



ENVIRONMENTAL
FOUNDATION
(GUARANTEE) LIMITED

CASE STUDY:

The Lakwijaya Coal Power Plant



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OVERVIEW

The Norochcholai Coal Power Plant was first commissioned in the late 1980's but was not carried forward due to widespread opposition. The official EIA report for the first phase of the project (300MW) was done in 1998. In 2005 negotiations were restarted by Former President Rajapakse and the contract was signed in 2006. The construction cost was estimated to be \$1.35 billion of which \$450 million has been granted on a long term, low interest rate loan by the EXIM Bank of the Republic of China. Construction was undertaken by CMEC (China Machinery Engineering Corporation).

1. Project Developer

Ceylon Electricity Board

2. Project Capacity

900MW

3. Project Status

Completed

4. Project Clearance

Department of Coast Conservation

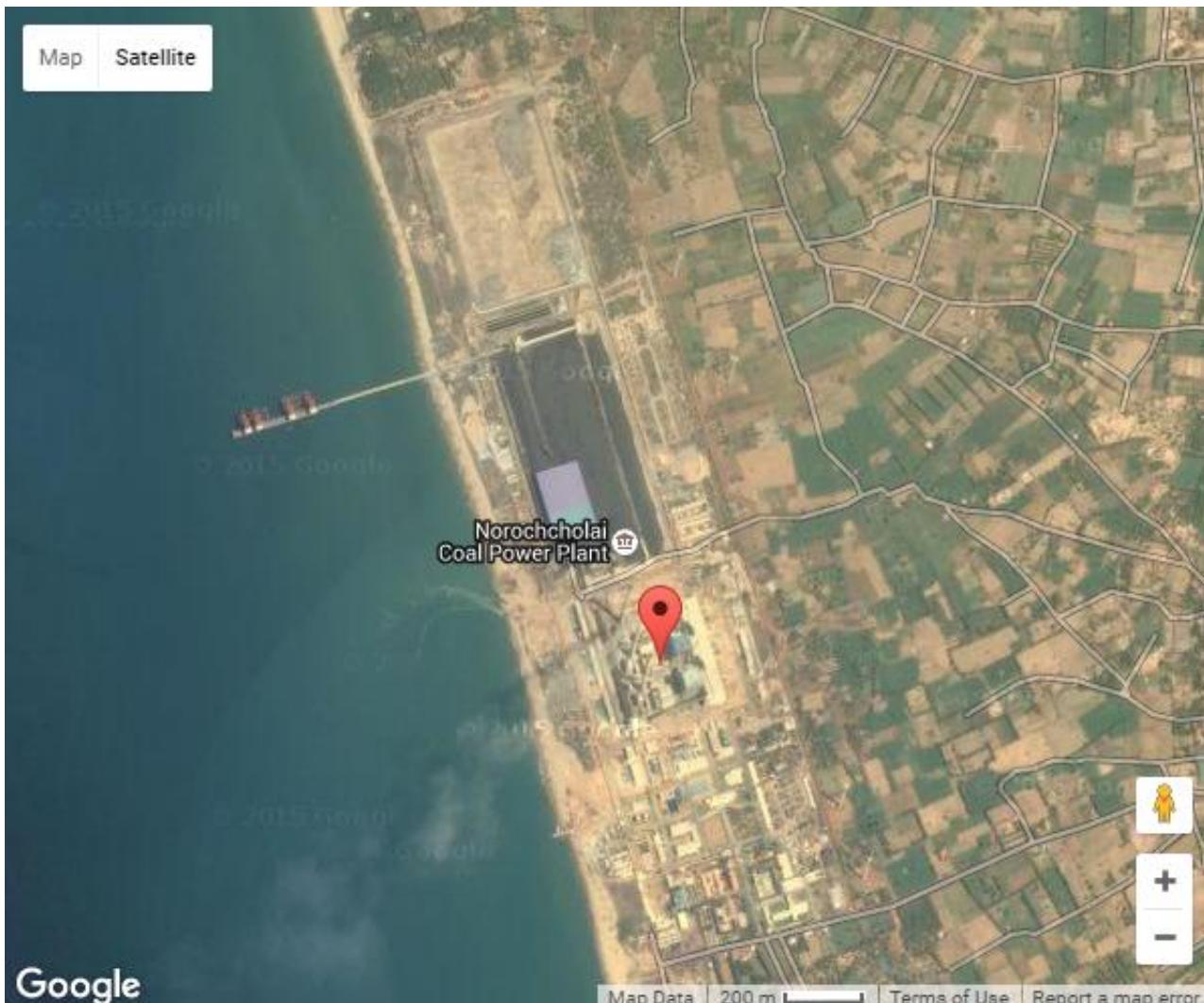
Other agencies/ scoping committee include:

- Geological Survey and Mines Bureau
- Urban Development Authority (UDA)
- Marine Pollution Prevention Authority (MPPA)
- Department of Fisheries and Aquatic Resources
- Central Environmental Authority (CEA) – issuance of EPL
- North Western Provincial Environmental Authority (NWPEA)

The plant was constructed in three phases:

Phase I	-	300MW (completed on 22 March 2011)
Phase	II	300MW(completed on Sept. 16 th 2014)
-		
Total	Capacity	900MW
-		

Phase I also included the construction of a 115km long transmission line to the Veyangoda substation to connect to the national grid. Additionally, a jetty extending 4.2km seawards (not including the 15m bathymetric contour) was constructed. The first phase of the power plant was estimated to generate 2000GWh of electrical energy annually.



Location

The plant is located approximately 100m inland from the shoreline near the villages of Narakkalli and Penaiyadi on the Kalpititya peninsula in the Puttalam district of the North Western Province.

Geographical Coordinates: 8° 02' N 79° 43' E

General Impacts of Coal Power Plants

- I. Water is used in the power plant for the cooling system, in the treatment of ash or in the flue gas cleaning system, which contribute to the depletion of water resources in the area and decline in water quality.

“A typical coal plant with a once-through cooling system withdraws between 70 and 180 billion gallons of water per year”

- Union of Concerned Scientists

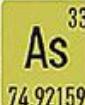
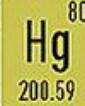
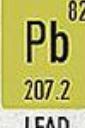
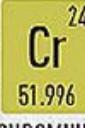
The extraction of water from nearby water bodies risk damage to marine life by destroying marine fish eggs, larvae and small organisms.

- II. The sulphur released during the burning of coal in combination with nitrogen can cause acid rain. These elements as well as particulate matter or fly ash can cause major respiratory problems.

- III. Mercury from coal fired plants can cause brain damage and heart problems.

IV. Other pollutants include,

- Lead, cadmium and other toxic heavy metals
- Carbon monoxide
- Hydrocarbons
- Arsenic

COAL ASH POLLUTANT	HEALTH IMPACTS					
	INGESTION		INHALATION	ABSORPTION		
 ARSENIC	 nervous system damage	 cardiovascular issues	 urinary tract cancers	 lung cancer	 skin cancer	
 MERCURY	EXPOSURE					
	 POSES PARTICULAR RISK TO CHILDREN INFANTS, AND FETUSES	 nervous system damage	 developmental defects like reduced IQ and mental retardation			
 LEAD	EXPOSURE					
	 THERE IS NO SAFE LEVEL OF LEAD EXPOSURE, PARTICULARLY FOR CHILDREN	 kidney disease	 cardiovascular problems	 nervous system damage	 death	
 CHROMIUM	INGESTION		FREQUENT INHALATION			
	 stomach ulcers	 intestinal ulcers	 stomach cancer	 asthma	 wheezing	 lung cancer

V. The publication “Environmental and Health Impacts of Electricity Generation (2002)” by the International Energy Agency refer to the following impacts arising from coal power generation:

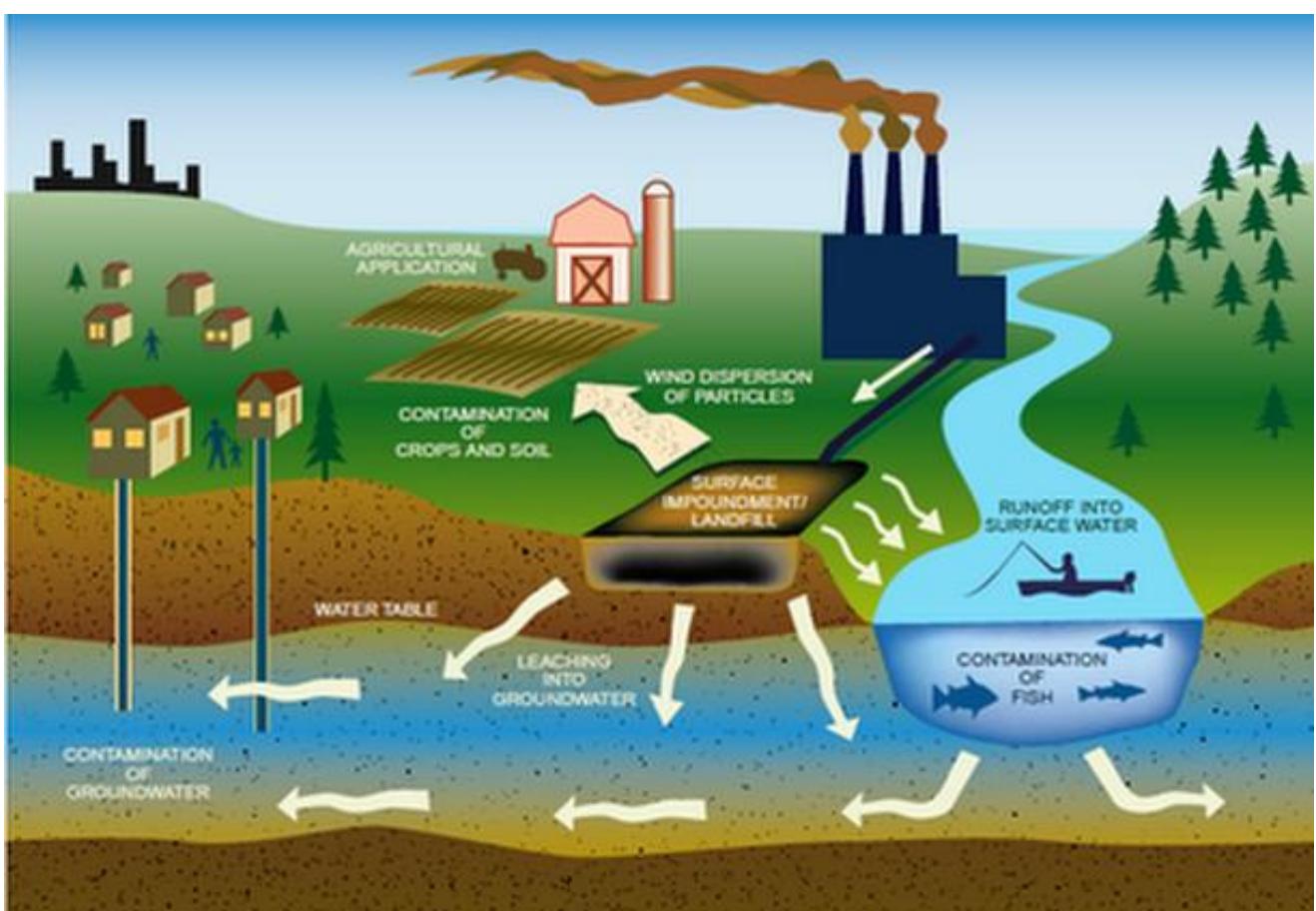
- Large amounts of methane are released during hard coal mining. Emissions also occur during fuel transport.

“Coal power life cycles lead to larger emissions of greenhouse gases (GHG) than any other electricity generation option”

- The social and socio economic impacts of coal include resettlement due to the large area of land necessary for coal power plants and cultural effects due to the change in livelihoods of people living around such plants.

- The emissions from coal power plants can cause major problems to the environmental balance of the surrounding region.

“Some substances such as mercury and other heavy metals can accumulate in food chains”



ANALYSIS

The picture of a better future has long faded, five years after operations at Lakwijaya began. Today the environmental, social and cultural impacts of the power plant have exceeded all expectations and the long term consequences of this plant are already being felt by the people of Norochcholai and its surrounding villages. The following are the impacts observed at the power plant and facts from interviews with the residents of the area who continue to lead their lives amidst these issues.



Environmental Impacts

- The coal supply is stored outside in the open on 1 ft. – 1 ½ ft layer of gravel with a particle size of approx. 1inch – 1 ½ inches. Ground water contamination is a possibility due to improper storage of coal. Fencing should be done to prevent coal dust being carried away by the wind.
- For 6 months of the year (April – August), with the onset of the South West monsoon, the wind brings coal dust and fly ash towards the landside, blackening agricultural fields, homes, coconut trees, etc. May is known to be the worst month during this period.
- Ash is carried up to 2km away from the plant.
- Heated water from the plant is directly released approx. 5km away into the sea. This has affected the lagoons around the area in which prawns can no longer be found according to fisherman.
- Increase in temperature of the surrounding area when burning takes place at the plant. Carbon monoxide emissions and other greenhouse gases associated with coal combustion are contributing to the rise in temperatures.
- The plant is 100m -200m away from the seashore and the coast line has eroded. The jetty used to unload coal has affected the wave patterns which have contributes to coastal erosion and changes in fish habitats, etc.
- Heated water released by the plant has destroyed the fish populations and habitats.
- The water intake causes large fish to get stuck in filters and die while larvae and eggs are destroyed.

- Green water (pollutants, oil, etc.) is sometimes seen released into the sea from the pipeline leading water out of the plant.

Social Impacts

- Water board report shows that the water quality is not suitable for drinking. Nitrates due to agriculture have also contributed to loss of water quality. The people have long stopped using the groundwater.
- 15 families reside in close vicinity to the plant. Most farmers come to work in the fields and leave in the evening.
- Women between the age of 20 - 45 years often work in the nearby fields and the radiation and ash from the plant is a health hazard and can cause complications during child birth, posing a risk to the future generations of this region.
- Respiratory issues and eye irritation have been noted in people living in the region.
- Residents complain that their children come home covered in ash after school and the ash has been deposited in every corner of their homes. They are unable to dry their clothes and are obstructed in their daily activities.
- Fly ash contains fine particles below PM 2.5, these could enter lungs and cause Chronic Obstructive Pulmonary Diseases (COPD) as well.



Economic Impacts

- Before the power plant was established the CEB had promised free electricity, new school buildings, paved roadways and many other facilities, these promises have not been fulfilled thus far. Families living within 100m of the plant have no access to electricity.
- The sprinklers in agricultural lands dilute the ash and dust causing damage to crops and 22 farmers have been compensated by the CEB for the loss of agricultural livelihood in recent years.
- Problems have arisen in growing coconut due to the ash which is deposited on the trees, burning the leaves and killing the trees.
- The population in the area has decreased as people have sold their land and moved elsewhere due to the effects of the plant,
- Areas previously available for fishing are not so anymore. This has had a heavy impact on the livelihoods of the people. Within years of the plant's operation the problem has escalated.

- Fisherman can no longer fish due to the control their traditional fishing areas by the navy. The few areas available no longer provides enough catch to sustain their daily income.
- Dolphin viewing is a popular attraction in the region. The impacts of the plant on the marine life has affected the tourism and livelihoods dependent on this trade.



In addition to the above the Lakwijaya power plant has faced a number of technical issues over the years.

“The Norochcholai coal power plant has broken down on 12 occasions since its commissioning on March 22, 2011.

Amongst the breakdowns, there have been five major breakdowns that have lasted for over 100 hours and in some instances resulting in power cuts.

Following is the list of large-scale breakdowns of the plant:

September 28, 2011 (Problem in the turbine system valve)

– 593 hours

January 5, 2012 (Coal mill fire) – 122 hours

January 18, 2012 (Technical issue) – 702 hours

July 21, 2012 (Leaking of a boiler) – 114.8 hours

August 9, 2012 (Tripping of high tension transmission wire)

– Ongoing

The other seven breakdowns have been less than 100 hours.”

- Extract from “Norochcholai Always Breakdown CEB Loses 6.5 Billion Rupees and Counting”, Sunday Leader

Since then the Lakwijaya power plant has had two more failures.

- On January 29th 2013, power station exceeded its designed capacity of 300MW causing a complete shutdown and was re activated within 24 hours.
- On 13 March 2016, a failure at a substation caused the Lakwijaya plant to automatically shut down causing an island wide power outage.



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