

ENVIRONMENTAL EFFECTS OF THE PARALI THERMAL POWER PLANT

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ABSTRACT

For any developing nation, thermal power plants are the main source of electricity production. In our nation, thermal power plants produce around 60% of the electricity. Thermal Power Stations have been discovered to have severe negative effects on the local environment. Concerning environmental issues arise from the growing mounds of fly ash produced by thermal power stations using coal as fuel. The alarmingly large coal residue known as fly ash may cause environmental issues like the poisoning of surface and groundwater resources when it is dumped in the open. It affects the respiratory system of both humans and animals, as well as other illnesses. Also, it impacts the process of photosynthesis, the balance of minerals and micronutrients in plants, soil layers, structures, and buildings, all of which are impacted by corrosive reactions. In the Marathwada Area of District Beed in Maharashtra State, Parali Thermal Power Plant is located close to the town of ParaliVaijanath. An enormous quantity of ash is generated at the 750 MW Parli Thermal Power Station, which is owned by the Maharashtra State Power Generation Company (MSPGCL). This ash-mixed water is pumped and transported through pipelines before being dumped in an open region 5 to 6 kilometres from the station.

Key words: Environment impact assessment, coal, Thermal power plant, etc.

Introduction:

For any developing nation, thermal power plants are the main source of electricity production. In our nation, thermal power plants produce around 60% of the electricity. In a thermal power plant, heated water creates steam, which rotates a steam turbine that powers an electrical generator. The steam is returned to where it was heated after being condensed in a condenser after going through the turbine. Due to the many fossil fuel resources often utilised to heat the water, thermal power plants' designs vary the most.

Maharashtra State Power Generation Company (MSPGCL), a Maharashtra government-owned corporation in India, is the owner of the 750 megawatt (MW) coal-fired Parli Thermal Power Station. In the Marathwada Area of District Beed in Maharashtra State, Parali Thermal Power Plant is located close to the town of ParaliVaijanath. This station generates a significant quantity of ash, which is combined with water and pushed via pipelines and disposed in an open region 5 to 6 kilometres from the station.

The energy needs of emerging nations, in particular, are satisfied by thermal power plants that use coal as fuel. Maharashtra State Power Generation Company (MSPGCL), a Maharashtra government-owned corporation in India, is the owner of the 750 megawatt (MW) coal-fired Parli Thermal Power Station. In the Marathwada Area of District Beed in Maharashtra State, Parali Thermal Power Plant is located close to the town of ParaliVaijanath. This station generates a significant quantity of ash, which is combined with water and pushed via pipelines and disposed in an open region 5 to 6 kilometres from the station.

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Study region:

The Parli is one of the larger Tehsils in Maharashtra State's Beed district, which is 90 kilometres to the southeast of Beed City. The Balaghat range of hills encircles it. Ever before India gained its independence, it has profited from wide gauge links with other significant Indian cities. It was transformed into an urja city after independence by the construction of a thermal power plant in the Marathwada area. The Parli thermal power station in Parli City, Beed District, was chosen as the study area for the current investigation in order to examine the reuse and recycling potential of fly ash produced by the thermal power station as well as other environmental issues involving the fly ash and water bodies. When coal was burned in a boiler at a high temperature of 1400°C to 1500°C with too much air present, fly ash and bottom ash were produced. 13 to 15 tonnes per day on average are used in the generation of 1 Megawatt of power. The typical amount of ash produced by coal-based thermal power plants is between 35 and 40

percent, or 4 and 6 tonnes per day. 20% of the total ash produced is bottom ash, and 80% of it is fly ash that has been separated using electrostatic precipitators. Ash slurry is dumped in large quantities in the ash dike area. According to estimates, the Parli Thermal Power Station needs between 9500 and 10500 MT of coal per day, or 0.80 kg/KWH, to produce one kWh of energy. Because such a significant amount of coal is burned in the boiler, a lot of ash is produced; 300 to 400 tonnes of ash are produced each day, or around 11.46 lakh tonnes annually. The thermal power plant's produced ash is collected separately. The amount of fly ash collected totaled 9.17 tonnes in dry fly ash and 2.34 lakh tonnes in wet fly ash or slurry.

Around the new thermal power plant on Gangakhed Road, about 4 to 5 kilometres to the north-east of Parli City, the fly ash was discharged as a slurry. Only a very little amount of fly ash was dumped on historic fly ash dykes, which are located roughly 2 to 3 kilometres to the west of the former thermal power plant.

Ash pours and falls on roadside during truck transportation of the ash from the ponds.

Ash flies into the air and causes issues when other cars drive over it.

Objective:

The main objective of the research paper is Assessing the effect of electricity thermal plants on the environment.

Database and methodology:

The methodology adopted in this paper is mainly based on secondary data from various thermal power plant, namely, thermal power and government pollution department.

Results and discussion:

Around the new thermal power plant on Gangakhed Road, about 4 to 5 kilometres to the north-east of Parli City, the fly ash was discharged as a slurry. The ash ponds must be put up on a significant area, which not only becomes a source of pollution but also renders the land completely unusable. For the purpose of examining the disposal of the toxins, the already-existing ash ponds require prompt attention.

Only a very little amount of fly ash was dumped on historic fly ash dykes, which are located roughly 2 to 3 kilometres to the west of the former thermal power plant. Fly ash is challenging to transport since the air-polluting, lightweight particles have a tendency to fly. The ash overflows and falls on the sides of the road while it is being transported from the ponds in trucks. Ash flies into the air and causes issues when other cars drive over it.

Impact on Agriculture:

When used as a soil amendment to change the pH of the soil, flyash has a strong chance of being used in agricultural areas. to enhance the chemical and physical qualities of soil as a soil conditioner. as a supply of vital nutrients for plants. Most of the common soil types and flyash have a lot of the same physical, chemical, and mineralogical characteristics. Yet, using fly ash as fertiliser for an extended period of time makes the soil difficult. The majority of the natural elements are found in coal ash in trace amounts; nonetheless, the addition of flyash alters the soil's physical characteristics, mineral composition, and chemical balance. After being released into the environment, the minerals in flyash could be used by plants. Power plants produce a lot of flyash particles, and these particles are then deposited on vegetation and soil surfaces, increasing the flow of numerous elements into the surrounding environment.

Biological & thermal impact:

The nearby aquatic biota may be harmed by the waste water's greater temperature when released. Direct thermal shocks, changes in the concentration of dissolved oxygen, and the displacement of organisms within the immediate area are the main consequences of thermal pollution. The majority of aquatic creatures have evolved enzyme systems that only function in specific temperature ranges because water can absorb thermal energy with just slight changes in temperature. Sudden temperature swings that are greater than what their metabolic systems can tolerate can kill these stenothermic species. Fish mortality is caused by periodic heat treatments required to keep the cooling system free of fouling organisms that block the intake pipes.

Via the leaves and branches, these particles enter the plants, disrupting the equilibrium of minerals and major and micronutrients in the plants. They have a devastating impact on plant development. This has prevented the development of any significant industrial areas within a 20-kilometer radius of the source, and the habitations are also having serious issues. similar to how prolonged inhalation creates severe respiratory issues in living things

Conclusion:

Thermal Power Plant has a significant negative impact on the local ecology. Also, they harm the ecosystem and have a significant role in the decline of human, animal, and plant health. Mineral, micronutrient, and major nutrient imbalances occur in plants as a result of pollutants entering through leaves and branches, which has a negative impact on plant growth. The biological and non-biological uses of flyash are being emphasised a lot. Flyash's physicochemical characteristics vary on the kind and quality of coal burned, hence its unique impact on the impacted areas, particularly on the flora, is a topic of discussion in the ParliVaijnath region of the Beed District.

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