Rampal Power Plant Vs Sundarban

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People in Bangladesh have been protesting heavily against the most controversial Rampal Power Plant for the last several months. Media, including social media, are being inundated with news on people's frustration and anger about the Government's hilarious decisions to install the coal-fired power plant near a world heritage site, Sundarban. For professional interest, I have been following the project progress to see how the environmental requirements of this sensitive site are met and get addressed.

Sundarbans Reserve Forest – a world heritage site

The Sundarbans Reserve Forest is the world largest mangrove forest and located in the south west of Bangladesh (Figure 1). It has been declared a Ramsar Site and Natural World Heritage Site by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 1997 due to its cultural or natural significance. This area spans the drainage basins of the Ganges, Brahmaputra and Meghna rivers and is intersected by a complex network of other rivers and waterways. It is one of the largest contiguous mangrove forests in the world (140,000 ha).

According to the World Heritage Council (WHC), the Sundarbans mangrove forest is the habitat of a wide range of flora; 334 flora species and 693 fauna species[1]. The bird-life found along the waterways of the site include 315 species of waterfowl, raptors and nine species of kingfisher, and the magnificent white-bellied sea eagle. The area is habitat for the Royal Bengal tiger and other threatened species, such as the estuarine crocodile and the Indian python. It is the only mangrove habitat in the world for the Royal Bengal Tiger. A population of between 400 to 450 tigers live there, which is a higher density than any other population of tigers in the world[1].

Figure 1 Location of the Sundarbans Mangrove Forest

Nonetheless, the area is critically important for the livelihoods of the people living in and around the forest area, protecting their communities from storm and tidal surges, and supporting fishing and farming.

1 United Nations Education, Science and Cultural Organisation website 7 August 2016
2 CEGIS Rampal Power Plant Environmental Impact Assessment 2013
3 http://ieefa.org/wp-content Risky and Over Subsidised A Financial Analysis of the Rampal Power Plant
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The proponent of the Rampal Power Plant

To meet electricity demand, the Government of Bangladesh has taken the initiative to install a new coal based thermal power plant, known as the Rampal Power Plant. It is also known as the Maitree Super Thermal Power Project, which is one of eleven coal-fired power stations the Bangladesh Power Development Board (BPDB) plans for commissioning by 2021. Under the Companies Act 1994, a joint venture company called the **Bangladesh-India Friendship Power Company Limited** (BIFPCL) was formed in January 2012 by BPDB and India's state-owned National Thermal Power Corp (NTPC). Bangladesh and India (50:50) will invest 30% of its total cost while the remaining 70% percent will be obtained through loans from external sources. The official estimate of the total capital cost of the project is US$1.82 billion[3].

The BIFPCL signed the agreement with India's state-run company **Bharat Heavy Electricals Limited** (BHEL) on 29 February 2016 to build the power plant and they have forty one months to complete the project. The project was originally expected to be awarded by early 2014 and completed by 2017, but the process was delayed as the joint venture company (BIFPCL) could not find any donors due to the project's high environmental concerns. Norway's state-owned Government Pension Fund Global was interested to invest TK.4,300 million (US$55 million) for the project. But, in the end, they could not manage approval from the Norway's Council on Ethics due to the threat to the Sundarbans and withdrew the fund. Despite the long protest this year to stop the Rampal coal plant and protecting the Sundarbans forest, on July 12 2016, a contract was signed to finally install the plant.

Rampal Power Plant Project

The power plant site is located under Rampal Upazila in the Bagerhat district. The Government has acquired 1,832 acres of agriculture and fish (shrimp) farming land from Sapmari Katakhali and Kaigar Daskati Mauza of Rajnagar to build the Rampal power plant (Figure 2). Only 86 acres of the land is the government's land, with the rest of the land being private land[2].

The power plant site is 14km away from the Sundarbans, and 70km away from the world heritage boundary[2] (Figure 2). The plant comprises of two unit steam turbines of 660MW each, two forced draft cooling tower stations of the wet type, a cooling water intake station at riverside

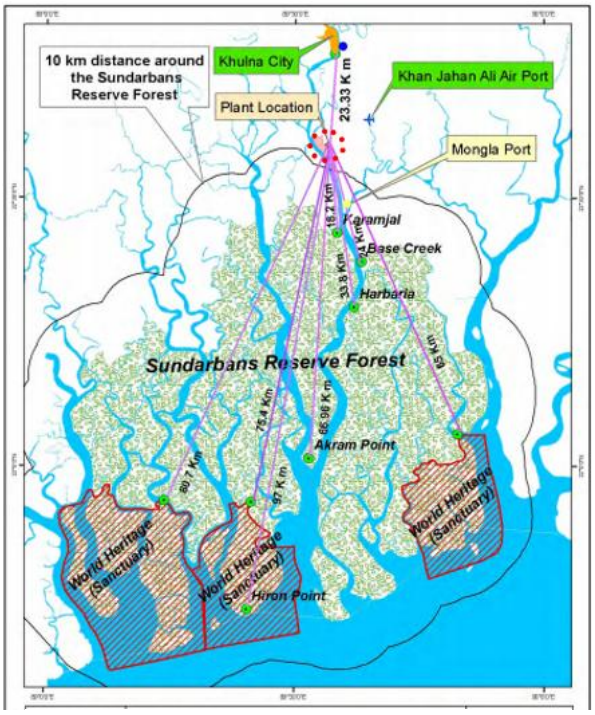

Figure 2 Location of the Rampal Power Plant [2]

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including proper intake piping and discharge channel, stacks of 275m each, a residential and social area, a water treatment plant, a sub-station, a coal terminal, a coal handling and coal silo, an ash disposal area, and a greenbelt.

How a coal based power plant works

A coal based power plant burns coal to produce steam. It requires tremendous pressure to flow the steam from the boiler into a turbine, which spins a generator to produce electricity. When the hot steam is cooled and turned into water, it is then returned to the boiler to start the process over. However, the system losses some water during the process. A typical diagram of a coal fired power plant is shown in Figure 3.

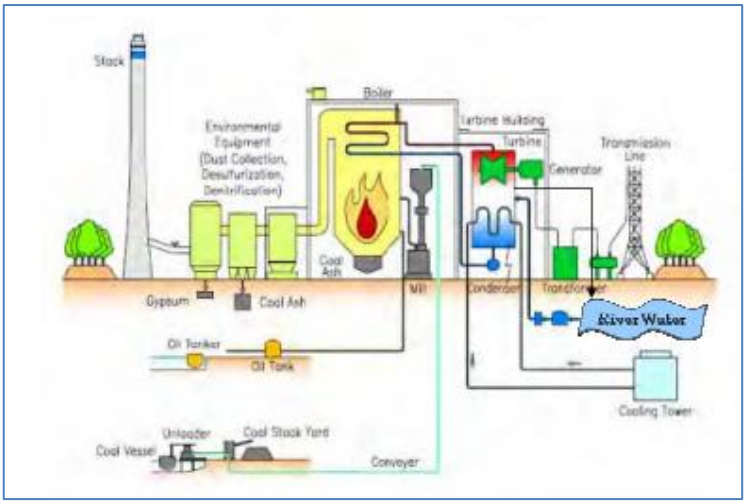

Figure 3 A diagram of a typical coal-fired power plant

In an average year, a typical coal plant generates approximately 3,700,000 tons of carbon dioxide (CO^2) - the equivalent of cutting down 161 million trees; 10,000 tons of sulfur dioxide (SO_2) - which causes acid rain; 500 tons of small airborne particles; 10,200 tons of nitrogen oxide (NO_x) - equivalent to emission from half a million old late-model cars; 720 tons of carbon monoxide (CO); 220 tons of hydrocarbons; 170 pounds of mercury; 225 pounds of arsenic; 114 pounds of lead; 4 pounds of cadmium; other toxic heavy metals; and trace amounts of uranium[4].

Why is it so controversial?

Local and international experts and environmentalists have raised their concern that the power plant activities could change the critical water balance in the Sundarbans region, pollute the surrounding water and air, and increase the risk of oil and coal spills. All of these could have an impact on the Sundarbans mangrove forest, and threaten the well-being of the people and animals who call that area home. The land owners are accusing the Government that they were not consulted before selecting the site for the power plant as agriculture and fishing is their main source of income. Therefore, as they have no other means to live their life, this project will heavily impact on their lifestyle.

The construction of the plant required raising the site elevation by 5 metres, which means in the event of extreme weather or when the sea levels rise, the site will remain at risk of flooding. Dredging activities for site development and the widening/deepening of the Passur River will increase water turbidity and can cause long-term impact on fish habitat. Clearing of the existing mangrove strip along the Passur River around the project site will also impact the flora habitat.

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Water from the Passur River will be used for circulating water systems (cooling, boiler, etc), domestic use and ash management. It is estimated that approximately 9,150m^3 of water will be withdrawn from the Passur River per hour and 5,150m^3 of warm water will be discharged into the river per hour. It has the potential to pollute the river water, pollute other water ways and kill fishes and animals.

The two supercritical units are estimated to burn 4.72 million tonnes of imported coal a year, which will generate approximate 0.3 million tonnes of ash and around 0.5 million tonnes of sludge and liquid waste[4]. All discharged gaseous pollutants through the stack will ultimately spread around the region and damage Sundarbans' ecosystem. Toxic substances in the operating waste can pollute drinking water supplies and subsequently harm human lives. Entire ecosystems can be damaged through the illegal or improper disposal of coal plant waste.

The proposed project could possess mechanical risk from the turbine and generator; electrical risk from the power transformer, switchyard, 400KV & 230KV switchyard control room, and 400KV & 230KV transmission line; risk of fire and explosion from the boiler, live steam line, and fuel stockpile; risk of toxic/carcinogenic chemical exposure from chemical storage; and, accidental discharge of sulfuric acid from the SO_x absorber.

Figure 4 Oil spill cleaning in Sundarban

The coal will be transported through Mongla port and the Passur River, as stated in the project's environmental impact assessment[2]. However the coal source and shipping arrangement is not adequately addressed in it. The sulphur from the burning coal can cause impact on human health. In addition, people are worried about the possibility of spills as the coal is being transported through the region's waterways to the plant's construction site. The region already experienced one such disaster two years ago, when an oil tanker collided with another vessel in the Shela River, spilling tens of thousands of gallons of oil into the water and threatening the habitat of the rare Irrawaddy and Ganges dolphins and other wildlife in the area.

The recent capsizing of a coal carrying ship in the Sundarbans has raised the question on the assessment being carried out by UNESCO on the Rampal power plant, as it has the potential to cause serious impact to this UNESCO World Heritage

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site. Some environmental groups have submitted petition to the UNESCO asking that the Sundarbans be placed on the official List of World Heritage in Danger.

People think the contract for the power plant is non-transparent and unequal; many alleged that the Indian government will be more benefited than Bangladesh. It looks like the Bangladeshi Government is not looking after its people's interest. The project is objected by people from different corners of both India and Bangladesh. Despite the valuable criticism of environmentalists, the Bangladesh government continues to back the construction of the power plant in Rampal.

Bank Track, a Netherlands-based coalition of organisations said that the Rampal project poses significant adverse social and environmental risks and impacts that are diverse and irreversible. We would like to request the UNESCO to investigate this matter and take a greater role in stopping the project in Rampal and save the world heritage site in Sundarbans.

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