

University of Asia Pacific
Department of Civil Engineering
Final Examination Spring 2013
Program: B.Sc. Engineering (Civil)

Course Title: Environmental Engineering VII
Time: 2 hours

Course Code: CE439
Full marks: 100

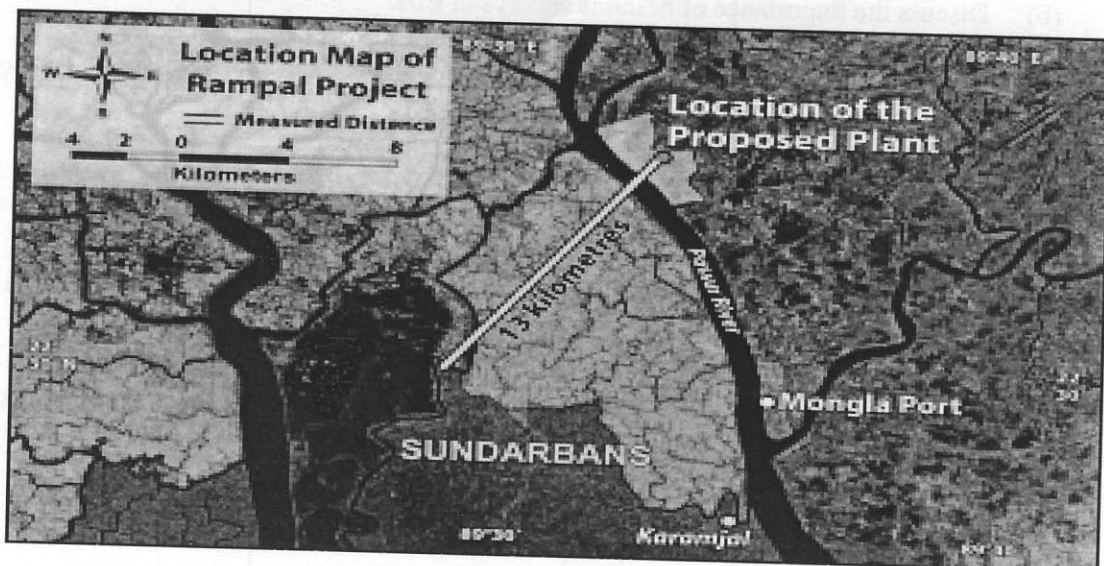
Question No. 5 is compulsory. Answer THREE from the rest.
(Note: Assume any missing data)

1. (a) Explain Environmental Management Plan (EMP) in EIA and write down the purpose of implementing EMP in EIA. (8)
- (b) Why public involvement is most significant part in EIA? What are the participation methods has been practiced in Bangladesh? (10)
- (c) Prepare an environmental Monitoring plan with the examples of air quality and flora & fauna at construction stage of a project. (7)
2. (a) Draw and discuss the flow chart of EIA process. (15)
- (b) Why Environmental legislation has been implemented poorly in developing countries and how this situation can be improved? (5)
- (c) Write down the obstacles in EIA implementation. (5)
3. (a) Briefly discuss the environmental clearance procedures for Green, Orange-A, Orange-B and Red Categories project in Bangladesh. (11)
- (b) Discuss the importance of baseline surveys in EIA. (4)
- (c) Categorize the following project into green, orange-A, orange-B and red category projects according to the Environment Conservation Rules, 1997. (10)
 - I. Photography (movie and x-ray excluded).
 - II. Sports goods (excluding plastic made items).
 - III. Medical and surgical instrument (excluding production).
 - IV. Dairy Farm, 10 (ten) cattle heads or below in urban areas and 25 cattle heads or below in rural areas.
 - V. Restaurant.
 - VI. Production of gold ornaments. Hazardous waste storage, treatment and disposal site including hazardous waste
 - VII. Hotel, multi-storied commercial & apartment building.
 - VIII. Animal feed.

- IX. Power plant.
- X. Explosives.

4. (a) Define “ecologically critical areas”. What are the “ecologically critical areas” in Bangladesh (7)
has already been declared by the Ministry of Environment and Forest (MOEF) ?
- (b) Prepare a template for impact identification for three stages of construction. The affected (18)
environmental component due to implementation of a road in a district will be occurred as
following:
Air, land, noise, vibration, flora, fauna and workers health and safety.
5. (a) Read the following description of Rampal Power Plant carefully and enlighten all the (25)
adverse impacts of the plant & also specify the types of impact beside all adverse impacts.

Bangladesh Power Development Board (BPDB) and National Thermal Power Corporation (NTPC) of India signed a Contract to build the 1320 MW Rampal Coal Fired Power Plant at Bagerhat under joint venture. Rampal power plant is considered as Bangladesh-India Friendship Power project and it promises to be the largest power plant in Bangladesh built on 1,834 acres of land, located 14-km north of the Sundarbans, the world's largest mangrove forest. EIA report by Bangladesh DoE states that a radius of 10 kilometres from the Sunderbans is considered the Environmentally Critical Area (ECA) and the proposed spot for the plant is 14 kilometres away from the forest, making the plant not risky as it is 4 kilometres away from the Sunderbans’ ECA. But the findings through Geographical Information System (GIS) software exhibit that this distance is between 9 and 13 kilometres.



[Fig: Location map of Rampal Coal Based Thermal Electricity Plant showing distance from Sundarbans]

The 1,834 acres of acquired land significantly consist of farming lands, fisheries and habitations of the population dependent on the mentioned. Over 95 % of the allocated land is capable of being harvested thrice a year that every year produced 1,285 tons of rice and 561.41 metric tons of fish. Over 8,000 families are permanent residents of the allocated land and among them 7,500 families live on the mentioned farming and fisheries. Therefore these families will lose their homes and incomes.

The EIA report by the Bangladesh DoE lists a number of damages to be caused at the development stage of the power plant infrastructure. They are- increased maritime transports, undue chemical discharges from the naval vehicles, sound and light pollution etc., which will potentially disturb the natural habitats of the local rivers and canals. It will hamper the ecosystem which comprises of Royal Bengal Tigers, deer, dolphins and the forestry. Again, deforestation and dredging that would be done to facilitate the increased transportation will also harm the local environment.

According to the EIA report, 4.72 million tons of coal will be burnt to produce the estimated 1,320 megawatt of electricity at the proposed Rampal power plant which will produce 7.9 million tons of carbon dioxide. In addition to carbon dioxide, the plant will release 142 tons of sulphur dioxide and 85 tons of nitrogen dioxide every day, amounting at 51,830 tons and 31,025 tons respectively in a year. As a result, the natural density of sulphur dioxide and nitrogen dioxide in the Sunderbans will rise at many folds, which will trigger the eventual destruction of the forest.

As a result of burning 4.72 million tons of coal per year, 750,000 tons of fly ash and 200,000 tons of bottom ash will be produced. These wastes, comprising of fly ash, bottom ash and liquid ash, are extremely hazardous. They contain hazardous and radioactive metals like arsenic, lead, mercury, nickel, vanadium, beryllium, barium, cadmium, chromium, selenium and radium. There may be a great risk if some of fly ash will be released in and around the Sunderbans by the Rampal plant, which would not only fatally affect the forest, but also cause a range of lung diseases including pneumonia to the people living nearby.

Again, the EIA states that the plant, for rotation of turbines and to use as a coolant, would require extracting 9,150 cubic metre of water per hour from the Passur River adjacent to the Sunderbans and would release back 5,150 cubic metre of water, implying that the ultimate extraction of water from the river would be 4,000 cubic metre per hour. This loss of water would impact the salinity, flow, tidal patterns, habitats and ecosystem of the river.

Another factor is that temperature of the plant's gaseous discharge, released in the atmosphere from a 275-metre high chimney, will be 125 degree Celsius which would indeed raise the surrounding atmospheric temperature of the area.

It is not disagreed that the demand of energy is spiraling in proportion to the paces of industrialization and population growth. At the circumstance, it is imperative that before going for environmentally risky projects we must consider the alternative sources.