities. These processes include monsoon rains, flooding, delta formation, tidal influence and plant colonization. As part of the world's largest delta, formed from sediments deposited by three great rivers; the Ganges, Brahmaputra and Meghna, and covering the Bengal Basin, the land has been moulded by tidal action, resulting in a distinctive physiology.*

- *Criterion (x): One of the largest remaining areas of mangroves in the world, the Sundarbans supports an exceptional level of biodiversity in both the terrestrial and marine environments, including significant populations of globally endangered cat species, such as the Royal Bengal Tiger. Population censuses of Royal Bengal Tigers estimate a population of between 400 to 450 individuals, a higher density than any other population of tigers in the world.*

The property supports exceptional biodiversity in its terrestrial, aquatic and marine habitats, ranging from micro to macro flora and fauna and is of universal importance for globally endangered species including the Royal Bengal Tiger (*Panthera tigris ssp. tigris*), Ganges River Dolphin (*Platanista gangetic*), Irrawaddy Dolphin (*Orcaella brevirostris*), and the critically endangered endemic Northern River Terrapin (*Batagur baska*).

1.3 Integrity issues raised in the IUCN evaluation report at the time of inscription

At the time of the IUCN evaluation in 1997, the wider Sundarbans region of Bangladesh and India had already been reduced to half its former size due to clearing and conversion of mangrove forest for agricultural use over the past 150 years. The evaluation also noted that freshwater inflow and water quality had also declined. Six animal species were considered to have gone extinct in the area over the past century including the Javan Rhino, Wild Buffalo, Swamp Deer, Hog Deer, Gaur and Mugger Crocodile.

There were no inhabitants in the Sundarbans wildlife sanctuaries at the time of evaluation, while the whole area was providing livelihoods for some 300,000 people working seasonally as wood-cutters, palm collectors, fishermen, and honey hunters. About two million people lived in surrounding villages and depended for much of their subsistence on products from the Sundarbans. As of 1997, the three wildlife sanctuaries accounted for 24% of the total SRF in Bangladesh and uses inside the area were strictly controlled.

The 1997 IUCN evaluation noted that there was no communication with staff working in the Sundarbans National Park in India. At the time of inscription, the World Heritage Committee encouraged the States Parties of Bangladesh and India to discuss the possibility of creating a transboundary site between the Sundarbans (Bangladesh) and the Sundarbans National Park (India) World Heritage properties.

1.4 Examination of the State of Conservation by the World Heritage Committee

The state of conservation of the property was first examined by the World Heritage Committee at its 33rd session (Seville, 2009), followed by its 35th session (UNESCO, 2011), 38th session (Doha, 2014), 39th session (Bonn, 2015), 41st session (Krakow, 2017) and 43rd session (Baku, 2019). A joint World Heritage Centre/IUCN Reactive Monitoring mission[1] was undertaken in March 2016 to review the state of conservation of the property, and the potential impacts of the thermal power plant development and dredging of Pashur River, upon the request by the Committee through its Decision **39 COM 7B.8**. The 2016 mission made nine recommendations, notably on freshwater inflow management, power plant construction in Khulna, integrated management system including a SEA, expansion of the Mongla Port and increase in shipping and dredging, development of a contingency plan for shipping incidents, poaching and climate change. The list of the 2016 mission recommendations is provided in Annex I. On the basis of Paragraph 180 of the *Operational Guidelines*, the World Heritage Centre and IUCN recommended that the Committee inscribe the property on the List of World Heritage in Danger at its 41st and 43rd sessions respectively, while the Committee at its 43rd session decided to examine whether or not to inscribe the property on the List of World Heritage in Danger at its 44th session in 2020 (Decision **43 COM 7B.3**).

The following provides a summary of the recent main state of conservation issues, including the requests made by the World Heritage Committee and the recommendations made by the 2016 joint World Heritage Centre/IUCN Reactive Monitoring mission.

Ecological monitoring

In 2009, the Committee requested the State Party to develop a programme of ecological monitoring, also documenting the impact of climate change on the OUV of the property (Decision **33 COM 7B.12**). In 2011, the Committee noted the initiation of the Sundarbans Environmental and Livelihoods Security project that included support for ecological monitoring and documenting the impacts of climate change on the OUV of the property. The

[1] The 2016 joint WHC/IUCN Reacting Monitoring mission report https://whc.unesco.org/en/documents/148097/

Committee further noted that, in the absence of ecological monitoring data for the property, it was not possible to assess the status of its OUV, and requested the State Party to submit the results of the ecological monitoring programme to the World Heritage Centre for review (Decision **35 COM 7B.11**). Upon the requests by the Committee in 2014 and 2015 (Decisions **38 COM 7B.64** and **39 COM 7B.8**), information on ecological monitoring was provided by the State Party following the 2016 mission, which confirmed the mission's finding that sea level rise, salt intrusion and a reduction in freshwater flows are posing a threat to the Sundarbans ecosystem. The 2016 mission also took note of climate change as a growing threat and recommended that indicators to measure climate change impacts should be included in ecological monitoring for the property. In 2017, the Committee welcomed the information provided on ecological monitoring, while noting with concern that sea level rise, salt intrusion and reductions in freshwater flows are posing a threat to the Sundarbans' ecosystem and that the property is particularly vulnerable to impacts from these threats (Decision **41 COM 7B.25**). The Committee further took note of the mission's concerns about the likely environmental impacts of the Rampal power plant on the property arising from air and water pollution, a substantial increase in shipping and dredging, and additional removal of freshwater from an already increasingly saline environment and requested the State Party to ensure that these impacts are comprehensively assessed as part of the SEA and adequate technological measures are put in place to mitigate these impacts, in order to avoid damage to the OUV of the property.

Industrial/infrastructure developments and Strategic Environment Assessment

In 2013, the World Heritage Centre and IUCN received information about the construction of a coal fired power plant in Khulna (Rampal) and a widening of the Pashur River along 10 km around Mongla Port near the property to accommodate the transportation of coal to the plant. Following correspondence between the World Heritage Centre, IUCN and the State Party, the Committee at its 38th session noted with concern that the indirect impacts on the property of the construction of Rampal power plant appeared to have not been assessed. The Committee also noted with concern the reports of further infrastructure and industrial development downstream of the power plant, and plans for the construction of an additional coal fired power plant in the same location. The State Party was therefore requested to undertake a comprehensive SEA to ensure that cumulative impacts of developments in the Sundarbans are adequately assessed, including in relation to the OUV of the property (Decision **38 COM 7B.64**). In 2015, the Committee reiterated its request to the State Party to undertake a comprehensive SEA, also requesting that further details on the mitigation measures taken for the power plant project be provided, which should fully consider the findings of the SEA (Decision **39 COM 7B.8**). Based on the information available at the time of the mission, the 2016 mission recommended that the Rampal power plant is cancelled and relocated to a more suitable location, and further recommended that the development of the Orion power plant and any similar proposed development to be halted until an independent, comprehensive and scientifically sound EIA has been conducted. Following the mission, the State Party reported that a decision was made to carry out a SEA for the South-West region of Bangladesh, including the property, which would include an assessment of the indirect and cumulative impacts on the OUV arising from the proposed Rampal power plant and other developments in its vicinity. The State Party also informed of its decision not to approve the proposed Orion power plant and the second phase of the Rampal power plant. The Committee at its 41st session welcomed these decisions by the

State Party, and requested them to ensure that any large-scale industrial and/or infrastructure developments will not be allowed to proceed before the SEA has been completed, and to submit a copy of the SEA to the World Heritage Centre for review by IUCN. The Committee also welcomed the State Party's decision not to approve the Orion power plant and Phase II of the Rampal power plant (Decision **41 COM 7B.25**). In 2019, the World Heritage Centre and IUCN received information about industrial development in the Ecologically Critical Area (ECA), 10km buffer zone of the SRF, and construction of the Taltoli and Kolapara coal-based power plants on the Payra River, approximately 20 km from the eastern boundary of the property. Following a World Heritage Centre's letter sent to the State Party requesting information on the third-party information received, the State Party provided a response including a copy of an EIA for Taltoli power plant. The Committee in its 43rd session expressed concern that 154 industrial projects upstream of the property were in operation, and reiterated that the State Party implement the relevant recommendations of the SEA to all current and future projects and recalled the obligation of the State Party to submit to the World Heritage Centre, for review by IUCN, detailed information including EIAs for development projects (Decision **43 COM 7B.3**).

Dredging of Pashur River

In 2014, the Committee at its 38th session considered that increased navigation on the Pashur River and the required dredging are likely to have a significant adverse impact on the property's OUV, and requested the State Party to ensure that the EIA for the dredging activities include a specific assessment of potential impacts on OUV (Decision **38 COM 7B.64**). In 2015, the State Party reported that an EIA for the dredging of the Pashur River has been completed, however, the Committee noted that the EIA did not include a specific assessment of the potential impacts on the property's OUV, and requested the State Party to submit this to the World Heritage Centre (Decision **39 COM 7B.8**). The 2016 mission expressed its concern about the potential threats to the property from increasing shipping and required dredging posed by the planned expansion and increase in use of the Mongla Port. In 2017, the Committee reiterated its request to the State Party to undertake the EIA for any future dredging of the Pashur River to include an assessment of impacts of the property's OUV (Decision **41 COM 7B.25**). The Committee at its 43rd session appreciated the State Party's confirmation that any future dredging of the Pashur River will be subject to an EIA (Decision **43 COM 7B.3**).

National Oil and Chemical Spill Contingency Plan

Following an oil tanker accident in the SRF in December 2014 and based on the recommendations made by the subsequent joint United Nations Development Programme / Government of Bangladesh mission, the Committee at its 39th session requested the State Party to continue monitoring the effects of the December 2014 oil spill on the aquatic environment, and to take measures to prevent such accidents, drawing lessons learned so as to strengthen its oil spill preparedness and response capacity (Decision **39 COM 7B.8**). The 2016 mission recommended the State Party to develop an effective action plan and emergency response facility to react to any future shipping incidents in a timely and coordinated manner. Following the mission, the State Party reported that measures have been taken to increase preparedness and response capacity in case of an oil spill, including the development of a draft "National Oil and Chemical Spill Contingency Plan" (NOSCOP).

In 2017, the Committee at its 41st session welcomed the progress made, and requested the State Party to ensure adequate provision of funding and human resources for the implementation, to provide further information and data on the monitoring of long-term impacts from recent shipping incidents, and to put in place a management system for shipping to minimize negative impacts on the property (Decision **41 COM 7B.25**). In 2019, the Committee regretted that the NOSCOP had still not been finalized, and also reiterated 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 (Decision **43 COM 7B.3**).

Transboundary cooperation

In view of a significant threat to the property resulting from higher salinity, the 2016 mission recommended, as a matter of utmost urgency and without delay, that the Ganges Treaty between India and Bangladesh is fully implemented in a coordinated effort to ensure adequate freshwater flow, and that a comprehensive, multilateral and integrated freshwater inflow management plan is designed and implemented, accompanied by necessary monitoring. In March 2017, the States Parties of Bangladesh and India met at the World Heritage Centre and expressed their intention to reinforce transboundary cooperation to protect the World Heritage properties of “The Sundarbans” (Bangladesh) and “Sundarbans National Park” (India). Subsequently, the Committee took note of the critical importance of transboundary cooperation between the two States Parties of Bangladesh and India on the World Heritage properties, and welcomed the efforts made by both States Parties to enhance collaboration (Decision **41 COM 7B.25**). The Committee further welcomed the formation of an India-Bangladesh Joint Working Group (JWG) of the Sundarbans and requested the State Party of Bangladesh to keep WHC 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 OUV (Decision **43 COM 7B.3**).

Management activities

The 2016 mission recommended the State Party to ensure sufficient financial and human resources for the long-term management and patrolling of the area and resource extraction including control of illegal activities such as poaching of wildlife and non-compliance with existing regulations. The Committee at its 43rd session welcomed 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, expansion of the three wildlife sanctuaries and the adoption of the Bangladesh Delta Plan 2100 to protect and expand the Sundarbans (Decision **43 COM 7B.3**).

1.5 Justification for the mission

The World Heritage Committee in its Decision **43 COM 7B.3** requested the State Party to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission to the World Heritage property ‘The Sundarbans’ and recommended that this mission takes place by the end of 2019 (Decision **43 COM 7B.3**). The World Heritage Centre and IUCN undertook the mission

from 9 to 17 December 2019. The mission was tasked to assess the following specific issues:

1. Assess the status and planning of any industrial and/or infrastructure developments, including the Rampal, Taltoli and Kolapara power plant projects, and the impacts of these projects on the OUV of the property;
2. Assess the status and planning of any dredging of the Pashur River and any rivers within the property;
3. Evaluate the progress achieved by the State Party in the undertaking of the SEA for the South-West region of Bangladesh, including the property, requested by the World Heritage Committee in its Decision **41 COM 7B.25**, review the Terms of Reference of the SEA and assess if the necessary measures were taken so that the SEA is conducted in accordance with international standards and best practice, and provide any necessary technical advice to the State Party in this regard, including on how the SEA results could be translated into concrete policy actions;
4. Review the progress towards finalizing the NOSCOP, and in ensuring adequate provision of funding and human resources for the implementation of the Plan;
5. Assess progress with the implementation of the 2016 Reactive Monitoring mission recommendations, adopted by the Committee in its Decision **41 COM 7B.25**;
6. In line with Paragraph 173 of the *Operational Guidelines*, assess any other relevant issues that may negatively affect the OUV of the property, including its conditions of integrity and protection and management.

The mission was comprised of Mr Guy Broucke and Ms Akane Nakamura representing the UNESCO World Heritage Centre, and Ms Elena Osipova and Dr Andrew Wyatt representing IUCN. A copy of the terms of reference of the mission and Committee Decisions **43 COM 7B.3** and **41 COM 7B.25** are provided in Annexes II and III, respectively. In advance of the mission, the State Party submitted an updated state of conservation report of the property to the World Heritage Centre/IUCN for review.

During the visit to Bangladesh, the mission met with key Ministries and their representatives; Mongla Port Authorities; regional and local authorities; industry representatives; representatives of local communities, NGOs and civil society; stakeholders of the SEA; and the representative of the IUCN Bangladesh Office. The mission undertook a 3-day field visit to the SRF including parts of the SEWS and SSWS by boat and on foot. The field visit was accompanied by representatives of key Ministries and site managers, who provided the mission team with detailed information and on-the-ground perspectives on the state of conservation of the property. A series of presentations by the site managers and relevant documentation were also provided during the boat trip. The boat trip started from Mongla Port and travelled through Pashur and Sela Rivers, including some of the Dolphin Hotspots, and smaller channels while making site visits at Katka, Jmtala and Kokilmoni in SEWS, Nilkomol (Hiron Point) and Keorashuti in SSWS and Harbaria in SRF. The mission also observed river traffic of industrial vessels and tourist boats on Pashur River including at Akram Point and Mazhar Point (Harbaria) where mother vessels transfer cargos to smaller vessels. Following the field visit to the SRF, a meeting with representatives of the Bangladesh India Friendship Power Company Ltd (BIFPCL) together with other stakeholders including local authorities and representatives of local communities and NGOs

was held at the site of the Rampal power plant, along with a visit to its construction site (Figure 1).

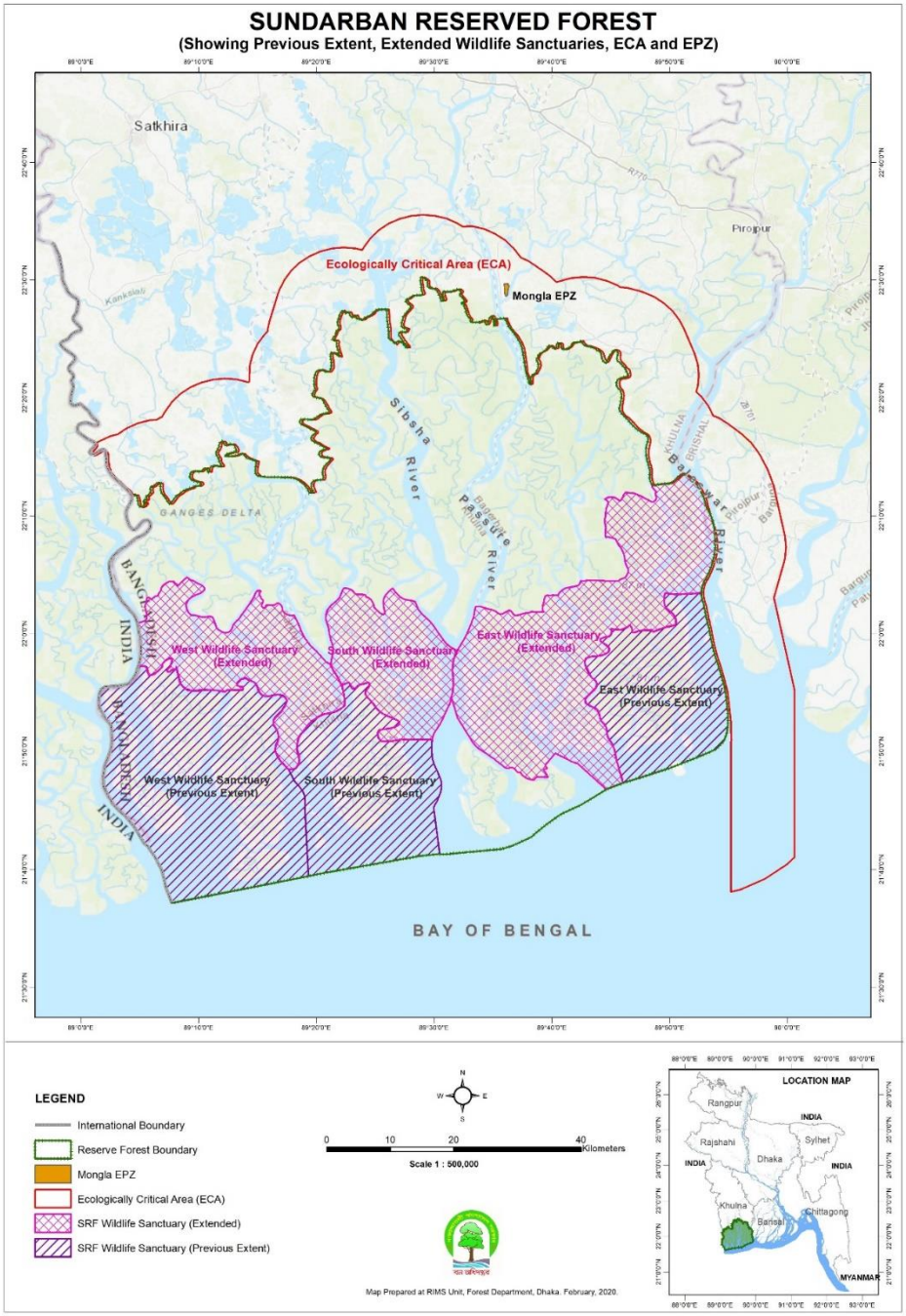


Figure 1: Map of the property showing location of the SRF including three components of the property (SWWS, SSWS and SEWS) and extended Wildlife Sanctuaries, ECA and their boundaries (Source: State Party)

Following the field visit to the SRF and the Rampal power plant, the mission had several meetings in Dhaka including with members of the National Committee for Saving the Sundarbans together with government officials; with the Center for Environmental and Geographic Information Services (CEGIS), a consulting company selected to conduct an SEA of the south-west region of Bangladesh; and with the JWG. A full programme of the mission and a list of people met during the mission is included in Annexes V and VI of this

report. Following the mission, the mission team requested additional information and clarification from the State Party, which were provided on 30 December 2019 and 13 May 2020 respectively.

2. NATIONAL POLICY FOR THE PRESERVATION AND MANAGEMENT OF THE WORLD HERITAGE PROPERTY

2.1 Protected area/national legislation

The three wildlife sanctuaries that make up the property were established in 1977 under the Bangladesh Wild Life Preservation Order 1973 amended by Bangladesh Wild Life (Preservation) Amendment Act 1974, having first been gazetted as forest reserves in 1878.

In 1999, a 10 km boundary around the periphery of the SRF was declared an Ecologically Critical Area (ECA) under section 5 of the Conservation Act 1995.

The Bangladesh Constitution was amended in 2011 to include a constitutional directive to the State to protect the environment and natural resources.

The State Party reports that in 2017, the total area of the three wildlife sanctuaries making up the property was extended from 139,700 ha to 317,950 ha. The property boundaries remain unchanged.

Additional laws and regulations relevant to the management of the property include:

- *The Wildlife (Conservation and Security) Act 2012, replacing the Bangladesh Wild Life (Preservation) Order, 1973*
- *Forest Act 1927*
- *The Bangladesh Environment Conservation Act 1995*
- *The Bangladesh Environment Conservation (Amendment) Act 2010*
- *The Bangladesh Biodiversity Act 2017*
- *The Bangladesh Water Act 2013*
- *The Bangladesh Environment Court Act 2010*
- *The Environment Conservation Rules 1997*
- *Protection and Conservation of Fish Rules 1985*
- *Marine Fisheries Rules 1983*
- *Marine Environment Conservation Act 2004*
- *Ports Act 1908*
- *Mongla Port Authority Ordinance 1976*

2.2 Institutional framework and management structure

The Ministry of Environment and Forests and Climate Change (MoEFCC) is comprised of two departments: the Bangladesh Forest Department (BFD) and the Department of Environment (DoE).

The responsibility for the management of forested areas in Bangladesh lies with the BFD, which is responsible for the field-level presence within the SRF and the property to patrol and monitor the site.

The DoE was established under the Bangladesh Environment Conservation Act 1995 to implement the Act, and its mandate includes approval of EIAs and mitigation of environmental degradation and pollution.

The property is managed by the BFD through the Chief Conservator of Forests, Conservator of Forests Khulna Circle and staff, who report to the BFD. The Conservator of Forests, Khulna Circle appears to hold primary responsibility for implementation of the Management Plan for the property, along with other key responsibilities for the day-to-day management including tourism and staff management through the Sundarbans East and West Forest Divisions, the stations and field camps.

The Mongla Port Authority is responsible for the maintenance of the navigational routes, which includes the Pashur River and any other adjacent navigational routes. Any dredging of the Pashur River is additionally managed by the Mongla Port Authority, which also assists with and provides input to the development of contingency plans for any accidents involving vessels on the Pashur River.

There is currently no integrated management system in place that comprehensively addresses all threats to the property.

2.3 Other relevant designations and programmes

The SRF, covering an area of 601,700 ha, was designated a Ramsar Site in 1992[2].

In January 2012, three marine dolphin sanctuaries were gazetted (IUCN Cat. II) in the eastern SRF (Dhangmari, Chandpai and Dudhmukhi) covering 31.4 km of channels over 1070 ha, in order to protect two freshwater dolphin species, the Irrawaddy and Ganges River dolphins.

In October 2014, Bangladesh established its first marine protected area – *the Swatch of No Ground Marine Protected Area* – located in the Bay of Bengal and 45 km off the coast of the SRF and the southern boundary of the property, primarily for the protection of cetaceans. The area, which includes the deep Swatch-of-No-Ground submarine canyon and its adjacent coastal waters, is an important breeding and spawning ground for several key cetaceans and fish, as well as other marine species, including a number of species for which the property was inscribed.

3. IDENTIFICATION AND ASSESSMENT OF ISSUES / THREATS

The mission had an opportunity to discuss a number of conservation issues, previously noted by the World Heritage Committee in its Decisions, including industrial development

[2] https://rsis.ramsar.org/ris/560

in the surroundings of the property in general and the Rampal power plant specifically, water transport and associated dredging and other maintenance activities; accidents management and contingency plans, and finally the SEA. The sections below present the key observations and conclusions of the mission on each topic.

3.1 Industrial development

The term 'industry' in Bangladesh is defined in the 1997 Environmental Conservation Rules (ECR), and can include small-scale projects, such as a small shed for making handmade bamboo and cane products which are classified as Green Category industry, all the way to large-scale power plants which are categorized as Red Category industry. The mission recalls that the potential impacts of developments in the vicinity of the Sundarbans on the OUV of the property, including cumulative impacts of multiple developments, has been of considerable concern to the Committee in recent years. The mission recalls Decision **41 COM 7B.25**, in which the Committee requested the State Party to "ensure that any large-scale industrial and/or infrastructure developments will not be allowed to proceed before the SEA has been completed". Under the 1997 ECR, industrial activity is categorised on a 4 step scale from least environmental impact (Green), through two medium impact categories (Orange-A and Orange-B), ending with the highest environmental impact category (Red). A detailed definition of what constitutes industry under these 4 scales is found in Annex-I: Industrial Categories under Environmental Conservation Rules, 1997. The following chapter outlines the current situation of key developments, both existing and planned, in the context of the property and its OUV.

3.1.1 Industry within the ECA

The mission has been reassured that the State Party has not licensed any new large scale (Red category) enterprises within the ECA (10 km buffer zone) of the SRF since the World Heritage Committee adopted its Decision **41 COM 7B.25** in 2017. This decision not to licence any new industrial enterprises in the ECA was further reinforced by a High Court order in 2017 in response to 'Writ Petition No. 12467/2017' by the Save the Sundarbans Foundation which requested a halt to all industrial enterprises within the ECA.

Regarding the status of existing industry within the ECA, the DoE reported the existence of 154 licenced enterprises within the ECA. Of these 154 enterprises, 130 are recorded as orange category (48 Orange-A and 82 Orange-B) and 24 as red category. The locations of the enterprises are provided in Figure 2.

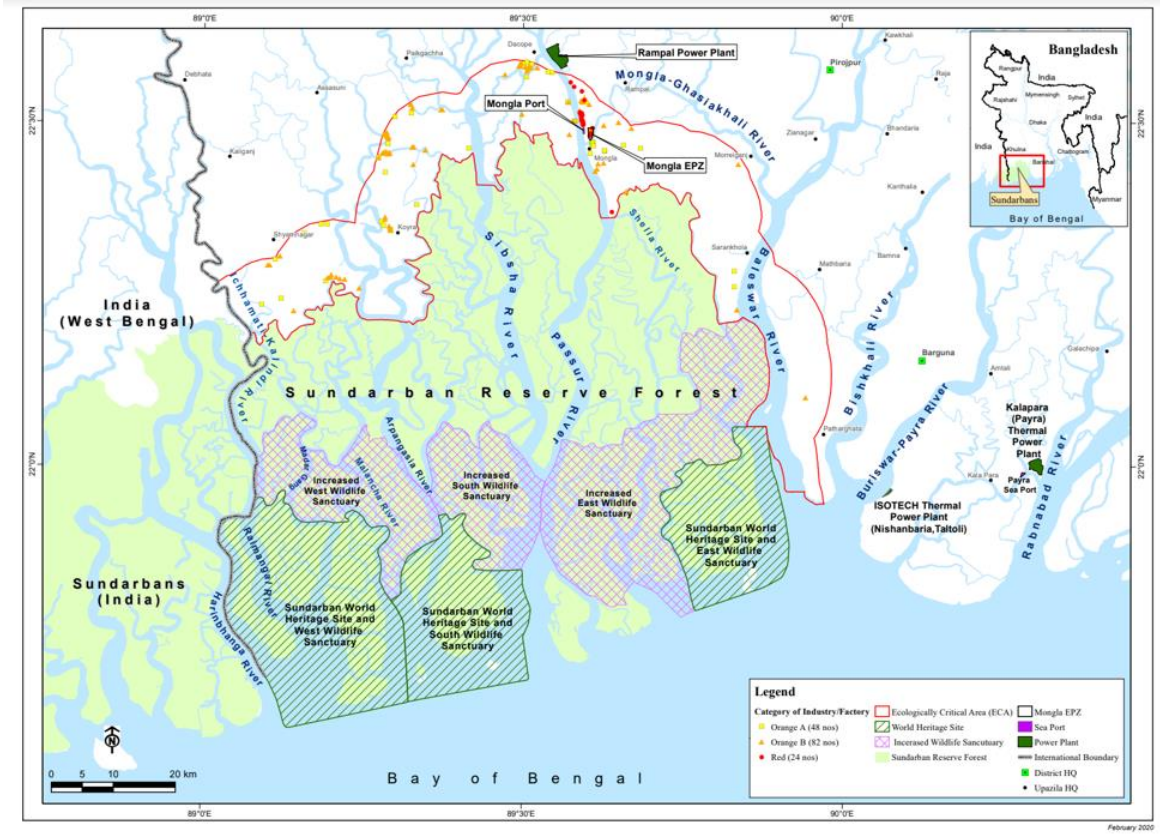


Figure 2: Map of the property showing location of industries (Source: State Party)

The 130 orange category enterprises located within the ECA include a diverse range of activities with low to medium impact. They include agricultural based facilities (Orange-A) such as rice processing facilities, fish, crab and poultry farms, sawmills, ice factories, and edible oil mills. The Orange-B facilities include non agro-based enterprises such as workshops, water treatment plants, hotels, small to medium scale factories, and a CNG filling station.

The 24 red category enterprises were all licenced between 1990 and 2014 and are largely, though not entirely, confined to the Mongla Economic Processing Zone (EPZ) (Figure 3) and the Mongla Port Industrial Area (Figure 4). Five of the red category enterprises are located outside of the Mongla Port Industrial Area and EPZ along the Pashur River. Of the 24 licenced enterprises, 4 have ceased operations, i.e. 2 shipyards and 2 petroleum storage facilities. The operational enterprises consist of cement mills, LPG bottling plants, a petroleum refinery, a jetty and a range of factories and assembly plants.

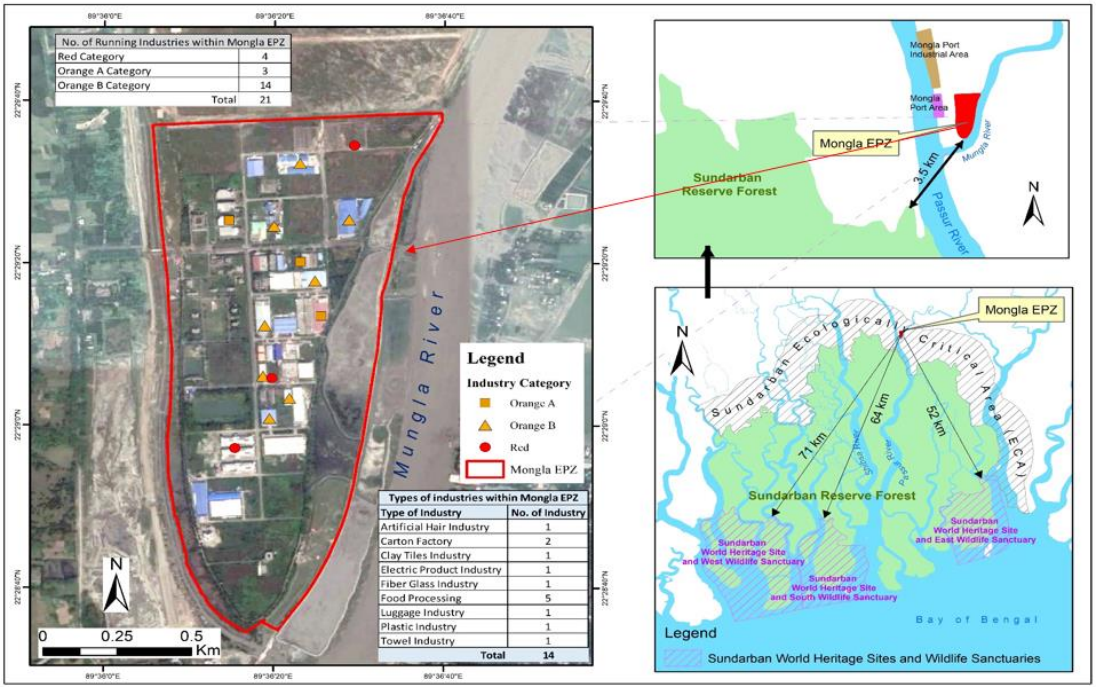


Figure 3: Red category industry in the Mongla Economic Processing Zone and distances from the property (Source: State Party)

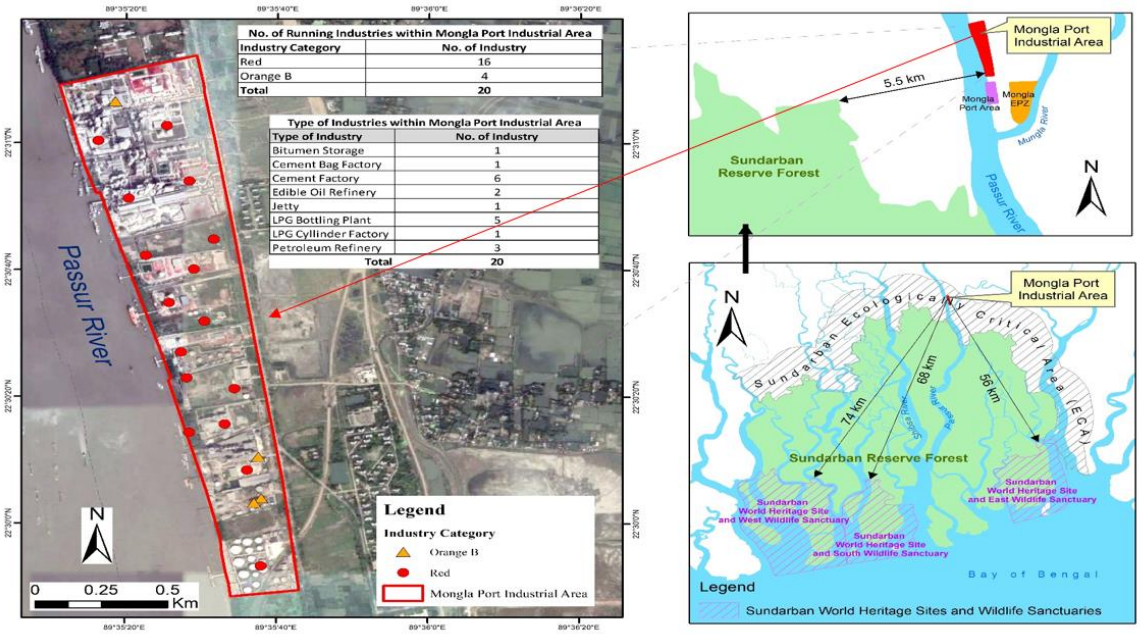


Figure 4: Red category industry in the Mongla Port Industrial Area and distances from the property (Source: State Party)

The mission is reassured that the DoE is monitoring the environmental impact of industrial activity within the ECA. In 2019, six cement factories in Mongla Port Industrial Area were fined BDT 5.00 million (about USD 59,000) for exceeding the limit of Suspended Particulate Matter (SPM) set in the Environmental Conservation Rules of 1997. Monitoring activity includes a water quality monitoring programme to monitor long term pollution trends in the Pashur River, and those environmental monitoring reports are available on the BIFPCL's

website[3]. At the time of the mission, dry season water quality data for the period 2010 to 2018 was presented showing little change in pH (measure of acidity), DO (Dissolved Oxygen), and BoD (Biological Oxygen Demand) in the Pashur River. Follow up documentation provided monthly data for both wet and dry season for the full range of parameters (pH, DO, BoD, TDS (Total Dissolved Solid), EC (Electrical Conductivity), SS (Suspended Solids) and Chloride, alkalinity, turbidity and salinity) for the period 2010 to 2018. Airborne SPM is also being monitored by DoE at cement factories in the Mongla Port Industrial Area.

The mission was informed by the State Party that it does not plan to revoke the licences of the remaining 20 operational red category enterprises within the ECA that were licenced prior to Decision **41 COM 7B.25** in 2016 and the High Court Decision in 2017.

3.1.2 Power plant construction surrounding the Sundarbans Reserved Forest

The mission was tasked to assess the status and planning of power plants located at Rampal, Taltoli and Kolapara and their potential impacts on the OUV of the property.

The mission was informed by the State Party that there are a total of 9 power plants in the Southern Region of Bangladesh (Figure 5). Of these 9 projects, 6 projects are located in 3 locations surrounding the Sundarbans. One other, the 350 MW Taltoli (Barrisal), is not included in the list of projects but is located near the Sundarbans.

SI.NO.	Name of Power Plant	Capacity (MW)	Net Capacity (MW)	Investment (MUS$)	Fuel Type	Ownership	Expected Commissioning Date	Remarks
1)	Modumoti, Bagerhat 100 MW PP	105	105	105	HFO	NWPGCL	March, 2019	Under Commercial Operation
2)	Payra, Potuakhali 1320 Coal Fired Power Plant (1st Phase)	1320	1244	3009.6	I. Coal	BCPCL (NWPGCL)	January, 2020	Progress 91%
3)	Khulna 330 MW CCPP (D/F)	336	326	268.8	Gas/HSD	BPDB	SC: June 2021 ST: December, 2021	Progress 20%
4)	BIFPCL, Rampal Coal Fired Power Plant	1320	1240	3009.6	I. Coal	BIFPCL	September, 2021	Progress 46%
5)	Payra, Potuakhali 1320 Coal Firer Power Plant (2nd Phase)	1320	1244	3009.6	I. Coal	BCPCL (NWPGCL)	December, 2023	Preliminary Works Ongoing
6)	Payra, Potuakhali 1320 Coal Fired Power Plant (Phase-1)	1320	1247	3009.6	I. Coal	RPCL	December, 2023	Preliminary Works Ongoing
7)	Rupsa 800 MW CCPP	800	800	560	LNG	NWPGCL	June, 2024	Preliminary Works Ongoing
8)	Payra 1200 MW LNG based CCPP (1st Phase)	1200	1164	840	LNG	NWPGCL	December, 2024	JDA Signed between Siemens & NWPGCL
9)	Payra 1200 MW LNG based CCPP (2nd Phase)	1200	1164	840	LNG	NWPGCL	December, 2027	JDA Signed between Siemens & NWPGCL

Figure 5: Operational and planned power plants in Southern Bangladesh (Source: State Party)

All 7 of the power plant projects are located in 3 locations outside of the ECA at varying distances of between 4 km (Rampal), 9.22 km (Taltoli), and 46 km (Kolapara – 3 coal-fired and 2 LNG power plants) from the boundaries of the ECA.

The driver of these energy developments in Southern Bangladesh is Bangladesh's Vision 2021 and Vision 2041 which aims to provide reliable electricity across Bangladesh at an affordable cost in order to move Bangladesh to a middle-income country by 2021 and a

[3]https://www.bifpcl.com/docstoreX.aspx?section=glMy8JBncK83sAfqRdXRCw%3d%3d&doctype=OUqnMt7UyD5aH0%2brGyi6EA%3d%3d

developed country by 2041. The dominance of the coal-fired power projects in Southern Bangladesh is argued by the State Party to be based on an assessment of fuel options for Bangladesh where coal is the least cost option for base-load electricity generation and where natural gas supplies are dwindling (Figure 6).

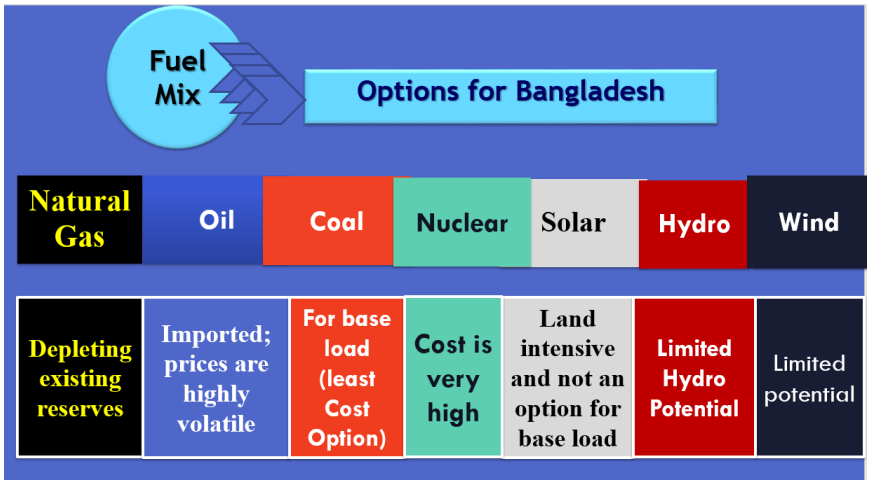


Figure 6. Fuel options for power generation in Bangladesh (Source: State Party)

3.1.2.1 Rampal (Maitree) power plant

With regards to this project, it should be noted that this mission report focuses mainly on the additional information provided by the State Party and the changes in the project design occurred since the last mission, as a comprehensive assessment of the project had already been provided in the 2016 Reactive Monitoring mission report. Therefore, the specific recommendations related to this project provided below mainly focus on several new aspects discussed during the mission. Overall, the 2019 mission re-affirms that in the absence of a comprehensive assessment of cumulative impacts from the ongoing and proposed large-scale industrial developments, concerns remain regarding their possible negative impacts on the property.

The 1320 MW Rampal power plant is being constructed by a Joint Venture between the Bangladesh Power Development Company Ltd (BPDP) and the National Thermal Power Corporation (NTPC) of India. The joint venture company is the Bangladesh-India Friendship Power Company Ltd. (BIFPCL). The Rampal power plant is officially called the Maitree Super Thermal Power Project.

The mission appreciates the further information and clarifications provided by the State Party in response to the concerns raised over the construction of the Rampal power plant in previous communications and the opportunity to visit the site of the power plant. Concerns raised during the joint World Heritage Centre/IUCN Reactive Monitoring mission in 2016 included air pollution from coal ash, pollution from wastewater and waste ash, increased shipping, shipping accidents and dredging and the cumulative impact of industrial and related development infrastructure.

The following information was received during the mission and in follow up communications:

The environmental clearance of the Rampal power plant included the completion of an initial environmental examination (IEE) study in September 2010, public hearings in April 2013, completion of EIA study in July 2013, approval of the EIA by DoE in August 2013, approval of the EIA for the dredging of the Pashur River in November 2015, and approval of the EIA for coal transportation through the Pashur River in January 2018.

As of May 2020, construction is 46% completed and the planned commissioning date is set for September 2021. The mission recalls that the Committee has been requesting the State Party not to proceed with the project until the SEA has been completed, and therefore this continuation of construction activities against Committee Decisions, is deeply concerning.

The Rampal power plant is located on 370 ha of land to the north of Mongla Port and 4 km outside of the ECA on the east bank of the Pashur River. As such, the site is located 14 km from the nearest boundary of the SRF and 65 km from the nearest boundary of the property (Figure 7).

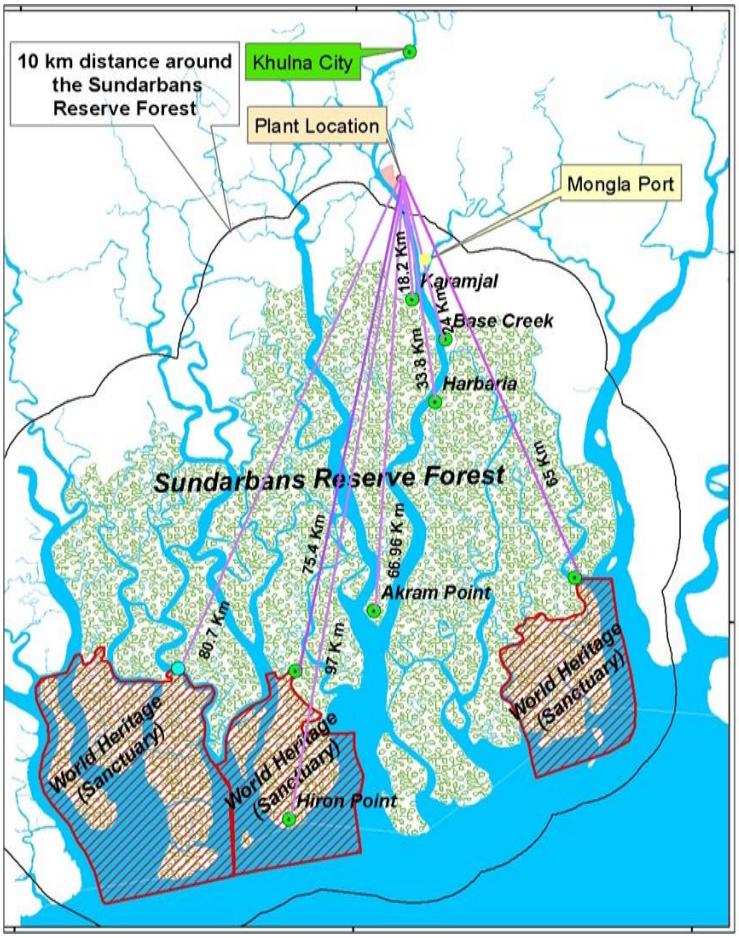


Figure 7. Location of the Rampal Power Plant and distance from the property (Source: State Party)

The Rampal power plant, with a total capacity of 1320 MW (2 X 660 MW plants), is being built using Ultra Super Critical Technology (USCT), a technology that has been used in or near dense urban environments in Japan, Taiwan, Germany and other countries. The State

Party is committing to USCT for all new large-scale coal fired power plants in Bangladesh. The following pollution control measures are being committed to:

- 275 m high Chimney
- Electro Static Precipitator (ESP) for controlling fly ash
- Flue Gas Desulphurization (FGD) for controlling SOx
- Wet type FGD to strip off the maximum parts of Hg
- Low NOx Burner for controlling NOx
- Fugitive Dust Control within and outside of the plant
- Ash Management
- Closed Cycle Cooling Water System
- Central Effluent Treatment Plant (ETP)
- Sewage Treatment Plant onsite (STP)

Fichtner, a German engineering management consultant, is employed by BIFPCL as the onsite quality assurance engineer. The mission was able to observe the presence of on-site Fichtner engineers during the mission's visit to Rampal power plant.

Concerns raised during the previous mission in 2016 over air borne emissions and water pollution from the Rampal power plant polluting the Sundarbans were discussed during the 2019 mission. CEGIS analysis of prevailing wind conditions over the Sundarbans suggest that for 8 months of the year, emissions would be taken to the north of the plant in the direction of Khulna City. And for 4 months in the year, prevailing winds would take emissions to the south and south east into the Sundarbans (Figure 8). While there is no data available on the level of SO_2, NO_X and mercury emissions from the power plant until it begins operation, the mission was informed that significant mitigation technologies have been introduced at additional cost to minimise these emissions. These technologies are reportedly the industry best available technology, including aforementioned Flue Gas Desulphurization (FGD) for removing SO_X, Wet type FGD to control mercury emissions, and Low NO_X Burner for controlling NO_X. According to the EIA, the DoE monitors to ensure compliance with the standards for these emissions outlined in the Environmental Conservation Rules 1997. These additional mitigation measures adopted are higher standard than what was modelled in the EIA.

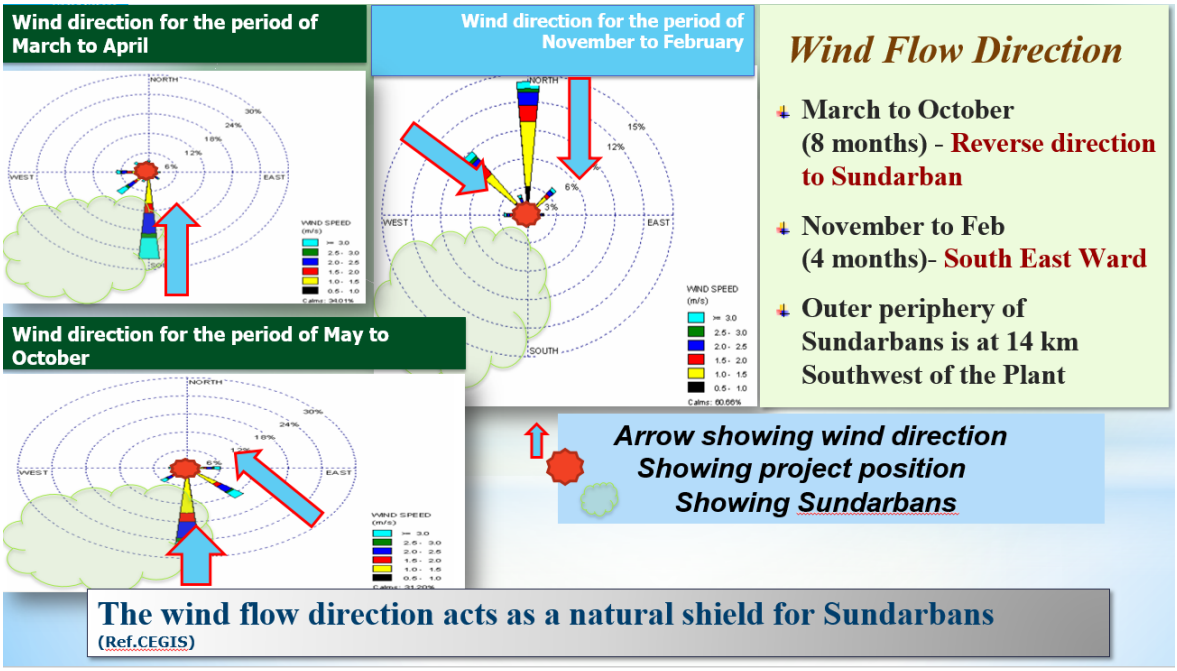


Figure 8: Prevailing year round winds at Rampal (Source: State Party)

As for the water abstraction and pollution, the 2019 mission was informed by the State Party of a set of mitigation measures adopted, notably the installation of the Closed Cycle Cooling Water System to reduce water abstraction, and the introduction of Central Effluent Treatment Plant and Sewage Treatment Plant as well as Fugitive Dust Control within and outside of the plants to mitigate water pollution.

An Environmental Management Plan (EMP) is in place and is being implemented by CEGIS. The EMP sets measures for mitigation, compensation and contingency during the three phases of pre-construction, construction and post-construction/operation. Reports are submitted to Bagerhat, Khulna and Dhaka DoE offices. The EMP includes:

- Monthly Environmental reports on conditions within the plant site;
- Quarterly environmental monitoring reports on conditions in and around the plant site (from Khulna to Hiron point), which are made available at BIFPCL's website;
- Monthly EMP compliance reports.

One of the major potential indirect impact of the power plant on the OUV of the property relates to the coal transportation and trans-shipments through and along the Pashur River in order to supply coal to the Rampal power plant. This issue has been assessed within the Coal Transportation EIA (CT-EIA)[4], dated November 2017, for both the construction phase and operational phase of the project. The potential impacts of these phases before mitigation measures are implemented are rated as "Moderate-Adverse". Furthermore, the mission was informed that the risk of coal spillage from shipping and trans-shipments in the Pashur River will be mitigated by using covered coal transport barges to control wind-blown

[4] Available on the BIFPCL's website (https://www.bifpcl.com/docstoreX.aspx?section=glMy8JBncK83sAfqRdXRCw%3d%3d&doctype=ntZMV%2b%2bcdqXHyl4qYIz5xQ%3d%3d)

and over-side spillage, In the view of the mission, while the proposed mitigation measures related to the shipping of coal appear comprehensive in principle, ensuring compliance with them might represent an operational challenge, as it will require coordination between different agencies. Therefore, it will be critical that the phases are closely monitored for compliance. The approval of the CT-EIA was issued by the DoE in January 2018 (Memo No: DoE/Clearance/5532/2016/50)[5] which contains 40 stipulations.

The transportation route (Figure 9), regulated by the Mongla Port Authority (MPA), skirts the eastern boundary of the SSWS but crosses 2 existing dolphin sanctuaries (Chandpal and Dhangmari) and a proposed new sanctuary (Vodra) (Figure 10).

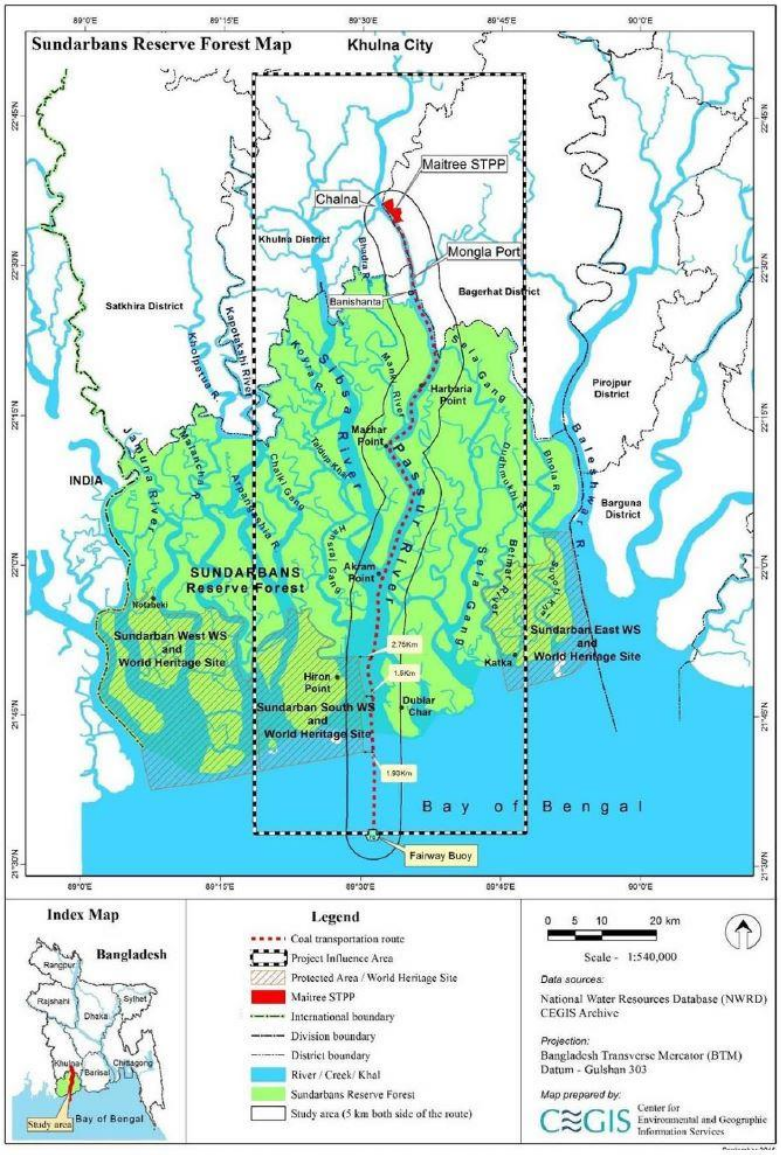


Figure 9: Coal transportation route (Source: State Party)

[5] Available on the BIFPCL's website (https://www.bifpcl.com/docstoreX.aspx?section=glMy8JBncK83sAfqRdXRCw%3d%3d&doctype=ntZMV%2b%2bcdqXHyl4qYIz5xQ%3d%3d)

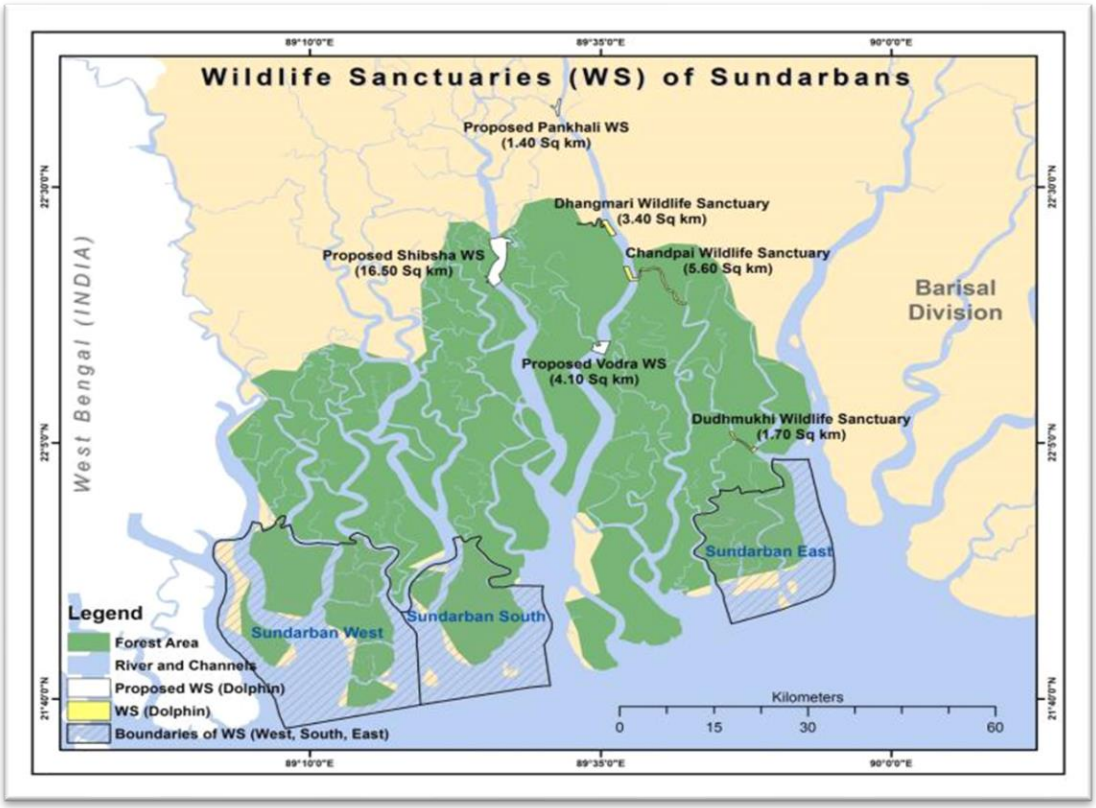


Figure 10. Location of the dolphin sanctuaries (Source: State Party)

Specific mitigation measures contained in the CT-EIA and project EMP related to the OUV of the property, which if complied with are projected to reduce the impact to 'Minimal', include:

Mitigation of shipping impacts on the World Heritage site

- The MPA regulated transportation route past the Sundarbans South WH component will skirt the boundary in the middle of the Passur River by 1.5 to 2.75 km.
- Shipping vessel would follow the MPA and applicable International Maritime Organization (IMO) conventions when transporting coal including the use of covered coal ships and barges.
- Monitor and review of shipping impacts on a regular basis and work with stakeholders to help minimize impacts on protected areas.
- Periodic audits for the compliance of IMO regulation of coal vessels.

Pollution from and Risk of Marine Vessels due to Non-compliance

- Verify compliance documents of applicable marine pollution (MARPOL) and International Maritime Solid Bulk Cargoes Code (IMSBC) during cargo clearance from Mongla Port Authority.
- Verify documents indicating properties of coal, like GCV, moisture, ash, sulphur content etc.
- Monitor whether liquid residues of coal vessel discharge into the marine environment.

- Ensure dry residues and/or the wash water that contains residues from a harmful to the marine environment (HME) discharged at adequate port reception facilities of the MPA.

Impact of Noise on Surrounding Environment and Wildlife

The CT-EIA recognizes that above ground noise generated from vessels and trans-shipment may impact the surrounding environment and wildlife, including resident and migratory birds. A set of 12 noise level recorders have been established on the left and right banks of the Passur River to monitor noise levels along the transportation route from the project site to the offshore Fairway Buoy. Data from these recorders is used to determine the sound levels from different noise sources and to then model different noise level scenarios including a baseline. A detailed assessment of these scenarios is contained in section 9.8.7 of the CT-EIA. Based on this analysis the EIA has proposed the following mitigation measures:

- Coal being unloaded from barges will have minimal drop heights.
- Adhere to transhipper's environmental control measures recommended in the CT-EIA.
- Adherence to a comprehensive equipment maintenance program to maintain equipment, and to maximize efficiency and reliability, which will help limit noise levels associated with the operation.
- System components will be maintained to operate below maximum operating noise levels wherever feasible.
- Maintenance records will be maintained for review by BIFPCL.
- Noisy mobile equipment supporting the operation will be removed from service wherever practical and replaced with a less noisy alternative.
- Noise Management plan for ships/barges will be implemented.
- Restrict blowing of whistle within the Sundarbans territory.
- Switch off / throttle down of all equipment when not in use.
- For the life of the operation, BIFPCL will evaluate noise levels and onsite activities to identify opportunities for using less noisy equipment and / or making changes to day-to-day operations that may reduce overall noise levels.

The mission has noted and shared with the State Party recent science[6] on the impact of underwater noise pollution produced by river vessel traffic on the metabolic health of the Ganges River Dolphins in India. It is of concern that monitoring and assessment of this noise pollution in the Pashur River as river traffic increases is not considered in the CT-EIA or the SEA. In this regard, the mission makes the following recommendation:

Recommendation 1

Monitor underwater noise pollution (vessel noise) in or near dolphin habitats/sanctuaries created by increased river traffic from coal shipments in the Passur River and ensure that the issue of increasing noise pollution and its impacts on aquatic fauna is considered by the SEA.

[6] https://www.nature.com/articles/s41598-019-51664-1

In terms of the overall process and engagement of civil society, the mission notes that BIFPCL has expressed its commitment to public transparency. The company has a public website (www.bifpcl.com) where its environmental compliance documents including EIAs, monitoring reports, environmental compliance reports, etc. are made publicly available.

An 8 member Independent Monitoring Panel has been established to provide the State Party with advice on the construction and operation of the Rampal power plant. The 8 members of the panel includes one internationally based power sector expert, 2 retired government officials from DoE and BFD, one representative from CEGIS and 4 senior academics from universities in Bangladesh with expertise in civil engineering, chemical engineering, environmental science, and soil and water. While the panel carries the title of an independent panel, it may not be considered as truly independent by critical third parties given the composition of the panel members and that the panel reports to the Power Division of the Ministry of Energy. A brief ToR guides the work of the Panel members as follows:

1. The panel members will be invited in review meetings to share their views on the proper compliance and implementation of the project;
2. Views of the panel members will be sought through e-mail as and when necessary for the execution of the project as per EIA and other compliance guidelines;
3. The panel members are always welcome to provide their inputs in order to ensure the environment pollution mitigation measures;
4. The panel members may be invited to bilateral/multilateral meetings with the stakeholders to exchange their views in connection with the implementation of the project;
5. The panel may continue even during the operation of the plant.

The mission had an opportunity to meet with representatives of the civil society organizations and considers that engagement of the civil society in the processes related to the construction of the Rampal power plant should be further improved. Therefore, the mission makes the following recommendations:

Recommendation 2
Ensure greater use of the Independent Monitoring Panel, which was established to provide the State Party with advice on the construction and operation of the Rampal power plant, to address concerns from third parties over the construction of Rampal power plant.

Recommendation 3
Consider other functionally independent advisory panel processes, such as IUCN's Independent Scientific and Technical Advisory Panel (ISTAP)[7]*, as possible models to ensure greater transparency and public trust in the process, and to expand the scope of communication and engagement with third parties to include the state of conservation of the property in relation to other industrial and power plant developments, and the SEA.*

[7] https://www.iucn.org/theme/business-and-biodiversity/our-work/business-approaches-and-tools/independent-scientific-and-technical-advisory-panels

3.1.2.2 Taltoli (Barisal) power plant

The Taltoli power plant at Taltoli Upazila is officially referred to as the Barisal power plant. The project is being developed by the Barisal Electric Power Company Limited (BEPCL) largely within the premises of privately owned land belonging to the parent company, Iso Tech Electrification Company Limited[8], and partly on government (Khas) land in Taltoli Upazila under Barguna District of Barisal Division, Bangladesh.

The project is a 350 MW coal-fired power station at a cost of 629 million USD. Construction of the power plant began in 2018 and the planned commissioning date foreseen for January 2022. As mentioned above, the Committee in 2017 adopted the Decision **41 COM 7B.25**: "requests the State Party to ensure that any large-scale industrial and/or infrastructure developments will not be allowed to proceed before the SEA has been completed". As with the Rampal power plant therefore, it is of great concern that the Taltoli power plant is also continuing to be developed in spite of the clear Committee Decision. An additional 350 MW plant is further planned to be implemented in the future.

While the mission did not visit the site of the Barisal power plant, the following information has been extracted from the project EIA and EMP which was provided by the State Party in June 2019 in response to a request for information by the World Heritage Centre.

According to the project EIA, the project is committing to the use of the following pollution control measures including a super-critical boiler, low NOx burner, ESP, FGD, positive-pressure dense-phase pneumatic ash handling system for fly ash and air-cooled mechanical handling system for bottom ash, ETP, Oily Waste Water Treatment Plant, STP and a green belt of 1/3 of the project area to contain pollution levels within national and international standards.

The site of the Barisal power plant is located 19.22 km from the eastern boundary of the SEWS and 9.22 km from the boundary of the ECA (Figure 11). As such, its assessed ecological impact zone overlaps with the eastern tip of the SEWS (Figure 12).

[8] https://www.isotechgrp.com/ITECL.html

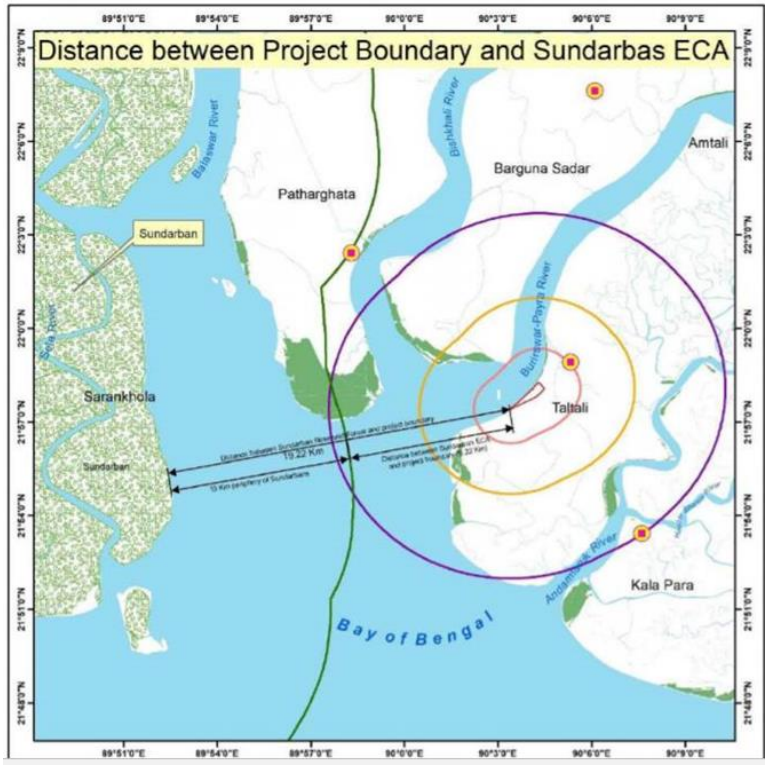


Figure 11. Distance between the Barisal power plant site and the boundaries of the property and of the ECA (Source: Project EIA)

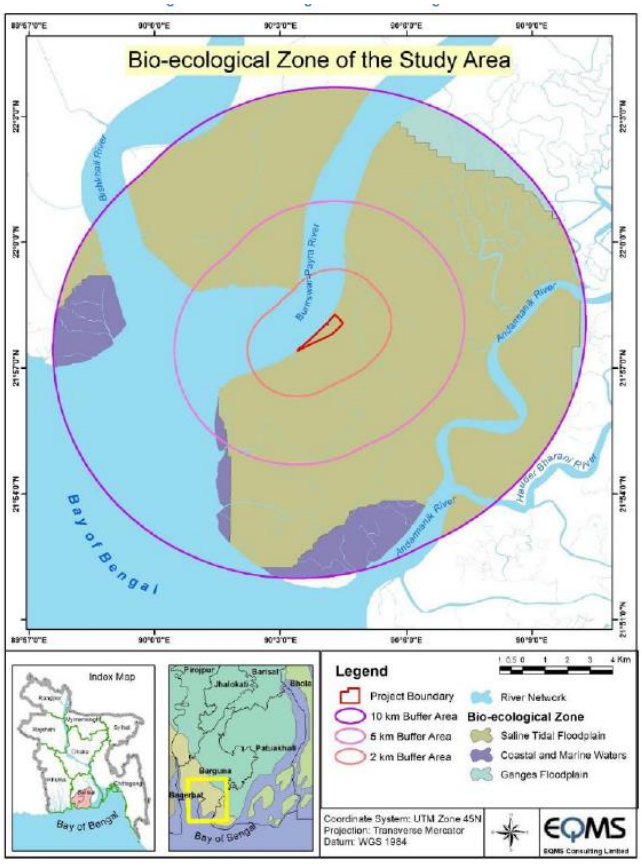


Figure 12. Ecological impact zone of the Barisal power plant (Source: Project EIA)

The EIA and EMP has put in place a pollution monitoring plan following DoE guidelines for the site including monitoring of particulate and gaseous emissions. Enforcement of the DoE emissions standards at the site is expected to ensure that the emissions that move beyond the site will be at lower levels than national standards. The prevailing wind direction at the site, which are predominantly on the north-south axis, is projected to minimise the possible movement of any emissions towards the SEWS (Figure 13).

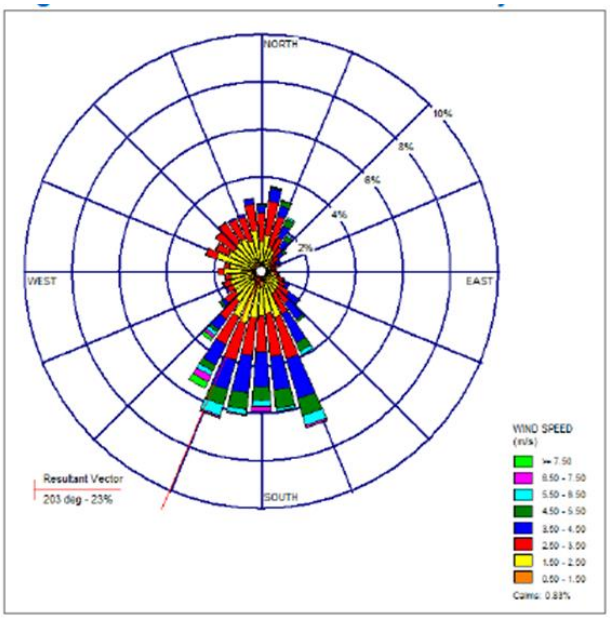


Figure 13. Prevailing wind directions (Source: Project EIA)

The impacts on the OUV of the property that are of greatest concern relate to the aquatic environment. The coastal areas and rivers surrounding the site are important dolphin and turtle habitats. Potential impacts on dolphins and turtles identified in the EIA include impacts from greater river traffic due to the increased sea transportation in the area from coal shipments and thermal pollution from cooling water discharge. With specific relevance to the OUV of the property, the EMP puts in place the following set of requirements for the developer to implement:

- A detailed study on the river dolphins in the Buriswar-Payra River with at least one year of monitoring data should be collected during the construction phase and another one year during operational phase of the project. Based on the results of the study the need and duration for continued monitoring will be assessed.

- All shipping and barging activities shall ensure zero waste dumping, zero ballast water dumping, zero pollution causing activities as per the IMO Conventions and national Environmental Regulations. DG Shipping, Bangladesh Inland Water Transport Authority (BIWTA), and the Coast Guard are tasked with regularly inspecting shipping and barging activities to enforce the relevant clauses of conventions and rules.

- In addition, the following measures are to be taken into account during shipping and barging activities and other project related activities during power plant operation:

1. Vessels must not approach closer than 300m to any dolphin;
2. Approach dolphins from behind and to the side;
3. Avoid the dolphins and turtles movement path during dredging in the sea;
4. Avoid dredging activities and movement of water vessels during surfacing, swimming time and season of Dolphin movement i.e. at dawn, evening and monsoon season;
5. Protect the egg, breeding period of juvenile turtles in the region;
6. No trapping and killing of Dolphin and turtle in the project site;
7. No waste water discharge from the power plant ETP and STP plant without treatment;
8. Raw water intake point in the Buriswar-Payra River for the proposed power plant must be covered by the net so that no aquatic fauna can be affected by the water intake structure;
9. Plan measures for accidental oil and chemical spillage from the power plant;
10. Anchorage of water vessel only in designated sites;
11. Throttle down vessel speed (less than 6 knots) if dolphins are seen in navigational route;
12. Keeping noise from vessels within the limit of ECR, 1997;
13. Ensure the temperature of the cooling water in an acceptable limit before discharge into the Buriswar-Payra River; and
14. Ensure zero waste dumping, ballast water, oily water dumping to the Buriswar-Payra River.

Recommendation 4
Submit the study on the river dolphins in the Buriswar-Payra River with respect to the Taltoli (Barisal) power plant development and its associated increased shipping activities, to the World Heritage Centre for review by IUCN when available, and ensure any findings of negative impacts are immediately addressed through the implementation of mitigation measures.

3.1.2.3 Kolapara (Payra) power plant

While the mission did not visit the site of the Kolapara power plant, the following information has been derived from documentation provided by the State Party in June 2019 in response to a request for information by the World Heritage Centre.

The Kolapara power plant, officially referred to as the Payra 1320 MW Thermal Power Plant (1st Phase), is the 1st phase of a complex of thermal power plants to be built at the same site in Patuakhali district, Kolapara Upazila. Plans for the complex include three 1320 MW coal-fired power plants and two 1200 MW LNG fueled power plants (Figure 5). The Payra power plant is at an advanced stage of construction with 99% of its physical construction complete[9].

[9] http://www.bcpcl.org.bd/

The Payra power plant is being built by the Bangladesh-China Power Company (Pvt) Limited, a Joint venture of North-West Power Generation Company Limited (an Enterprise of Bangladesh Power Development Board and CMC, China).

The power plant is reportedly utilizing Ultra Super-Critical technology[10] and is located on a 398 ha site in Patuakhali district of Kolapara Upazila beside the Rabonabad channel in Patuakhali district.

Out of the 3 sites, the Kolapara site is the furthest from the ECA and the second furthest behind the Taltoli site from the property. The power plant lies 42.75 km to the east of the ECA boundary and 39.53 km from the boundary of the SEWS (Figure 14).

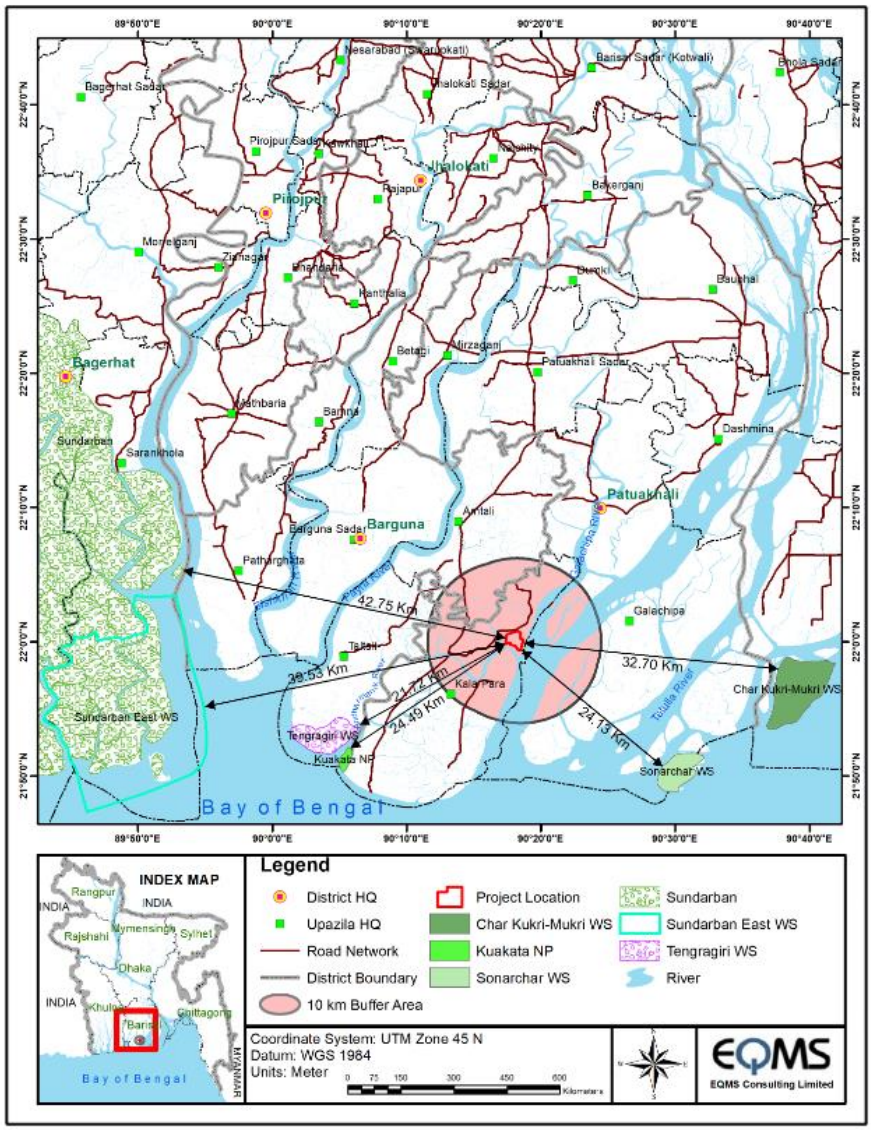


Figure 14. Site of the Payra power plant (Source: State Party)

Although the Kolapara site is located 39.53 km from the eastern boundary of the property and not on the Payra River, the site is recognised to be within the habitat area of the river

[10] http://www.bcpcl.org.bd/power-plant

dolphins, an important attribute of the OUV of the property that could be impacted by power plant construction and operations. As such, the project's EMP stipulates the development of a Dolphin Conservation Plan.

Recommendation 5
Before proceeding any further with the development of the Payra Thermal power plant (also known as Kolapara power plant), develop a Dolphin Conservation Plan to prevent any adverse effects on the river dolphins that are present within the project area, and submit the Plan to the World Heritage Centre for review by IUCN as soon as it is available.

3.2 Port, dredging and shipping

The Port of Mongla is the second busiest seaport of Bangladesh. It is located in Bagerhat District, 62 km north of the coastline. The main access route is through the Pashur River that borders the SSWS, the central of the three components of the property. Ocean cargo vessels transfer goods into smaller vessels in the estuary of the river, in close proximity to the property.

The mission was able to observe ongoing expansion and dredging operations near the port. Reports provided by the State Party during the mission show that the number of vessels has seen an accelerating increase from 139 in 2008/9 to 912 in 2018/19.

At the level of the property, the mission was able to confirm moderate but constant traffic on the Pashur River, consistent with the reported annual figures; mainly cargo vessels but also some tourism operators. The transfer of coal to the power plant is reported to require one daily draught coal carrier/barge (5,000 to 10,000T). Ship-to-ship transfer will be done by an (open) floating transfer vessel.

Further dredging is reported at the outer bar, situated across the river from the SSWS. The intensified use of Mongla Port will require regular maintenance dredging. The EIA for the outer bar dredging[11] recommended two disposal areas for the dredged materials, a deep off-shore location (shown as Disposal Location 4 in Figure 15) that is not in a protected area, and an area on the eastern bank of the estuary (shown as Disposal Location 2 in Figure 15). The mission was informed that this selection was confirmed by the Port Authority. The EIA states that this disposal will "enhance natural accretion trend in the area which is in line with a building with nature approach. Initiatives to grow mangroves in this area will increase the Sundarbans mangrove forest".

Although this area falls outside the property, the mission notes that conservation of natural processes remains preferable to engineered accretion. Reports indicate that dredging of 30M m^3 at Outer Bar (Length 20km, channel width 160m and design depth 12m) and 2.1M m^3 from Base Creek to Mongla Port Jetty (channel width 100m, length 16km and design depth 5.5m) have been suggested for effective coal transportation[12].

[11] Ministry of Shipping, Mongla Port Authority (2018). EIA of the Proposed Dredging Project at the Outer Bar area of Passur Channel
[12] Ministry of Power, Energy and Mineral Resources, Bangladesh Power Development Board (2012) Final report on consulting services on coal sourcing, transportation and handling of (2x660) MW coal based thermal power plants each at Chittagong and Khulna, and 8320 MW LNG and coal based at Maheshkhali.

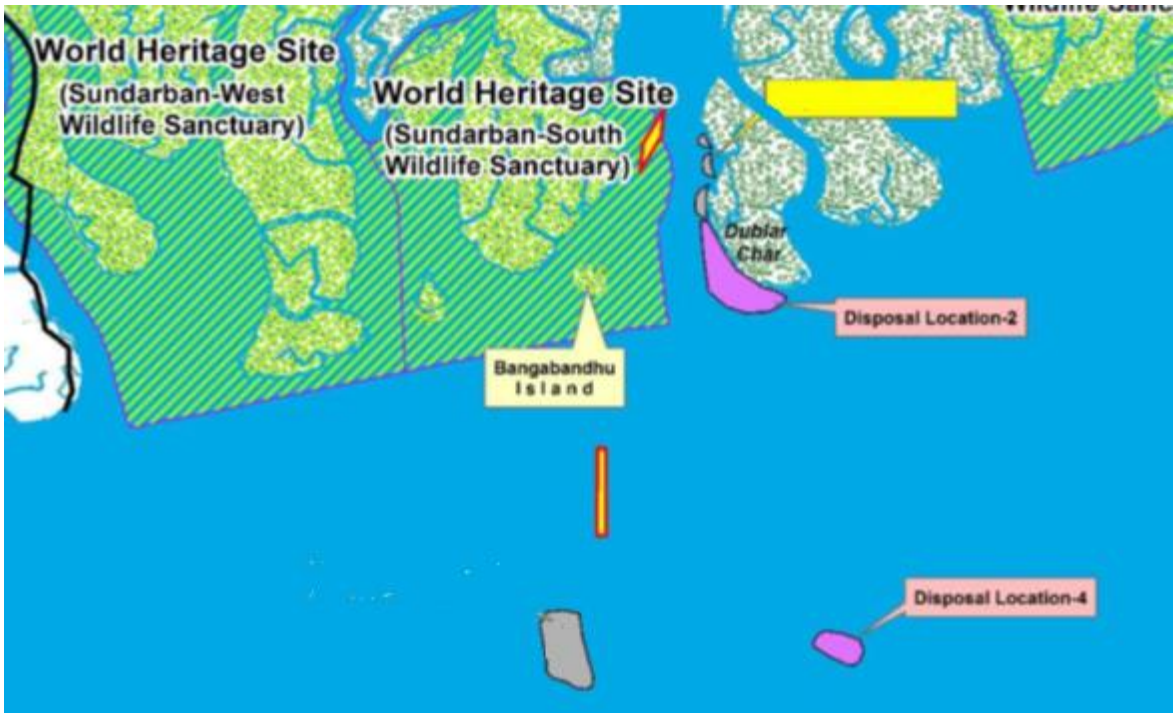


Figure 15. Selected disposal zones for dredging material (loc. 2 & 4)
(Source: EIA of the Proposed Dredging Project at the Outer Bar area of Passur Channel)

Reports show 1-2 annual shipping accidents registered as disasters in the Sundarbans, mainly involving coal and fertilizer shipping. It is likely that smaller incidents take place but are not recorded, including spillage from the open ship-to-ship transfer vessels. Disposal of waste from ships is prohibited but difficult to monitor. Particularly the large cargo vessels anchored in the estuary for several days or weeks are likely to dispose of some waste. Noise pollution is an additional impact that is proportional to the growing volume. Any shipping operations should follow the protocol outlined in the National Oil and Chemical Spill Contingency Plan (NOSCOP) as detailed in the following section.

On 18 February 2020, the National Economic Council (ECNEC) of Bangladesh, chaired by the Prime Minister, approved the proposal to enhance the capacity of Mongla Port through the construction of container terminals and facilities, and administrative and residential buildings. In addition to port infrastructure and marine access, other approved developments include road (Dhaka-Mongla Highway, Padma Bridge), air (international airport), and rail access (Mongla-Khulna and beyond to India and Nepal). The mission notes with concern the proposed new development in Mongla Port which is likely to increase traffic in the Pashur River.

Recommendation 6
Ensure that shipping and dredging are included as priority sectors in the scope of the SEA, including long-term and least-impact options regarding the continued use of the Pashur estuary as anchor and transfer area, proposed measures to minimize the river traffic and its impact, and options regarding disposal of major and minor dredged materials.

Recommendation 7

Until the SEA is completed, ensure that no further decision is made for any new large-scale industrial and/or infrastructure developments in the vicinity of the property, including further development of the Mongla Port and any other development that might further increase traffic on the Pashur River.

3.3 National Oil and Chemical Spill Contingency Plan (NOSCOP)

At the time of the mission, the final draft of the National Oil and Chemical Spill Contingency Plan (NOSCOP) was available in Bangla to be approved by the Cabinet Division of the government, while the English version was being finalized. The State Party subsequently submitted the final draft of the English version of the NOSCOP to the World Heritage Centre on 30 January 2020.

The final draft of the NOSCOP clearly addresses crisis management procedure and roles and responsibilities of respective Ministries and Departments of the Government of Bangladesh and other agencies concerned for oil and chemical spill response, including those of Financial Division of the Ministry of Finance to provide authorization for expenditure and funds for initial response (5.1.1.8.6). The NOSCOP also specifies procedures for evaluation of a spillage based on the Net Environmental Benefit Analysis in order to minimize the immediate damage to environment and socio-economic resources and to reduce the time for recovery (5.2.3), as well as mitigation of environmental impacts and ecosystem restoration in the long term (5.2.7) as requested by the Committee in its Decisions **41 COM 7B.25** and **43 COM 7B.3**.

While the Sundarbans is recognized as a priority area for protection in the NOSCOP, the World Heritage Convention is not included in the list of national and international policy considered by the Plan (Annex B of the NOSCOP). It is important that the NOSCOP duly recognizes the responsibility of the government, as a State Party to the World Heritage Convention, to protect the OUV of the property. It is also recommended that the State Party develops a local plan, as indicated in the clauses 5.1.2.2.4 and 5.1.2.2.5 of the NOSCOP, and put in place measures to prevent any oil and chemical spill incidents within and in proximity to the property in the first place, and to ensure immediate actions for mitigating impacts on the property in case of emergencies.

Recommendation 8
Clearly address the responsibility of the government to protect the OUV of the property in the National Oil and Chemical Spill Contingency Plan (NOSCOP), and develop an effective localized contingency plan covering the property in accordance with the national plan outlining measures to prevent any future oil and chemical spill incidents within and in proximity to the property and to ensure immediate and coordinated actions for mitigating impacts on the property in case of emergencies.

3.4 Strategic Environmental Assessment

As noted above, the World Heritage Committee first requested the State Party of Bangladesh to undertake a Strategic Environmental Assessment “to ensure that cumulative impacts of developments in the Sundarbans are adequately assessed, including in relation

to the OUV of the property" in its Decision **38 COM 7B.64** in 2014. In its Decision **39 COM 7B.8** the Committee further specified that the SEA should "assess the indirect and cumulative impacts from the power plants and other developments in the vicinity of the property, including a specific assessment of potential impacts on its OUV". In 2017, the Committee welcomed the commitment of the State Party to carry out the SEA.

The mission discussed the matter at length with the representatives of different Ministries and government agencies during the mission and then further during a meeting with the representatives of CEGIS, a public trust under the Ministry of Water Resources of the Government of Bangladesh[13] that was selected to undertake the SEA in consortium with Integra Consulting s.r.o. During this meeting the mission was presented with the approach that was proposed for the SEA, including the sectors it would cover:

- Water resources
- Power, energy and mineral resources
- Industry
- Road communications and bridges
- Navigation
- Forestry
- Fisheries
- Civil aviation and tourism
- Urbanization and livelihoods

Following the mission, on 30 December 2019, the State Party also submitted to the WHC for consideration by the mission team, some additional information, including the "Terms of Reference for Selection of Consulting Firm (International or National-International JV) for Conducting the Strategic Environmental Assessment (SEA) for Conservation of South West (SW) region of Bangladesh including the Sundarbans".

Noting the complexity of the property and the continued potential threats from large-scale industrial developments, the SEA will serve as a critical instrument to prevent negative impacts on the property. The Netherlands Commission for Environmental Assessments (NCEA) is understood to be providing technical support to the State Party, particularly on capacity building.

Recommendation 9
Prioritise the completion of the Strategic Environmental Assessment (SEA) for the south-west region of Bangladesh, in line with international best practice and with the support of the Netherlands Commission for Environmental Assessment (NCEA) as appropriate, and in consultation with the World Heritage Centre and IUCN.

Recommendation 10
Once the SEA is completed, ensure that the findings of the SEA become the basis for future decision making on developments in the vicinity of the property.

This section briefly outlines some of the key points related to the SEA and the conservation of the property structured around three topics – process, scope and future implementation,

[13] https://www.cegisbd.com/GenInfo

and how these aspects respond to the recommendations and requests made by the World Heritage Committee.

Process

Within the Government of Bangladesh, the coordination of the undertaking of the SEA is the responsibility of the BFD, the agency also responsible for the conservation and management of the property. The mission could observe that discussions between different Ministries and agencies had taken place and that these agencies are aware of the process and committed to providing the necessary inputs.

The BFD prepared the above-mentioned ToRs (provided to the mission after its visit, as noted above) and issued a tender for the selection of a company to undertake the SEA. Following this procedure, CEGIS and Integra Consulting s.r.o. were selected.

With regards to the process, the mission notes some concerns:

- Lack of public participation in the process has been evident and also expressed by the representatives of the civil society, whom the mission team met in Dhaka. It appears that very limited documentation was made publicly available during the process and that the civil society had no access to the information, for example the ToRs. Concerns were also expressed regarding the opportunities for the local communities and the civil society to provide the necessary inputs into the process in general.
- It remains somewhat unclear how the consortium between CEGIS and Integra Consulting is organized and how their joint work on the SEA will be organized, particularly given that CEGIS is a public trust under the Ministry of Water Resources.

In this regard the mission makes the following recommendation:

Recommendation 11
Ensure that key information related to the SEA (including ToRs, outline of the scope, stakeholder consultation timelines and approach, and methodology) is made publicly available, ideally through an online platform, and that the necessary public consultations are undertaken throughout the key steps of the process in an open and transparent manner.

Scope

While the information provided to the mission regarding the scope of the SEA was quite comprehensive and the mission could observe that thorough consideration was given to the fact that it would need to cover a wide range of economic sectors, it will be important to ensure that the interconnectedness of many of these sectors is taken into account, particularly when it comes to indirect and cumulative impacts, especially those associated with potential increases in transportation through waterways and ongoing need for dredging and maintenance. The mission therefore makes the following recommendation with regards to the scope of the SEA:

Recommendation 12
Ensure that the SEA not only covers the identified nine economic sectors, but also how they are interrelated and how plans and policies developed for one sector would potentially influence others, particularly what concerns shipping and associated infrastructure and maintenance, and includes a specific assessment of cumulative impacts on the property's OUV.

Recommendation 13
Ensure that the SEA, while aimed at developing a planning instrument for the South-West region of Bangladesh, also considers in its analysis, other relevant policies and proposed development plans in other areas, including outside the Bangladesh borders.

Implementation

While the commitment of the State Party to undertake the SEA could be confirmed by the mission, it will require strong ongoing commitment to ensure that the SEA can and will be implemented and indeed is used to guide different plans, policies and programmes, as well as to look at alternative options, in case certain plans and policies are confirmed to have potential negative impacts on the property.

A number of plans have been discussed during the mission, such as for example the new Master Plan for the Mongla Port, which was being developed at the time of the mission. It will be important to ensure that the development of this crucial document is based on the findings of the SEA.

Particularly important will be also the use of the SEA in developing policies and plans for the energy sector, including possible alternative options for electricity supply. The mission, however, felt that no thorough consideration had been given to how the SEA results are going to implemented and integrated into planning processes across different sectors. Therefore, the mission makes the following recommendation:

Recommendation 14
Ensure that a coordination mechanism, involving all relevant Ministries and agencies, is established to ensure the findings and recommendations of the SEA are implemented across all relevant national and regional plans and policies.

Overall, the mission notes that the preparation of the SEA should be seen as a critical instrument to prevent all possible negative impacts on the property. However, it will be essential to ensure that the SEA provides an adequate planning instrument, whose implementation would ensure that no large-scale industrial development would be permitted in the vicinity of the property and no further intensification of shipping and dredging would occur, if considered to have potential negative impacts on the OUV of the property. In case such negative impacts cannot be prevented, the property will be facing potential danger in line with Paragraph 180 of the *Operational Guidelines for the Implementation of the World Heritage Convention*. Therefore, the mission recommends that the World Heritage Committee review the progress

achieved in the development of the SEA at the next session with a view to considering, in the case of absence of substantial progress and confirmation of the ascertained or potential danger to the Outstanding Universal Value, the possible inscription of the Sundarbans World Heritage property on the List of World Heritage in Danger.

3.5 Management effectiveness / transboundary cooperation

The mission considers that a number of measures implemented by BFD have improved management effectiveness of the property, notably through strengthening SMART patrolling, which was introduced in 2015 as a new site-based approach to monitor, evaluate and improve the management effectiveness. These efforts, coupled with enhanced co-management efforts by BFD, local communities and other partners (UN and international organizations, NGOs), including joint community patrols, notably through the formation of the Village Tiger Response Team and the Dolphin Conservation Team while promoting Alternative Income Generation (AIG) opportunities, have greatly contributed to preventing illegal activities, better understanding the status and behaviour of key wildlife species and reducing human-wildlife conflicts especially with tigers.

The mission notes enhanced transboundary cooperation and communication between Bangladesh and India on issues concerning the property both at ministerial and site levels since the establishment of a Memorandum of Understanding (MoU) between the two States Parties in 2011 and the subsequent formation of the India-Bangladesh Joint Working Group (JWG) in 2016. The mission met concerned Ministries and IUCN Bangladesh who are members of the JWG from the Bangladesh side. Progress made on the nine action points agreed at the first JWG meeting in 2016 and to be reported at the second meeting scheduled for February 2020 was shared with the mission, including information sharing on the status of flora and fauna through biodiversity mapping, development of a common approach to conservation of the marine ecosystem, cooperation in the area of capacity building provided by the Wildlife Institute of India, UNESCO Category 2 Centre for World Natural Heritage Management and Training for Asia and the Pacific Region, and development of joint research on climate change impact on the Sundarbans. Given that the two World Heritage properties of “The Sundarbans” and “Sundarbans National Park” stand as one ecosystem and are shared habitats for key species, more concerted efforts by the two States Parties should be encouraged such as the use of consistent methodology to monitor the status of key species and setting up of a transboundary Marine Protected Area system.

Recommendation 15
Further strengthen and harmonize monitoring and conservation efforts between the States Parties of Bangladesh and India to improve transboundary management of the two World Heritage properties of “The Sundarbans” and “Sundarbans National Park” through the India-Bangladesh Joint Working Group (JWG).

3.6 Poaching

Overall, poaching of tigers appears to remain relatively low in Bangladesh compared to other countries. According to a 2016 report by TRAFFIC, there were 20 seizures with

estimated 41-55 tigers from Bangladesh in 2000-2015, which accounts for only 2.2% of the global total across all tiger countries[14].

However, pressure remains relatively high. The Bangladesh Tiger Action Plan 2018-2027 also notes the presence of shipping routes through the Sundarbans and of an international port in Mongla in its vicinity as potentially facilitating export of poached tiger parts to other countries[15]. Further expansion of the port and potential increase in international traffic is therefore considered as a potential additional pressure.

Killing of tigers also sometimes occurs in the villages surrounding the Sundarbans through retribution, with up to three tigers killed each year. However, the latest available figures show a significant decrease in the number of human-wildlife conflicts, including those when people were killed[16]. The mission had an opportunity to discuss this issue with the representatives of the BFD and was informed that a range of outreach and educational activities was being undertaken to raise awareness among local communities about the issue, which has led to a decrease in human-tiger conflicts recently.

4. ASSESSMENT OF THE STATE OF CONSERVATION OF THE PROPERTY

4.1 Population of key species

Bengal Tiger

Significant research and monitoring activities have been ongoing over a number of years to monitor the status of the tiger population in the Sundarbans.

In 1985, 350 tigers were estimated in the Bangladesh Sundarbans[17]. While the population has declined since then, recent estimates show some increase again in recent years. In 2015, the tiger population in the Bangladesh Sundarbans was estimated to be 106 (83-130)[18]. The most recent camera-trapping monitoring was undertaken in the Bangladesh Sundarbans in 2018. The results showed a population of 114 (SE: 89-146) tigers for the Bangladesh Sundarbans, which, compared to the baseline assessment of 2015, shows an increase of about 8%[19]. A study using a different methodology (molecular analysis of DNA contained in non-invasively collected genetic samples) estimated the tiger population in the

[14] Stoner S., Krishnasamy, K., Wittmann, T., Delean, S. and Cassy P. (2016). Reduced to skin and bones: full analysis. TRAFFIC report, Selangor, Malaysia.
[15] Khan, M.M., Ahsan, M.M., Jhala, Y.V., Ahmed, Z.U., Paul, A.R., Kabir, M.J., Morshed, H.M., Hossain, A.N.M. (2018). Bangladesh Tiger Action Plan, 2018-2027. Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project. Bangladesh Forest Department, Ministry of Environment and Forests.
[16] Khan, M.M., Ahsan, M.M., Jhala, Y.V., Ahmed, Z.U., Paul, A.R., Kabir, M.J., Morshed, H.M., Hossain, A.N.M. (2018). Bangladesh Tiger Action Plan, 2018-2027. Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project. Bangladesh Forest Department, Ministry of Environment and Forests.
[17] Blower, J.H. (1985). Wildlife conservation in the Sundarbans. Report of the Overseas Development Administration (ODA), Surry, UK.
[18] Dey, T.K., Kabir, M.J., Ahsan, M.M., Islam, M.M., Chowdhury, M.M.R., Hassan, S., Roy, M., Quershi, Q., Naha, D., Kumar, U. and Jhala, Y. V. (2015). First Phase Tiger Status Report of Bangladesh Sundarbans, 2015. Wildlife Institute of India and Bangladesh Forest Department, Ministry of Environment and Forests, Dhaka, Bangladesh. 37 pp.
[19] Aziz, M.A., Kabir, M.J., Shamsuddoha, M., Ahsan, M.M., Sharma, S., Chakma, S., Jahid, M., Chowdhury, M.M.R., and Rahman S.M. (2019). Second Phase Status of Tigers in Bangladesh Sundarban 2018. Department of Zoology, Jahangirnagar University; WildTeam, Bangladesh; Forest Department.

Bangladesh Sundarbans at 121 (84-158) individuals, based on samples collected in 2014-2015[20].

The results of the 2018 monitoring also showed some local differences in tiger density (e.g. the lower density is reported in Khulna area). It was also recommended to further research prey density and distribution in order to better understand predator-prey dynamics, which should also help estimate carrying capacity of the Sundarbans in terms of tiger population. Spotted deer (*Axis axis*) and to a lesser extent wild boar (*Sus scrofa*) currently represent the main prey for tigers[21], as many prey species previously present in Sundarbans, such as swamp deer (*Cervus duvauceli*), hog deer (*Axis porcinus*) and wild water buffalo (*Bubalus bubalis*) were reported to have disappeared from the area in the beginning of the 20th century[22].

Ganges River Dolphin and Irrawaddy Dolphin

The first dolphin surveys in Bangladesh undertaken in 2002 by Wildlife Conservation Society (WCS) estimated the population of the Ganges River Dolphin (*Platanista gangetica*) at 225 individuals and the population of the Irrawaddy Dolphin (*Orcaella brevirostris*) at 451[23]. The mission notes with some concern that systematic monitoring to establish long-term trends across the whole of the Sundarbans has not been put in place since, which makes it impossible to know what the long-term trends are and whether management actions are having an effect.

The mission notes that BFD has recently conducted dolphin surveys in 2018 and 2019, funded through the UNDP Expanding the Protected Area System to Incorporate Important Aquatic Ecosystems (EPASIIAE) Project, to create a baseline for dolphin populations for the 'whole of the Sundarbans', but which is currently limited to the three existing dolphin sanctuaries (Dangmari, Chadpai and Dudhmukhi). The mission appreciates the sharing of a draft preliminary report of survey results by the State Party. The report suggests that the number of dolphins has increased between 2018 and 2019, respectively from 47 to 72/74.

The mission makes the following observations on the above report:

- While the methodology used, direct count, is consistent between the years of 2018 and 2019, the seasons are not. The 2018 survey was conducted in the months of January-April and the 2019 survey in December. As such, the method does not account for seasonal movements of the dolphins in and out of the sanctuaries.
- The survey does not disaggregate the data by species so it will be impossible to observe trends of the two species.

[20] Aziz, M.A., Tollington, S., Barlow, A., Greenwood, C., Goodrich, J.M., Smith, O., Shamsuddoha, M., Islam, M.A., Groombridge, J.J. (2017). Using non-invasively collected genetic data to estimate density and population size of tigers in the Bangladesh Sundarbans. Global Ecology and Conservation (2017). https://doi.org/10.1016/j.gecco.2017.09.002

[21] Khan, M.M., Ahsan, M.M., Jhala, Y.V., Ahmed, Z.U., Paul, A.R., Kabir, M.J., Morshed, H.M., Hossain, A.N.M. (2018). Bangladesh Tiger Action Plan, 2018-2027. Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project. Bangladesh Forest Department, Ministry of Environment and Forests.

[22] Blower, J.H. (1985). Wildlife conservation in the Sundarbans. Report of the Overseas Development Administration (ODA), Surry, UK.

[23] Smith, B.D., Braulik, G., Strindberg, S., Ahmed, B., Mansur, R. (2006). Abundance of irrawardy dolphins (Orcaella brevirostris) and Ganges River dolphins (Platanista gangetica gangetica) estimated using concurrent counts made by independent teams in waterways of the Sundarbans mangrove forest in Bangladesh.

- The limited surveys within the sanctuaries cannot be used to determine trends across the whole of the Sundarbans since dolphins move in and out of the sanctuaries depending on the availability of prey and hydraulic refuge which varies greatly over time and space according to season, freshwater flow and tidal state, and river traffic.
- The use of the direct count method may no longer be the best available methodology on which to base a long-term monitoring program for abundance. Advances in dolphin counting and monitoring methodologies and technology suggest that combined visual-acoustic surveys[24] and the use of passive acoustic monitoring systems can better address detectability problems in the context of the Sundarbans and could be cost effective.

Recommendation 16
Convene a scientific advisory group/panel consisting of globally recognised experts in the Irrawaddy Dolphin and the Ganges River Dolphin to provide advice on establishing a baseline and long-term monitoring plan that includes a review of sampling sites and best available methodology including the use of the SMART system.

The mission, however, notes that establishment of dolphin sanctuaries has been an important step and acknowledges and appreciates the effort of the State Party to expand the number of dolphin sanctuaries from the present three (Dangmari, Chadpai and Dudhmukhi) covering 1070 ha with an additional three sanctuaries (Pankhali, Shibsha and Vodhra) covering 3427 ha.

4.2 Vegetation cover

The Sundarbans Reserved Forest is mostly comprised of two tree species: Sundari (*Heritiera fome*s; representing about 39%) and Gewa (*Excoecaria agalloch*; 39%)[25].

The most economically valuable wood species is Sundari, whose legal harvest has been banned since 1990 due to declining stocks, however, illegal felling continues[26]. Other species used either as building materials or as fuelwood include Gewa, Goran trees, Keora, Kankra (*Bruguiera spp*.), Baen, Dhundal (*Xylocarpus granatum*), passur (*Xylocarpus mekongensis*) and singra (*Cynometra* ramiflora)[27]. Rapid decline in Sundari and Gewa stock was reported in 1990s. However, the negative trends of the 1990s appear to have been reversed thanks to conservation actions and, although the area remains under significant pressure from population growth and high dependency on natural resources, the rapid decline in vegetation cover due to direct anthropogenic pressure seems to have

[24] Richman NI, Gibbons JM, Turvey ST, Akamatsu T, Ahmed B, Mahabub E, et al. (2014) To See or Not to See: Investigating Detectability of Ganges River Dolphins Using a Combined Visual-Acoustic Survey. PLoS ONE 9(5): e96811. https://doi.org/10.1371/journal.pone.0096811
[25] Aziz, M.A., Tollington, S., Barlow, A., Greenwood, C., Goodrich, J.M., Smith, O., Shamsuddoha, M., Islam, M.A., Groombridge, J.J. (2017). Using non-invasively collected genetic data to estimate density and population size of tigers in the Bangladesh Sundarbans. Global Ecology and Conservation (2017). https://doi.org/10.1016/j.gecco.2017.09.002
[26] Khan, M.M., Ahsan, M.M., Jhala, Y.V., Ahmed, Z.U., Paul, A.R., Kabir, M.J., Morshed, H.M., Hossain, A.N.M. (2018). Bangladesh Tiger Action Plan, 2018-2027. Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project. Bangladesh Forest Department, Ministry of Environment and Forests.
[27] Khan, M.M., Ahsan, M.M., Jhala, Y.V., Ahmed, Z.U., Paul, A.R., Kabir, M.J., Morshed, H.M., Hossain, A.N.M. (2018). Bangladesh Tiger Action Plan, 2018-2027. Strengthening Regional Cooperation for Wildlife Protection (SRCWP) Project. Bangladesh Forest Department, Ministry of Environment and Forests.

decreased. On the other hand, the broader impacts of the overall reduction in freshwater flows to the Bangladesh Sundarbans and the further future impacts of climate change on the mangrove species composition, distribution and resilience will need to be further assessed.

While climate change was not specifically addressed as a key threat to the OUV of the property during the mission, scientific studies indicate impacts of climate change on the composition of plant species in the property, including top dying of Sundari due to increased salinity which is accelerated by climate change[28].

4.3 Freshwater flows

The Sundarbans ecosystem is dependent on adequate freshwater flow from the Ganga basin, and to a limited extent, the Brahmaputra (Jamuna) and Meghna Rivers (Figure 16). The diversion of the Ganga water following the construction of the Farakka Barrage in India in 1975, combined with increased water extraction for agricultural irrigation and industrial activity, has resulted in drastically reduced freshwater flows into the Sundarbans ecosystem. The impact is exacerbated by sea-level rise and by increase in average water temperature due to atmospheric warming.

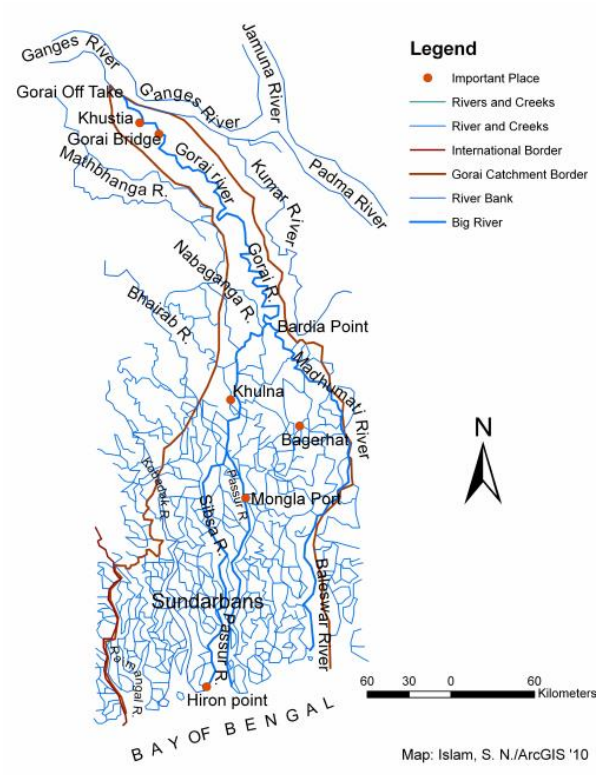


Figure 16: Rivers flowing into the Sundarbans (Source: Islam et al., 2011)

The main tributary leading from the Ganga to the property is the Gorai river. Subsequent to the damming of the Ganga, the Gorai river flows have been reduced to a marginal fraction of the original flows (Figure 17). Restoration of these flows is foreseen under the

[28] Rahman, M. (2020) Impact of increased salinity on the plant community of the Sundarbans Mangrove of Bangladesh. COMMUNITY ECOLOGY 21, 273–284 (2020). https://doi.org/10.1007/s42974-020-00028-1

Bangladesh Delta Plan-2100. The mission was informed that a “Gorai River dredging and bank protection” project has been approved to be completed in 2022.

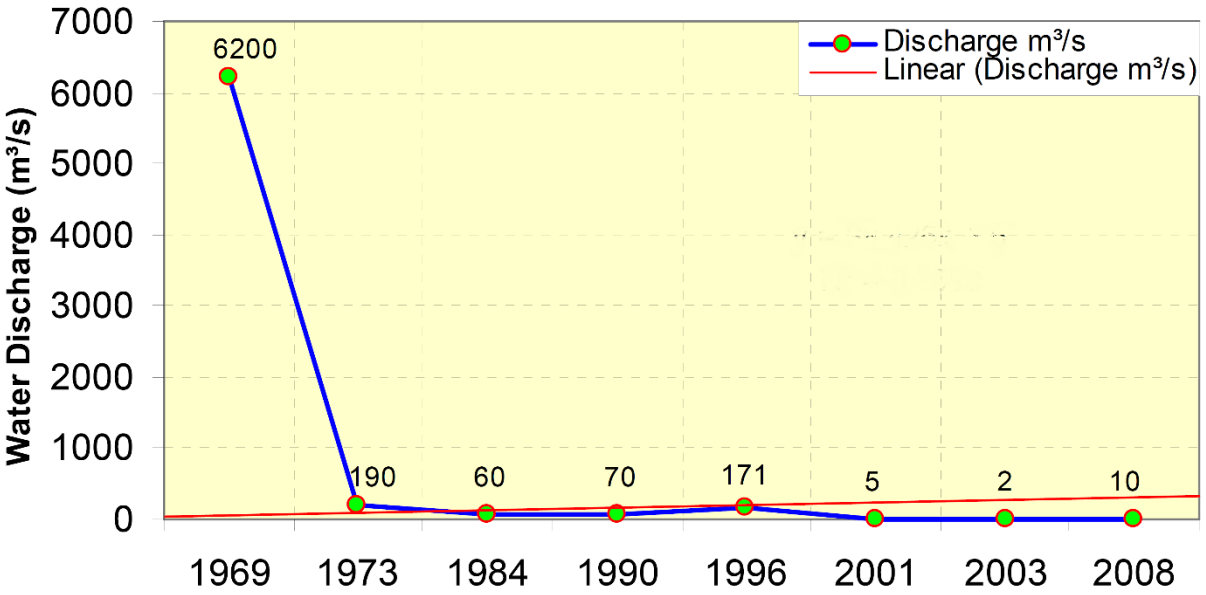


Figure 17: Discharge of the Gorai River from 169 to 2008. (Source: Islam et al, 2011)

Freshwater flow reductions are particularly critical in the dry season. As a result, siltation and salinity have increased substantially in the waterways of the Sundarbans and are threatening the overall balance of the ecosystem and its functioning (Figure 18) [29][30], This is exacerbated by higher than average increases in water temperatures and resulting evaporation. Research indicates that the sea level in the Bay of Bengal is also rising more rapidly than global averages[31][32].

[29] Anjum, Farzana & Sattar, Golam & Adham, Md & Hossain, Shahadat. (2018). Impact of Climate Change and Ganges Discharge on the Salinity of the Passur River, Southwestern Bangladesh. Asian Journal of Environment & Ecology. 7. 1-19.
[30] Islam, Shafi & Gnauck, Albrecht. (2011). Water Shortage in the Gorai River Basin and Damage of Mangrove Wetland Ecosystems in Sundarbans, Bangladesh. Conference paper. 3rd International Conference on Water and Flood Management
[31] Loucks, Colby & Barber-Meyer, Shannon & Hossain, Md & Barlow, Adam & Chowdhury, Ruhul. (2010). Sea Level Rise and Tigers: Predicted Impacts to Bangladesh's Sundarbans Mangroves. Climatic Change. 98. 291-298.
[32] Mitra, Abhijit & Gangopadhyay, Avijit & Dube, Anumeha & Schmidt, Andre & Banerjee, Kakoli. (2009). Observed changes in water mass properties in the Indian Sundarbans (northwestern Bay of Bengal) during 1980-2007. Current Science. 97.

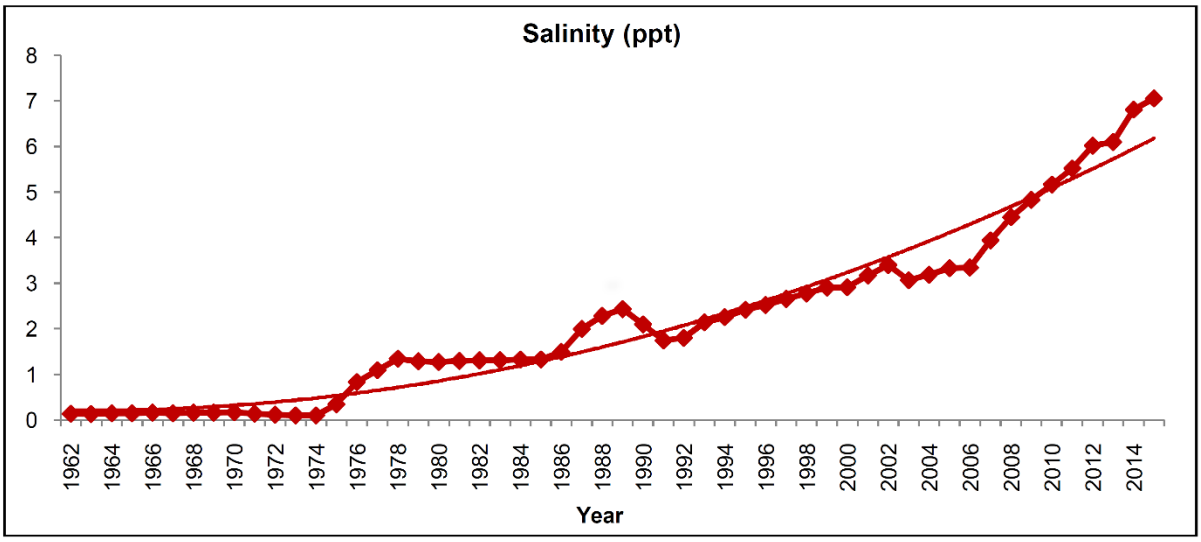


Figure 18: Salinity of the Pashur River at Mongla from 1962 to 2014. (Source: Anjum et al, 2018)

The mission considers the cumulative impact of these changes as a significant threat to the OUV of the property, because it negatively affects the soil, water, vegetation and wildlife and reduces the growth and regeneration of the mangrove ecosystem. Biodiversity is higher in the low salinity areas of the SRF and increased salinity is expected to result in changes to the composition, dominance and number of species in those previously less saline areas. Research indicates that due to increased salinity, salt tolerant mangrove species are expanding and gradually displacing other species. Increased salinity simultaneously stimulates an increase in barren areas. Silt deposition causes a rise in the forest floor and when combined with the effect from irregular tidal water flow, mangrove regeneration can be reduced or inhibited[33]. It is estimated that several mangrove species are likely to disappear in the next few decades due to this process thereby changing the structural and functional characteristics that make up the property's OUV[34].

Scientific research comparing vegetation changes in the eastern and western part of the Sundarbans in Bangladesh between 1985 and 1995 confirms a general reduction of commercially valuable species such as Sundri (*Heritiera fomes*) and Gewa (*Excoecaria agallocha*) and an increase in less valued smaller tree species[35]. Further research conducted in 2011, indicates that the central longitudinal belt of the forest is converting into a high salinity zone which will accelerate these changes.

Human development of the region is likely to result in additional impacts on the hydrology. Jessore District, north of the Sundarbans, through which the Gorai River flows, has seen a population growth of 33% between 1991 and 2011[36]. Both domestic and industrial water needs can be expected to continue to grow proportionally. Limited data is available regarding the status of groundwater and its role in the ecosystem. However, research

[33] De Lacerda L. D. (ed.) (2002). Mangrove Ecosystems. Springer. 298 p.
[34] Islam and Gnauck. (2009). Threats to the Sundarbans Mangrove Wetland Ecosystems from Transboundary Water Allocation in the Ganges Basin: A Preliminary Problem Analysis. International Journal of Ecological Economics and Statistics. Threats. 299, vol. 13, pp. 64-78.
[35] Mirza M. Q. (2004). The Ganges Water Diversion: Environmental Effects and Implications, Springer.
[36] Bangladesh bureau of statistics website, (cons. 15/1/2020), http://203.112.218.65:8008/WebTestApplication/userfiles/Image/District%20Statistics/Jessore.pdf

suggests that groundwater depletion has an additional negative impact on Ganga river baseflow[37].

The cumulative impact of the reduced freshwater inflow, rising sea levels and changes in rainfall, demographic and development pressures, has already resulted in significant changes in the hydrology of the property. All indicators confirm that these trends will continue.

The geographic characteristics of the property and its catchment area results in important transboundary factors. The States Parties of Bangladesh and India signed a Treaty in 1996 for sharing the Ganges waters for a period of 30 years. The Treaty ends in 2026, which is an opportunity to review the components. As one of the older bilateral water agreements, criticised for being very narrow in scope[38], and given the general scarcity of transboundary agreements in the subregion[39], it is recommended to assess international best practice and scientific evidence to develop a new comprehensive, science-based, transboundary river basin agreement.

The States Parties of Bangladesh and India have also entered into the aforementioned MoU regarding the Sundarbans, that is mainly focused on ecology, particularly wildlife[40]. Given its relevance to the integrity of the property, it is recommended to integrate cooperative action in the ecohydrology of the delta in this bilateral instrument.

Considering the present situation, better integrated, long-term, basin-wide cooperation across and between the different countries involved, leading to concerted decisions and practical actions, is urgently needed. It is also clear that comprehensive hydrological data is lacking and more systematic research is required to document the changes occurring in the ecosystem across both the SRF and the property. It is therefore imperative that the SEA include the water sector as a priority sector.

Considering the existing impact of increased salinity to the OUV of the property, and drivers for further increase, including sea level rise and freshwater demands related to domestic and economic use; and the absence of an existing basin management plan, the mission recommends the following as a matter of urgency:

Recommendation 17
Ensure that the SEA includes the water sector as a priority sector in its scope, and determines a range of scenarios for freshwater inflow in function of projected trends and water management interventions; against the corresponding impacts for the integrity of the property.

Recommendation 18

[37] Mukherjee, A., Bhanja, S. N., & Wada, Y. (2018). Groundwater depletion causing reduction of baseflow triggering Ganges river summer drying. Scientific reports, 8(1), 12049. doi:10.1038/s41598-018-30246-7
[38] See eg Kimberley Anh Thomas; The Ganges water treaty: 20 years of cooperation, on India's terms. Water Policy 1 August 2017
[39] World Water Development Report, United Nations, 2020
[40] MOU between India and Bangladesh on Conservation of the Sundarban, Sept 06, 2011 - https://mea.gov.in/bilateral-documents.htm?dtl/5141/MOU+between+India+and+Bangladesh+on+Conservation+of+the+Sundarban

Undertake a coordinated effort between the States Parties of Bangladesh and India to strengthen integration of the hydrology of the property in bilateral cooperation, through:
a) Inclusion of ecohydrological cooperation for the delta under the Bangladesh-India MoU on conservation of the Sundarbans;
b) Incorporation of the long-term integrity of the property as a priority in the review of the Ganga Treaty between the States Parties, which expires in 2026, based on scientific models including the findings of the SEA.

4.4 Consequences for the region/population/employment and alternative livelihoods

The mission was briefed on a number of implemented and ongoing AIG-related projects, and met a representative of a women's group which conducts community patrol while also running eco-cottage and making handicrafts for tourists. Active involvement of local communities in conservation and monitoring of the SRF through co-management approaches as promoted by the Integrated Resources Management Plans for the Sundarbans (2010-2020)[41] complements BFD's efforts to keep the OUV of the property intact. The expansion of the three Wildlife Sanctuaries and the establishment of the Dolphin Hotspots are significant positive moves towards better conservation outcomes. At the same time, given that the SRF has been a source of livelihoods for 3.5 million people, it is important to ensure that these new measures do not negatively affect livelihoods, food security and socio-cultural practices of the forest dependent people including fishers as the communities are facing increasing disaster risks and the impact of climate change. Several studies suggest that sustainable forest resource use based on traditional knowledge and practices could be compatible with conservation of the SRF[4243]. The *Operational Guidelines for the Implementation of the World Heritage Convention*[44] also note that human activities, including those of traditional societies, local communities and indigenous peoples, may be consistent with the OUV of the area where they are ecologically sustainable, given that biological diversity and cultural diversity can be closely linked and interdependent (Paragraph 90), and this is also supported by *the 2015 Policy Document for the Integration of a Sustainable Development Perspective into the Processes of the World Heritage Convention*[45]. In this regard, provisions of sustainable AIG opportunities should be further encouraged, in close consultation with community members and in cooperation with different partners, in order to strengthen social and economic resilience of local communities, beyond the timeframe of the current Integrated Resources Management Plans.

[41] Bangladesh Forest Department (BFD). (2010). Integrated Resources Management Plans for The Sundarbans (2010-2020); http://103.48.18.141/library/wp-content/uploads/2018/11/5-44-NN_SRF_IRMP_Volume-1.pdf
[42] Titumir, R.A.M and Afrin, T. (2017) The complementarity of human and nature well-being: A case illustrated by traditional forest resource users of the Sundarbans in Bangladesh. In UNU-IAS and IGES (eds) 2017, Sustainable livelihoods in socio-ecological production landscapes and seascapes (Satoyama Initiative Thematic Review Vol.3), United Nations University Institute for Advanced Studies of Sustainability, Tokyo. https://collections.unu.edu/eserv/UNU:6444/SITR_vol3.pdf
[43] Nishat, B. (2019). Landscape Narrative of the Sundarbans: Towards Collaborative Management by Bangladesh and India (English). Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/539771546853079693/Landscape-Narrative-of-the-Sundarban-Towards-Collaborative-Management-by-Bangladesh-and-India
[44] *Operational Guidelines for the Implementation of the World Heritage Convention* (2019 edition); https://whc.unesco.org/document/178167
[45] https://whc.unesco.org/document/139747

It should be also noted that continued development around the Mongla Port / EPZ could impose additional pressure on the Sundarbans ecosystem through the population increase in the region and subsequent increase in resource demands and pollution.

Recommendation 19
Continue efforts to actively involve local communities in co-management of the SRF, and to provide sustainable alternative income generating (AIG) opportunities beyond the timeframe of the Integrated Resources Management Plans for the Sundarbans (2010-2020).

5. CONCLUSIONS AND RECOMMENDATIONS

The mission concludes that many of the threats identified by the 2016 Reactive Monitoring mission continue to be of concern and that while some progress has been achieved to initiate an SEA to assess their impacts on the property (as discussed further below), this initial step alone does not yet protect the property from possible negative impacts of different development projects.

However, overall, the mission also concludes that the OUV of the property remains preserved. While hydrological dynamics in the Sundarbans had been affected by a number of factors and projects, such as construction of barrages and increasing water extraction, in the past, including before the property was inscribed on the World Heritage List, , overall, hydrological and ecological processes underpinning the OUV of the property, such as tidal influence, formation of deltaic islands and their subsequent colonization, continue their course, demonstrating the ecological resilience of the Sundarbans ecosystem for now. . Therefore, the preparation of the SEA for the south-west region of Bangladesh, initiated by the State Party, should be seen as a critical instrument to prevent all possible negative impacts on the property. The mission therefore makes the following recommendations regarding this process:

- ***Prioritise the completion of the Strategic Environmental Assessment (SEA) for the south-west region of Bangladesh, in line with international best practice and with the support of the Netherlands Commission for Environmental Assessment (NCEA) as appropriate, and in consultation with the World Heritage Centre and IUCN. [R9]***
- ***Until the SEA is completed, ensure that no further decision is made for any new large-scale industrial and/or infrastructure developments in the vicinity of the property, including further development of the Mongla Port and any other development that might further increase traffic on the Pashur River. [R7]***
- ***Once the SEA is completed, ensure that the findings of the SEA become the basis for future decision making on developments in the vicinity of the property. [R10]***

In the course of developing the SEA:

- ***Ensure that the SEA not only covers the identified nine economic sectors, but also how they are interrelated and how plans and policies developed for one sector would potentially influence others, particularly what concerns shipping and associated infrastructure and maintenance, and that it includes a specific assessment of cumulative impacts on the property's OUV. [R12]***
- ***Ensure that shipping and dredging are included as priority sectors in the scope of the SEA, including long-term and least-impact options regarding the continued use of the Pashur estuary as anchor and transfer area, proposed measures to minimize the river traffic and its impact, and options regarding disposal of major and minor dredged materials. [R6]***
- ***Ensure that the SEA includes the water sector as a priority sector in its scope, and determines a range of scenarios for freshwater inflow in function of***

projected trends and water management interventions, against the corresponding impacts for the integrity of the property. [R17]

- ***Ensure that the SEA, while aimed at developing a planning instrument for the South-West region of Bangladesh, also considers in its analysis, other relevant policies and proposed development plans in other areas, including outside the Bangladesh borders. [R13]***
- ***Ensure that key information related to the SEA (including ToRs, outline of the scope, stakeholder consultation timelines and approach, and methodology) is made publicly available, ideally through an online platform, and that the necessary public consultations are undertaken throughout the key steps of the process in an open and transparent manner. [R11]***
- ***Establish a coordination mechanism, involving all relevant Ministries and agencies, to ensure the findings and recommendations of the SEA are implemented across all relevant national and regional plans and policies. [R14]***

The mission also concludes that it will be essential to ensure that the SEA provides an adequate planning instrument, whose implementation would ensure that no large-scale industrial development would be permitted in the vicinity of the property and no further intensification of shipping and dredging would occur if considered to have potential negative impacts on the OUV of the property. In case such negative impacts cannot be prevented, the property will be facing potential danger in line with Paragraph 180 of the *Operational Guidelines for the Implementation of the World Heritage Convention*. Therefore, the mission recommends that the World Heritage Committee review the progress achieved in the development of the SEA at the next session with a view to considering, in the case of absence of substantial progress and confirmation of the ascertained or potential danger to the Outstanding Universal Value, the possible inscription of the Sundarbans World Heritage property on the List of World Heritage in Danger.

Beyond these recommendations concerning the SEA, the mission also makes the following more detailed recommendations regarding the specific projects that were discussed during the course of the mission and that have been mentioned in previous World Heritage Committee Decisions, namely the Rampal, the Taltoli and the Kolapara power plants:

- ***Ensure greater use of the Independent Monitoring Panel, which was established to provide the State Party with advice on the construction and operation of the Rampal power plant, to address concerns from third parties over the construction of Rampal power plant. [R2]***
- ***Consider other functionally independent advisory panel processes, such as IUCN's Independent Scientific and Technical Advisory Panel (ISTAP), as possible models to ensure greater transparency and public trust in the process, and to expand the scope of communication and engagement with third parties to include the state of conservation of the property in relation to other industrial and power plant developments, and the SEA. [R3]***

- ***Monitor underwater noise pollution (vessel noise) in or near dolphin habitats/sanctuaries created by increased river traffic from coal shipments in the Pashur River and ensure that the issue of increasing noise pollution and its impacts on aquatic fauna is considered by the SEA. [R1]***
- ***Submit the study on the river dolphins in the Buriswar-Payra River with respect to the Taltoli (Barisal) power plant development and its associated increased shipping activities, to the World Heritage Centre for review by IUCN when available, and ensure any findings of negative impacts are immediately addressed through the implementation of mitigation measures. [R4]***
- ***Before proceeding any further with the development of the Payra Thermal power plant (also known as Kolapara power plant), develop a Dolphin Conservation Plan to prevent any adverse effects on the river dolphins that are present within the project area, and submit the Plan to the World Heritage Centre for review by IUCN as soon as it is available. [R5]***

As noted above, possible indirect impacts from industrial development through increased shipping and dredging are of particular concern and the mission therefore makes the following recommendations regarding the relevant processes and existing instruments:

- ***Clearly address the responsibility of the government to protect the OUV of the property in the National Oil and Chemical Spill Contingency Plan (NOSCOP), and develop an effective localized contingency plan covering the property in accordance with the national plan outlining measures to prevent any future oil and chemical spill incidents within and in proximity to the property and to ensure immediate and coordinated actions for mitigating impacts on the property in case of emergencies. [R8]***

Further recommendations by the mission include areas of transboundary cooperation notably in the area of freshwater management particularly in view of halting siltation trends and further risks for degradation of the ecosystem, which will be exacerbated from climate change-induced rainfall changes and sea level rise, as well as other conservation measures, including those addressing other threats to the property:

- ***Further strengthen and harmonize monitoring and conservation efforts between the States Parties of Bangladesh and India to improve transboundary management of the two World Heritage properties of "The Sundarbans" and "Sundarbans National Park" through the India-Bangladesh Joint Working Group (JWG). [R15]***
- ***Undertake a coordinated effort between the States Parties of Bangladesh and India to strengthen integration of the hydrology of the property and the Sundarbans National Park in India in bilateral cooperation, through:***
    - ***a) Inclusion of ecohydrological cooperation for the delta under the Bangladesh-India MoU on conservation of the Sundarbans;***
    - ***b) Incorporation of the long-term integrity of the property as a priority in the review of the Ganga Treaty between the States Parties, which***

expires in 2026, based on scientific models including the findings of the SEA. [R18]

- ***Continue efforts to actively involve local communities in co-management of the Sundarbans Reserve Forest, and to provide sustainable alternative income generating (AIG) opportunities beyond the timeframe of the Integrated Resources Management Plans for the Sundarbans (2010-2020). [R19]***
- ***Convene a scientific advisory group/panel consisting of globally recognised experts in the Irrawaddy Dolphin and the Ganges River Dolphin to provide advice on establishing a baseline and long-term monitoring plan that includes a review of sampling sites and best available methodology including the use of the SMART system. [R16]***

6. ANNEXES

Annex I: Recommendations from the 2016 joint World Heritage Centre/IUCN Reactive Monitoring mission

The mission considers that the State Party should take urgent measures to immediately implement the following recommendations to prevent further erosion of the OUV and address important threats to the property:

R1. Considering the impact to the OUV of the property, the structural changes to the ecosystem and its functioning, resulting from higher salinity, in particular in the southern areas of the SRF where the World Heritage property is located, and the continued lack of sufficient provision to secure adequate freshwater flows into the area, it is recommended that as a matter of utmost urgency and without delay:

a) The Ganges water sharing Treaty between India and Bangladesh is fully implemented in a coordinated effort by the States Parties of Bangladesh and India to ensure adequate freshwater inflow;

b) A comprehensive, multilateral and integrated freshwater inflow management plan is designed and implemented, accompanied by the necessary monitoring to measure salinity and water quality, including groundwater, throughout the property. Future management decisions should be informed by these monitoring results.

R2. In relation to the Rampal power plant, considering the high likelihood for: (i) contamination of the property and the surrounding Sundarbans forest from air and water pollution arising from both its location, in a wind risk zone, and its anticipated methods to minimise impacts; (ii) the substantial increase in shipping and dredging required in the immediate vicinity of the property for the plant's construction and operation; (iii) the additional removal of freshwater from an already increasingly saline environment that is starting to alter the functioning of the ecosystem; (iv) an EIA that does not address the effects on the OUV of the property nor provide convincing evidence that effects on the Sundarbans will be mitigated; and (v) the intrinsic connectivity between the property and the Sundarbans forest, it is recommended that the Rampal power plant project is cancelled and relocated to a more suitable location, where it would not impact negatives on the Sundarbans Reserved Forest and the property.

R3. The mission recommends that the State Party halts all development of the site of the Orion Power Plant in Khulna, and any similar proposed development, until an independent, comprehensive and scientifically sound EIA has been conducted and provided to the World Heritage Centre and IUCN for their review and evaluation. If impacts on the OUV of the property or its immediate surroundings cannot be addressed in a scientifically sound manner, it is recommended that the projects be cancelled and relocated to more suitable locations.

R10. Considering the multiple activities outside the property that are impacting on its OUV, it is recommended that the State Party puts in place a system that allows management of the property in a more integrated manner. Such a system should ensure:

a) Sufficient freshwater flows into the property to maintain its ecosystem health, balance and functioning;

b) Decisions for further economic development and associated activities such as shipping and dredging are not taken in isolation but are subject to a Strategic Environmental Assessment (SEA) for the property and its surrounding areas upon which it is dependent;

c) The economic and industrial carrying capacity of the areas surrounding and in close proximity to the property are defined in a transparent and scientifically sound manner and its limits reflected in decision making;

d) Sufficient financial and human resources are made available to provide for the long-term management and patrolling of the area and resource extraction including control of illegal activities such as poaching of wildlife and non-compliance with existing regulations.

The mission considers that the following recommendations to further improve the conservation of the property and strengthen its management should be implemented as soon as possible:

R4. Considering the potential threats to the property from increased shipping and required dredging, the planned expansion and increase in use of the Mongla Port requires urgent clarification. It is recommended that the State Party halt all expansion activities until an independent, comprehensive and scientifically sound EIA that specifically considers the impacts on the OUV of the property has been conducted and provided to the World Heritage Centre and IUCN for their review and evaluation.

R5. Enforce the permanent closure of the Shela River to all vessel traffic, national and international, and apply speed limits and effective control measures for night and poor weather conditions for vessels navigating along the Pashur River.

R6. Develop an effective action plan and emergency response facility in consultation with all relevant stakeholders to react to any future shipping incidents in a timely and coordinated manner, and consistent with the recommendations made in the United Nations Development Programme (UNDP) oil spill assessment report.

R7. Develop, finalise and submit for review by the World Heritage Centre and IUCN, a detailed assessment of potential impacts of current and planned dredging and associated activities on the OUV and integrity of the property.

R8. Enhance and strengthen human and financial resources, capacity and inter-agency cooperation, including between local and national authorities, and law enforcement to adequately address wildlife trade, transportation, and sale, including actions and budget to facilitate increased staffing, patrolling and engagement with local communities to garner their support for the continued protection of the property and its OUV against poaching.

R9. Taking into account that climate change is a global problem requiring a concerted global solution, it is strongly recommended that, at the level of the property, the State Party reduce other threats in the property and its surrounding area to secure maximum resilience of the property in the face of climate change impacts. Ecological monitoring for the property should include indicators that measure climate change impacts in view of identifying both short-term and long-term effects on the OUV of the property and the ways and means to effectively address them and the capacity of management staff to plan for impacts from climate change should be further developed.

Annex II: Terms of reference

Joint World Heritage Centre/IUCN Reactive Monitoring mission

The Sundarbans (Bangladesh)

December 2019 (9-17 December 2019)

At its 43rd session, the World Heritage Committee requested the State Party of Bangladesh to invite a joint World Heritage Centre/IUCN Reactive Monitoring mission to the World Heritage property 'The Sundarbans' and recommended that this mission takes place by the end of 2019 (Decision **43 COM 7B.3**, Annex I). The main objective of the Reactive Monitoring mission is to assess the state of conservation of the property, in particular the level of threats to the hydrological and ecological dynamics, which underpin the Outstanding Universal Value (OUV) of the property. The mission will therefore carry out the following tasks:

1. Assess the status and planning of any industrial and/or infrastructure developments, including the Rampal, Taltoli and Kolapara power plant projects, and the impacts of these projects on the OUV of the property;
2. Assess the status and planning of any dredging of the Pashur River and any rivers within the property;
3. Evaluate the progress achieved by the State Party in the undertaking of the Strategic Environmental Assessment (SEA) for the South-West region of Bangladesh, including the property, requested by the World Heritage Committee in its Decision **41 COM 7B.25** (Annex I), review the Terms of Reference of the SEA and assess if the necessary measures were taken so that the SEA is conducted in accordance with international standards and best practice, and provide any necessary technical advice to the State Party in this regard, including on how the SEA results could be translated into concrete policy actions;
4. Review the progress towards finalizing the National Oil Spill and Chemical Contingency Plan, and in ensuring adequate provision of funding and human resources for the implementation of the Plan;
5. Assess progress with the implementation of the 2016 Reactive Monitoring mission recommendations, adopted by the Committee in its Decision **41 COM 7B.25**;
6. In line with paragraph 173 of the *Operational Guidelines*, assess any other relevant issues that may negatively affect the OUV of the property, including its conditions of integrity and protection and management.

The State Party should facilitate necessary field visits to key locations, including those related to any industrial projects referred to in Committee's Decisions **43 COM 7B.3** and **41 COM 7B.25,** particularly the Rampal power plant, as well as other locations relevant for understanding other threats affecting the property and its ecological and hydrological dynamics.

To enable the mission's preparation, the State Party should, as soon as possible and preferably no later than one month prior to the mission, provide the World Heritage Centre and IUCN with:

a. Detailed information on the current status of the SEA requested by the World Heritage Committee in its Decision **41 COM 7B.25**;
b. Updated information on the current status of existing and planned industrial projects which might negatively affect the property, including any relevant Environmental Impact Assessments (EIAs);
c. Updated information on the current status of any dredging inside the property or in its vicinity, including any relevant EIAs if available;
d. The most recent versions of relevant management plans for the property.

The mission should hold consultations with the relevant authorities of Bangladesh, including the Ministry of Environment, Forest and Climate Change and the Ministry of Power, Energy and Mineral Resources, as well as relevant regional and local authorities. In addition, the mission should hold consultations with a range of relevant stakeholders, including representatives of: i) the India-Bangladesh Joint Working Group of the Sundarbans; ii) companies related to the above-mentioned development projects including the Bangladesh India Friendship Power Company Ltd; iii) institution(s) involved in the SEA (including the contractor hired for the SEA); iv) non-governmental organizations (NGOs) and civil society; v) the IUCN Bangladesh office; vi) local communities; and vii) relevant scientists and experts. The State Party should facilitate and organize the site visits and meetings with the above-mentioned stakeholders and submit a draft agenda for the mission one month prior to the mission with details of all proposed site visits and meetings.

Based on the results of the above-mentioned reviews, assessments and discussions with the State Party representatives, authorities and stakeholders, the mission should prepare a concise report (Annex II of the Mission Report Format) on the findings and recommendations following the site visit. The mission's recommendations to the Government of Bangladesh and the World Heritage Committee should have the objective of providing guidance to the State Party to ensure the ongoing conservation of the property's OUV. It should be noted that recommendations should be provided in the mission report and not during the mission implementation.

Annex III: Decisions of the World Heritage Committee

World Heritage Committee, 43rd session (Baku, 2019)

Decision: 43 COM 7B.3

The World Heritage Committee,

1. Having examined Document WHC/19/43.COM/7B.Add,

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

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);

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;

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 the Bangladesh Delta Plan 2100 to protect and expand the Sundarbans;

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;

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;

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;

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;

10. Requests the State Party to invite 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;

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 2020 so that the Committee can decide on whether or not to inscribe the property on the List of World Heritage in Danger.

World Heritage Committee, 41st session (Krakow, 2017)

Decision: 41 COM 7B.25

The World Heritage Committee,

1. Having examined Document WHC/17/41.COM/7B,

2. Recalling Decision **39 COM 7B.8**, adopted at its 39th session (Bonn, 2015),

3. Welcomes the State Party's decision not to approve the Orion power plant and Phase II of the Rampal power plant,

4. Also welcomes the State Party's decision to carry out a Strategic Environmental Assessment (SEA) for the South-West region of Bangladesh, including the property, and requests the State Party to ensure that any large-scale industrial and/or infrastructure developments will not be allowed to proceed before the SEA has been completed, and to submit a copy of the SEA to the World Heritage Centre for review by IUCN, in accordance with Paragraph 172 of the Operational Guidelines, as soon as it is available;

5. Also welcomes the information provided on ecological monitoring and notes with concern that sea level rise, salt intrusion and reductions in fresh water flows are posing a threat to the Sundarbans' ecosystem and that the property is particularly vulnerable to impacts from these threats;

6. Takes note of the critical importance of transboundary cooperation between the States Parties of Bangladesh and India on the World Heritage properties "The

Sundarbans" (Bangladesh) and "Sundarbans National Park" (India), further welcomes the efforts made by both States Parties to enhance collaboration, and urges the State Party of Bangladesh to fully implement the recommendations made by the 2016 mission in relation to ensuring adequate freshwater inflows to the property;

7. Also requests the State Party to make constant efforts to fully implement all the other recommendations made by the 2016 Reactive Monitoring mission;

8. Welcomes furthermore the development of a draft "National Oil Spill and Chemical Contingency Plan" (NOSCOP), and further requests the State Party to ensure adequate provision of funding and human resources for the implementation of the plan once it is adopted, and to 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 and requests furthermore the State Party to put in place a management system for shipping to minimize negative impacts on the property, including from associated activities such as dredging;

9. Reiterates its request to the State Party to undertake the Environmental Impact Assessment (EIA) for any future dredging of the Pashur River to include an assessment of impacts on the Outstanding Universal Value (OUV) of the property, as requested by the Committee;

10. Also takes note of the mission's concerns about the likely environmental impacts of the Rampal coal-fired power plant on the property arising from air and water pollution, a substantial increase in shipping and dredging, and additional removal of freshwater from an already increasingly saline environment and requests furthermore the State Party to ensure that these impacts are comprehensively assessed as part of the SEA and adequate technological measures are put in place to mitigate these impacts and to put in place adequate measures to mitigate these impacts, in order to avoid damage to the OUV of the property;

11. Finally requests the State Party to submit to the World Heritage Centre, by **1 December 2018**, 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 43rd session in 2019.

Annex IV: Composition of the mission team

World Heritage Centre
Guy Broucke (Programme Specialist for Natural Sciences, UNESCO New Delhi Office)
Akane Nakamura (Junior Professional Officer, Asia and the Pacific Unit, World Heritage Centre)

IUCN
Elena Osipova (Senior Monitoring Officer, World Heritage Programme, IUCN)
Andrew Wyatt (Deputy Head, Indo-Burma Group, IUCN)

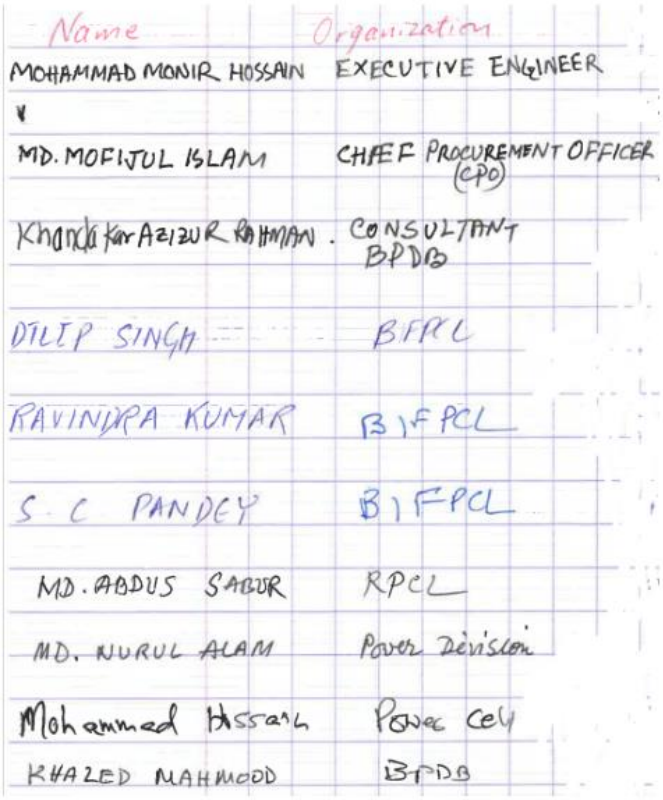
UNESCO Dhaka Office
N. M. Ziaul Hoque (Operations Manager, UNESCO Dhaka Office) – during the field visit to the property

Annex V: Mission programme

Date	Time	Activities
9 December		Arriving in Dhaka
	15:30	Meeting with Power Division, Ministry of Power, Energy and Mineral Resources
10 December	11:00	Meeting at Ministry of Environment, Forests and Climate Change (Presentations from relevant ministries)
	14:00	Visit to the Memorial House
	16:30	Meeting at IUCN Bangladesh Office
11 December	09:40	Flight from Dhaka to Jeshore
	10:20	Arrival in Jeshore – travel to Mongla Port by car
	14:00	Arrival at Mongla Port – travel Passur and Sela Rivers by boat down to the southern tip of the Sundarbans East Wildlife Sanctuary (WH)
	18:00	Presentations and discussion (staying overnight on the boat)
12 December	06:30	Field visit in Katka, SEWS (on foot)
	09:30	Field visit in Jmtala, SEWS (on foot)
		Discussions and review of reports on the boat
	16:15	Field visit in Kokilmoni, newly expanded Wildlife Sanctuary (by boat)
	18:30	Presentations and discussion
	20:00	Field visit in Kokilmoni (on foot) (staying overnight on the boat – travel to Hiron Point, South Wildlife Sanctuary)
13 December	06:30	Field visit in Nilkomol and Keorashuti, SSWS (on foot and by boat)
		Travel up through Passur River
	15:00	Field visit in Harbaria, Sundarbans Reserved Forest (on foot)
	19:00	Arrival in Mongla Port (staying overnight in Mongla Port Guest House)
14 December	10:30	Travel from Mongla to Rampal
	11:00	Stakeholders meeting and field visit at Rampal Power Plant
	15:30	Travel from Rampal to Jeshore
	19:55	Flight from Jeshore to Dhaka (delayed)
	22:00	Arrival in Dhaka
15 December	09:45	Meeting with the Chief Conservator, Department of Forest
	10:00	Meeting with civil society together with government officials (BFD)
	11:00	Meeting with the India-Bangladesh Joint Working Group on the Sundarbans (BFD)
	11:30	Meeting on SEA with CEGIS (contracting company) and government officials (BFD)
	14:30	Debriefing meeting at Department of Environment
	16:00	Meeting with the Advisor to the Prime Minister
	19:00	Meeting among the RMM team
16 December		Departure from Bangladesh

Annex VI: List and contact details of people met

Meeting at Ministry of Power, Energy and Mineral Resources (9 December)



Name	Organization
MOHAMMAD MONIR HOSSAIN	EXECUTIVE ENGINEER
MD. MOFIJUL ISLAM	CHIEF PROCUREMENT OFFICER (CPO)
Khondkar Azizur Rahman	CONSULTANT BPDB
DILIP SINGH	BIFPCL
RAVINDRA KUMAR	BIFPCL
S. C PANDEY	BIFPCL
MD. ABDUS SABUR	RPCL
MD. NURUL ALAM	Power Division
Mohammad Hossain	Power Cell
KHALED MAHMOOD	BPDB

Meeting at Ministry of Environment, Forestry and Climate Change (10 December)

No.	Name, Designation & Office address
1.	MAHMUD HASSAN Additional Secretary, MoEF&C
2.	Elena Osipova Senior Monitoring Officer IUCN
3.	Akane Nakamura UNESCO World Heritage Centre
4.	Guy Brasseur UNESCO New Delhi Office Head, Science
5.	ANDREW WYATT DEPUTY HEAD IBC IUCN ASIA
6.	Zahir Uddin Ahmed DCCF (Ex)
7.	Md. Amir Hosain Chowdhury DCCF, BFD.
8.	Md. Mizanur Rahman Superintending Engineer BWTA
9.	Syed Nazmul Ahsan Director (E.C) DOE
10.	Subhash Chandra Pandey Proj. Director - BIPPEL
11.	MD. MOFIJUL ISLAM Chief Procurement Officer (CPO)
12.	Ravindra Kumar Chief Technical officer BIFPCL - Maitree Project, Rampal
13.	Md. Mafaha Hossain Joint Secretary MoWR
14.	Dr. Fahmida Khanam Director (NRM) Department of Environment
15.	Anifa Afrin Assistant Secretary (UN) Ministry of Foreign Affairs.
16.	Dr. Md. Ashfaqul I. Rabbee Joint Secretary, MoEFCC
17.	Dr. Mallick Anwar Hossain Additional Director General
18.	Lakt Md Ali Member, MPA
19.	Abdus Sattar Shaikh Joint Secretary Ministry of Shipping
20.	Keya Khasy Joint Secretary MOEFCC
21.	Mohammed Hossain DG, Power Cell
22.	Md. Shahid Alam CCF, FD
23.	Elena Osipova IUCN
24.	Md. Monsur Alam Deputy Secretary MoEFCC
25.	MD. SHARIF HOSSAN, DIRECTOR BARISAL ELECTRIC POWER COMPANY LIMITED, BANANI, DHAKA
26.	Md. Shamsul Alam, Sr. AGM, Barisal Electric power co. Ltd Banani, Dhaka.
27.	Md. Nazmul Islam Deputy Secretary MoEFCC

Field visit to the Sundarbans (11-13 December)

	Name	Affiliation
1	Md. Amir Hossain Choudhury	Deputy Chief Conservator of Forest, BFD
2	Zahir Uddin Ahmed	Former Deputy Chief Conservator of Forest, BFD
3	Dipak Kumar Chakraborty	Deputy Secretary of MoEFCC
4	Md. Saiful Islam	Deputy Secretary, Ministry of Shipping
5	Mahmud Hasan	Deputy Secretary, Ministry of Water Resources
6	Fahmida Khanom	Director, DoE
7	Md. Moyeenuddin Khan	Conservator of Forest, Khulna, BFD
8	Md. Bashirul Al Mamun	DFO-Sundarbans West
9	Md. Mahmudul Hassan	DFO-Sundarbans East
10	Md. Modinul Ahsan	DFO, BFD
11	Mallick Anowar Hossain	Additional Director General, DoE
12	Md. Mehedi Hasan Khan	Wildlife & Biodiversity Conservation Officer, BFD

Stakeholder meeting in Rampal (14 December)

Name (Mr)	Organization
Mohammad Hossain	DG, Power Cell
MD NURUL ALAM	Joint Secretary Power Div.
Dr. Mallick Anowar Hossain	ADG, DOE
Md Mamunur Rashid	DC
Md. Amir Hossain Chowdhury	DCCF, BFD.
Dr. Fahmida Khanom	DOE
Saifur Rahman Khan	DOE
Md. Moyeen Uddin Khan	CF, BFD
DIPAK KR. CHAKRABORTY	DS, MOEFCC
D. K. Dakey	GM, Project, BIFPCL
Ravindra Kumar	BIFPCL
MD. AREFIN BADAL D. D	Department of Env.
Md. ALAMIN GAJI	BEDS
Burak GERMEZ	FICHTNER
JAGADISH NAYAK	FICHTNER
Gias uddin gazi	Chairman, Gouranbhe
Tapan Kumar Golder	Chairman, Huska Rampal, Bagerhat
Md. Saiful Alam	Social activist
Md. Bashirul Al Mamun	Forest Department
MD. Mahmudul Hasan	Forest Dept.
Mst. Rizia Parven	Rupantar
MD. ISRAFIL HOWLADER	CHAIRMAN Mongla
MD. Rahat Mannan	UNO, Mongla
MD. IQBAL Hossain	V.C.H. MONGLA

Name (Mr)	Organization
M. Maizur Kadir	SMKK
Md. Waliullah	SMKK
[illegible]	DC.D
Sahabuddin	DC.D
[illegible], [illegible]	DCT
[illegible]	CPG
Md Rashed Ali	CMC - Dakop-Kotta
MD. Asaduzzaman Fakir	CPG - Dakup-Kaira
Rudra Baishya	CPG - Dakup-Kayra
Shital Kumar Nath	CODEC
Sk. Mostafizur Rahman	Shushilan
Mallick Sudhangshu	Khulna TV Reporter
Md. Mozaedeel Islam	Shushilan
HN Pandey	BIFPCL
Pronab K. Halder	CEGIS
Ms Sharmila Sarkar	Dhanmari C.P.G

Meeting with civil society group at BFD (15 December)

Name & Designation	Office address		
Sultana Kamal		Maha Mirza	
S. RIZWANA HASAN		RUHIN HOSSAIN PRINCE	NCSS
Dr. M. Abdul Matin		CAPT MD ALI BN Member, MPA	MPA
M. M. Akash	Dhaka University Economics Deptt.	Syed Nazmul Ahsan Director	DOE
Shaheen Zaman	TIB	DIPAK KUMAR CHAKRABORTY	DG MoEFCC
Shaumen Huda	ALRD Asst. for Land Reform & Dev.	ANDREW WYATT DEPUTY HEAD - IBC IUCN ASIA	
TAZIMUDDIN KHAN	DEPT. OF I.C D.U		

Meeting with JWG at BFD (15 December)

Name & Designation	Office address
Subash ch. Saha Add. Div. com(R)	Divisional com. off. Khulna
Shahin Ara Begum DS. MoFL	MoFL
Dr. Mohammad Sayedur Rahman Senior Scientific officer	BDH
Dr. Shamol Chandra Das Director / Planning-1	BWDB Dhaka
Md. Mahmud Hasan Deputy Secretary	MoWR MoWR
Dr. ASM Helal Uddin Ahmmed Siddiqui Divisional officer	BFRI Khulna
A.M. Aminul Haque Addl. Director General (Planning), BWDB	Dhaka BWDB
Md. Mahmudur Rahman Director	Joint River Commission, Bangladesh

Md. Moyeen Uddin Khan CF, Khulna	Khulna circle, BFD.
Mihir Kumar Doe, CF	Wildlife Circle, FD
Dr. Fahmida Khanam Director	Department of Environment
Capt Md Ali Member, MPA	MPA
Md. Rahmat Ali Assistant Secretary	MoFA

M. M. Tarikul Islam Additional Secretary	MOS Bangladesh Secretariat
Kaziful Amin Country Representative	House-127 Road-12 Mohakhali DOHS

Debriefing meeting at DoE (15 December)

Name & Designation	Address
Rafique Ahammed	DG, DOE
M. M. Tazikul Islam	additional secretary, Ministry of shipping
Mohammad Hossain DG	Power Cell Power Div
Zahir Uddin Ahmed DCCF (Ex)	BFD
Capt Md Ali Member, MPA	MPA
Md. Amir Hosain Chowdhury, DCCF.	BFD.
Md. Zaheer Iqbal	BFD
MD Abdul Matin Sarker	BIWTA
NARESH ANAND DILIP SINGH	BIFPCL HQ DHAKA - Do -
DIPAK KUMAR CHAKRABORTY	MoEFCC
AKM Rafiqul Islam	DD, DoE
Md. Samsuzzaman Sarker AD	DoE, Dhaka
Syed Nazmul Ahsan Director	DOE
Rabina Siddiqui Director (Monitoring) DOE	DoE
Mohammad Asadul Hoque Director	DFE
Md Saidul Islam Director (Admin)	DoE
Dr. Fahmida Khanam Director NRM	DOE
Dr. Mashiur Anwar Hossain ADG	DOE
Md. Shafiul Alam Choy CCF	FD
Zacoula Afnan	DoE

Annex VII: Photographs

A meeting with concerned ministries

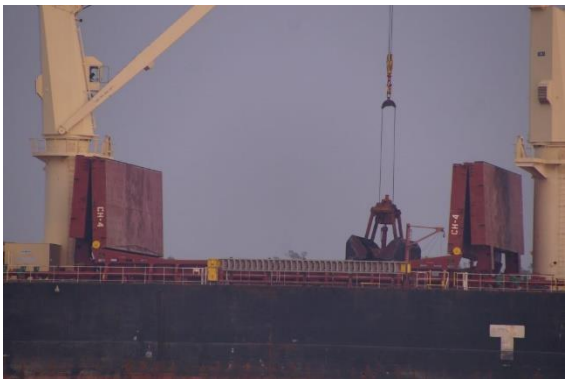
Discussion with site managers during the field visit

A macaque in the SEWS

Tiger paw print

Field visit to the SRF

World Heritage emblem in the SSWS

A vessel on Pashur River

Rapmal power plant construction site