

CHAPTER 1 INTRODUCTION

1.1 Background

TATA Power Company (TPC) proposes to set up a coal based thermal power plant having capacity of 1000 MW near Naraj Marthapur, Cuttack Sadar Tehsil, Cuttack District in the state of Orissa. The proposed power plant will comprise of the boiler-generator configuration of 2X125 MW+ 2X125 MW + 2X250 MW with an ultimate capacity of 1000 MW.

TPC was established in 1915. It is the pioneer in the generation of electricity in India and is the largest Private Sector Integrated Utility in the country having approximately 2300 MW capacity with presence in Generation, Transmission, and Distribution. TPC has a presence in all areas of the power sector including thermal, hydro, solar, wind, transmission and distribution.

Tata Power owns, operates and maintains thermal power plants in several Indian states, including Maharashtra, Karnataka and Jharkhand. It provides reliable and economic power supply to the city of Mumbai, the commercial capital of India. It is now also present in distribution in the national capital Delhi since 2002 catering to 8 lakhs consumers through a Joint Venture Company, North Delhi Power Limited (NDPL). **Table 1.1** shows the generation Capacity of TPC.

**Table 1.1
Generation Capacity of TPC**

Plant		Total
	Thermal	1838.8
Trombay	1330	
Jojobera	427.5	
Belgaum	81.3	
	Hydro	447
	Wind	17
Total		2302.8

1.2 Purpose of the report

Concern for environment is now a primary issue in all aspects of human activities. Human activities, knowingly or unknowingly have caused impacts on air, water, land and ecology for many years. It is therefore time to review all our activities from environmental aspects so that environment around us is not impacted to cause harm to anyone. It is therefore very important to assess the impact on environment of our activities, present or future.

In case of any new project, it may cause different types of impacts on its surrounding environment and on human beings. Therefore there are some statutory obligations that any project proponent has to fulfil before proceeding with any developmental work. With this view to assess the impact and to ensure environmental quality; environmental impact assessment is a very necessary exercise. The present Environmental Impact Assessment Report has thus been prepared in line with the Terms of Reference (TOR) issued by Ministry of Environment & Forest (MoEF) to assess the probable environmental impact due to the proposed 1000 MW coal-based thermal power plant at village Naraj Marthapur near Cuttack in Orissa.

Any new project or activities requires the prior environmental clearance from the Central Government or as the case may be, by the State Level Environment Impact Assessment Authority. By a new notification dated 14 September, 2006, Ministry of Environment & Forest, Government of India, has broadly categorised the projects and activities in two categories - Category A and Category B, based on the spatial extent of potential impacts and potential impacts on human health and natural and man made resources. The proposed project falls under category A which shall require prior environmental clearance from the Ministry of Environment and Forests (MoEF). For obtaining the said clearance, an Environment Impact Assessment (EIA) Report in respect of the project or activity addressing all relevant environmental concerns needs to be prepared. As per the new notification mentioned above, the EIA needs to be prepared as per the TOR issued by MoEF. This project of TPC was considered in the MoEF's Expert Appraisal Committee on 7 May 2007 and TOR was issued on 5 June 2007.

1.3 Importance of the Project and its Brief Outline

Power is the need of time, which has been recognized by development planner. In view of this Government of India has envisaged capacity addition of 100,000 MW by 2012 to meet its Mission of Power to All. Achievement of this target also requires the development of large capacity projects at the national and state level. Considering this fact, Ministry of Power (MOP) had taken initiatives in 1995 to enhance the electric power generation. Through these initiatives, several new projects have been identified to bridge gap between demand and availability. There could still be a short fall in available power and energy due to the increased power demand. Government of Orissa (GoO) has invited leading power producers in India for setting up power projects in the state and signed MoU with TPC on September 26, 2006

With this background, TATA Power Company (TPC) proposes to set up a coal based thermal power plant having capacity of 1000 MW near Naraj Marthapur, Cuttack. Of the total generation, 350 MW will be supplied to Tata Steel's plant at Kalinganagar, about 250 MW will be provided to GRIDCO, Orissa, the power distribution company of the Government of Orissa and remaining will be put up by TPC on merchant basis.

The proposed location for power plant is near Naraj Marthapur, Cuttack Sadar Tehsil, in Cuttack District of Orissa State. The area is about 990 acres. The power plant capacity has been proposed to be 1000 MW. The power plant site is located adjacent to an existing road connecting Khurda, Chandaka, Barang, Gobindapur, proposed site and Naraj villages. The site can be approached by road from Cuttack. Naraj Marthapur is a nearest railway station from the project site on Talcher- Khurda Road railway line of Eastern Railway. A summary of the project is given below in **Table 1.2**.

Figure 1.1 and **Figure 1.2** show the location of the project in the country, state and the district respectively.

Table 1.2
Summary of the Project

Location	At a distance of 12 Kms from Cuttack and 20 Kms from Bhubaneshwar in District Cuttack, Orissa Latitude 20°26'02" N - 20°27'43" N Longitude 85°45'28" E - 85°47'07" E
Proposed Capacity and Configuration	1000 MW 2 x 125 MW + 2 x 125 MW +2 x 250 MW
Fuel	Indian coal - Requirement 6 MTPA Source : Talcher Coal Field
Water	Requirement – 96,684 m ³ /day Source– Mahanadi River
Land	990 acres
Estimated Project Cost	Rs. 4,900 Crores

1.4 Scope of the study

The project outlines and the proposed Terms of Reference of the EIA study was presented to the Expert Appraisal Committee on 7 May 2007. The Committee through its letter dated 5 June 2007 has informed about the Terms of Reference for preparing the Draft EIA Report. The copy of the letter is annexed at the end of the chapter.

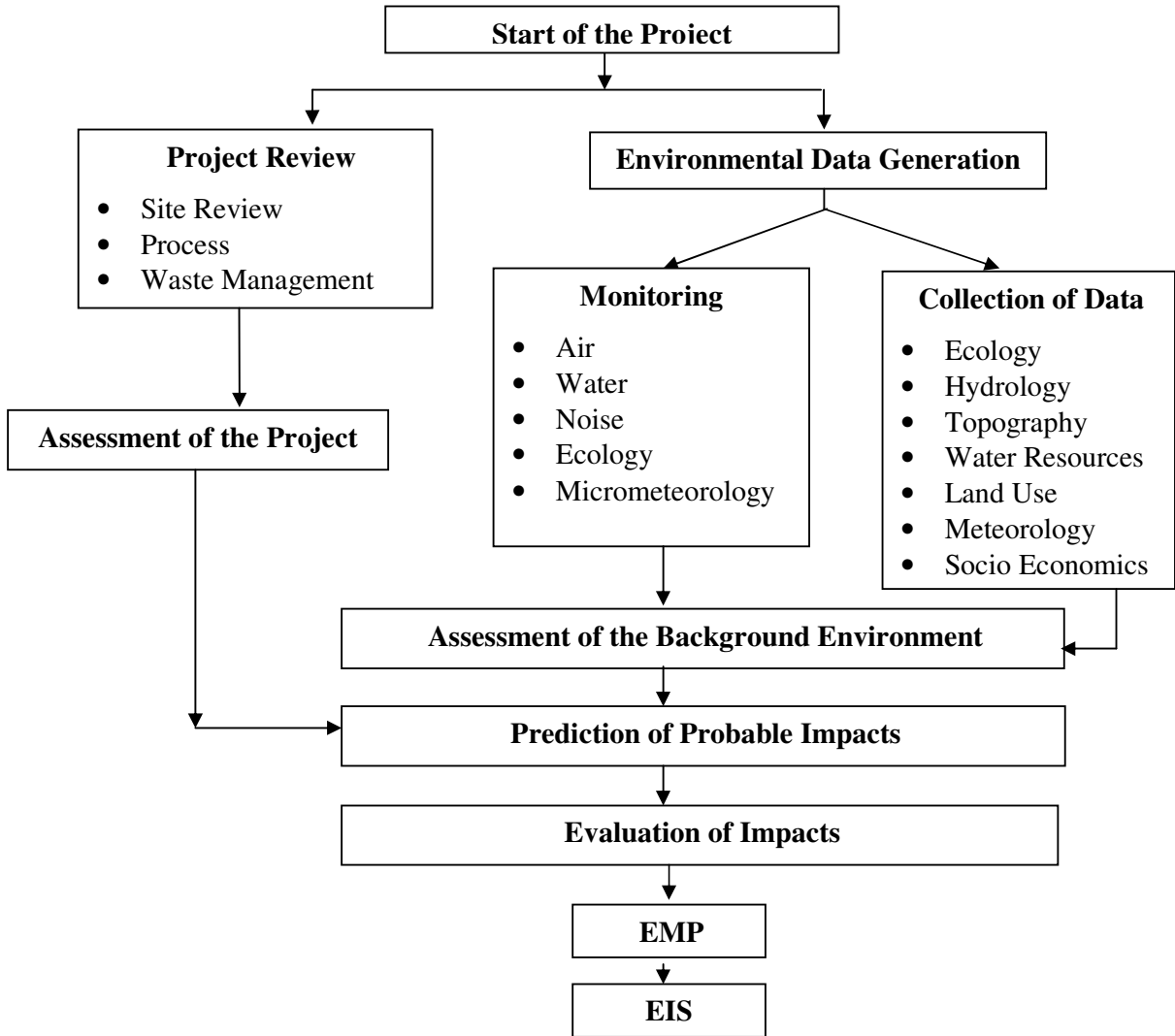
The scope includes literature review, field studies, impact assessment and preparation of the EIA Report covering the disciplines of Land Use, Water Use, Demography & Socio-economics, Geology, Soils, Water Quality, Meteorology, Air Quality, Terrestrial and Aquatic Ecology, Noise and Occupational Health and Safety.

The EIA study comprises of the following stages. **Figure 1.3** shows the steps in EIA study.

Stage 'A'	Determination of baseline conditions.
Stage 'B'	Assessing the impacts on the environment due to the construction and operation of the power plant and recommendations on preventive measures to be taken to minimize the impact on the environment to acceptable levels. A suitable post-study monitoring program will be out-lined.
Stage 'C'	Preparation of EIA document.

Figure 1.3

Route Map Environmental Impact Assessment



An outline of the activities to be undertaken for each stage is given below:

STAGE 'A': Determination of Baseline Conditions;

The core area for the study covers an area within 10-km radius around the project site. The suitability of sites (plant, ash disposal areas and associated facilities) is examined as per Ministry of Environment and Forests notification and its subsequent amendments. The legal policy and administrative framework within which EIA is prepared will be included in the report.

Project Description:

Concise description of the project's environmental, engineering and geography features including any offsite facility that may be required will be covered in this section.

Data on the land requirement, forest land involved, number of families, if likely to be affected and number of homestead oustees due to land acquisition need to be reported.

Baseline Data:

The baseline environmental conditions are established through literature survey and field studies/monitoring. In addition, information on the location of metropolitan cities, national parks, wildlife sanctuaries and ecologically sensitive areas like tropical forests, important lakes, biosphere reserves, ecological resources within a 10 km. radius of the plant will be furnished. Places of archaeological, historical/ cultural/religious/tourist interests, defence installations, etc. within a radius of 10 km from the site will also be identified. All the above information should be presented on maps.

The duration of field monitoring will be for one complete season. For present study the field monitoring was carried out for the month of March, April and May (summer season). Data will be sufficient to develop a clear understanding of the nature and magnitude of potential impacts of the project.

Following studies were carried out. **Table 1.3** shows the summary of baseline data collection schedule

Table 1.3
Baseline Study Data Collection

Field	Parameters	No. Locations	Frequency	Brief Sampling Specifications
Ambient air quality	SO2 NOX SPM RPM	8	Twice a week, every month of summer season	24 hour samples at each location using High Volume Sampler
Meteorology	Wind speed & direction, Temperature, Humidity, Pressure, Rainfall	1	Hourly interval during study season	A permanent meteorological station is to be established
Surface Water quality	Physical, chemical & biological parameters:	6	Once in every month	
Ground Water quality	IS -10500	4	Once in every month	
Noise	Leq, Lmax	10	Once in a season	24 hourly sampling locations using an integrating sound level meter
Soil	pH, conductivity, cation exchange capacity: N, P, K etc.	6	Once in every month	

Land Use:

The present land use pattern is established through literature review and field studies. Satellite images obtained from National Remote Sensing Authority (NRSA), Government of India is developed to prepare landuse map showing the agricultural land, settlements, forest area with canopy density, waterbodies etc.

Soils:

Significant Physico-chemical parameters of soil will be determined at the locations during monitoring season in the study area with respect to color, texture, soil type, pH, and conductivity, sodium absorption ratio (cation exchange capacity, N, p & K. The sampling locations for soil are to be judiciously chosen to represent the area characteristics

Water Quality (Surface and Ground):

The surface and ground water quality shall be monitored monthly during the monitoring season at minimum of 10 locations in order to characterize the water bodies with respect to physico-chemical characteristics and pollution levels. All relevant parameters for surface water and ground water will be monitored

Meteorology:

A fully instrumented continuous recording meteorological observation will be operated at the site for one complete season to measure the following parameters: temperature, barometric pressure relative humidity, wind speed and direction, & rain fall..

Air Quality:

A monitoring network for ambient air quality will be designed to characterize ambient air quality with respect to SO₂, NO_x, Suspended Particulate Matter (SPM) and Respirable Particulate Matter (RPM). Monitoring shall be conducted at a minimum of eight appropriate locations. At each location, 24 hour sample shall be undertaken twice a week for complete season. The monitoring location shall be selected based on meteorological conditions and sensitivity of the site.

Ecology:

The ecological study will aim to understand the 'state of health' of habitat at ecosystems such as degree of disturbance, presence of pollutants, nutrients and hazardous material. Type, locations and characteristics of important and sensitive,

flora and fauna will also be described. Study will be carried out by field observation and collection of data from forest offices etc.

Noise:

A noise monitoring survey which will produce sufficient baseline data to characterize the noise environment in the various zones of study area like Industrial, Commercial, Residential and Sensitive locations shall be undertaken. The survey has to be undertaken at all eight ambient air quality locations for once in a season and for 24 hours at each location. The equivalent continuous noise level (Leq) will be measured using an integrating sound level meter.

Socio-Economic Environment :

A socio-economic study covering land use pattern, demographic pattern, population density, agriculture, literacy, sex ratio, medical facilities, educational facilities, communication, places of historical interests etc. for the town and villages around the proposed site was done. The relevant data were collected from census handbooks and field surveying.

STAGE 'B': Impact Assessment:

Environmental Impact:

The features of the power plant and other industries which are likely to have impact on the environment shall be discussed in detail covering gaseous emission, liquid effluents, particulates, solid wastes, noise, etc. With knowledge of the baseline condition and plant characteristics, positive and negative impacts during the construction and operation phase will be identified and assessed. Impact of the stack emissions on terrestrial flora will be scientifically documented based upon species composition of the area and their air pollution levels.

The impact will be expressed through appropriate matrix. Special reference will be made with respect to following impacts.

Air Quality Impact:

A computer based internationally recognized mathematical air quality model (like ISC3 or other) will be identified and run to predict the concentration of SO₂, NO_x & SPM due to the operation of the power plant. The results will be presented for short term (24 hourly) concentrations over a radius of 10 km. around the plant. The dispersion model results will be included in the report using isopleths.

Water Quality Impact:

The impact of liquid effluents on natural water bodies receiving the effluents shall be established and significant parameters, which are likely to change critically, are to be clearly spelt out.

Impact on Ecology:

Impacts on aquatic species, will be assessed particularly those which are endangered. The parameters which are of concern are TSS, TDS, heavy metal, oil and greases, pH and temperature. This assessment will give priority to impact on endangered species, if any. Measures to mitigate such adverse impacts as soil erosion and habitat losses will be included in report.

Social Impacts:

The consultant will identify and prescribe in the EIA report mitigatory measures associated with the project's social impacts during its construction and operational phase. Some impacts are associated with the health, sanitation, security and housing needs of the workforce.

Disaster Management Plan and Occupational Safety:

A Disaster Management Plan (DMP) for dealing emergency situation in the plant is to be prepared. Occupational health involved during construction and- operation of the plant should be assessed and necessary safety and protective measures should be spelt out.

Green Belt Development Plan:

A green belt development plan for the project site should be included in the EIA report. Details such as areas to be planted, suitable plant species, plantation technique and necessary infrastructures required for plantation etc. should be clearly mentioned.

Post Study Monitoring Plan:

It is necessary to monitor certain environmental parameters identified as critical or as required by regulatory agencies. Considering the requirements of Regulatory Agencies and identified critical parameters, a post study environmental monitoring programme will be developed.

Environmental Management Plan:

At this stage, it may become apparent that the environmental management and pollution control measures will be necessary to meet the requirements of the regulatory agencies. Recommendation shall be made on mitigation measures as and where such measures are warranted. Environmental Management Plans shall be developed to selectively mitigate the adverse impacts of the power project activities. Recommendations shall be made concerning establishment of Environment Management Group and training of staff, wherever necessary.

STAGE 'C': EIA Report

This stage shall consist of preparation of an EIA Report covering all the above details for Public Consultation and Application to MOEF for Environmental Clearance.

The Report has been arranged in chapters following the 'Generic Structure Of Environmental Impact Assessment Document' as suggested in Appendix III in the said Notification.

-----00000-----