



IMPACTS OF BUDGE BUDGE POWER PLANT ON ITS SURROUNDINGS AND FLY ASH MANAGEMENT

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Abstract

Due to the presence of toxic metals, dumping of fly ash is causing ever-growing environmental problem including the pollution of air, water and soil. The present study investigates the possible environmental impacts associated with the land disposal of fly ash generated in the power plant of Budge Budge. This paper attempts to highlight the effects of fly ash on its surroundings and management of it to make use of this solid waste, in order to save environment.

Keyword: fly ash, solid waste, thermal power plant, contamination, soil fertility.



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Introduction The boom in population and industrial growth, the need for power has increased manifold. Coal-based thermal power plants have been a major source of power generation in India, where 75% of the total power obtained is from coal-based thermal power generation through coal combustion produces minute particles of ash that causes serious environmental problems. It is fine glass powder, the particles of which are generally spherical in shape and range in size from 0.5 to 100µm. Fly ash is classified into two types according to the type of coal used. Anthracite and bituminous coal produces fly ash classified as class F, class C fly ash is produced by burning lignite or sub bituminous coal.

In 1993 the CESC has set up its thermal power plant in the name of Budge Budge CESC limited in Pujaly Municipality (Budge Budge -1 segment). On the bank of the Hugli river. Many people are farmers here. With the set up of the industries and increasing habitation around the land harm the agricultural production process in the nearby locality.

Location Pujali is situated in the south of Kolkata Metropolitan Planning area, on the east bank of River Hoogly. It is Municipality town under Budge Budge Police station. Nearest Railway Station Budge Budge is about 6 Km away from City and 32 km away from Sealdah Railway Station. Geographical coordination are 22°28' N – 22°47' N and Longitudes 88°15' E – 80°06' E.

Background of the Study Area

Physical Set up-Budge Budge block-1 is in the district of 24 parganas (south) and situated on the bank of Hugli River and the region is on the alluvial plain. A canal named Charial canal is situated here. Since the region is based on the ALLUVIUM the character of soil is of a variety. Though in the past vegetation was fairly noticeable here. But with the growing process of industrialization the vegetation was going to be almost nowhere. The climate here is humid. Pre-monsoon or summer, monsoon or rainy season is under the influence of south-west monsoon wind.

Demographic Condition: The study area containing 15 wards, total population of municipality is 33868 and total male population 17670, total female population 16193. The literacy rate of the whole municipality is 60% which is comparatively lower than national literacy rate.

Objectives The objectives of the study are given here.

- 1.To study the role of Budge Budge plant in the surrounding area.
- 2.To find out the problem faced by local people due to the emission of fly ash.
- 3.To suggest the remedies to overcome the problems.

Methodology In order to pursue the study, a **three phase approach** has been used:

Phase	Methodology
Pre-field Phase :	<ul style="list-style-type: none"> • Collection of secondary level information and data from census, reports and maps, imageries. • Preparation of route map and questionnaire.
On-field Phase :	<ul style="list-style-type: none"> • Physical inspection of the study area. • Collection of primary level information and data through questionnaire survey, • Secondary information from Administration • Documentation of information and Initialization of evaluation
Post-field Phase :	<ul style="list-style-type: none"> • Further refinement of collected information. • Final evaluation with editing as required • Final creation of content.

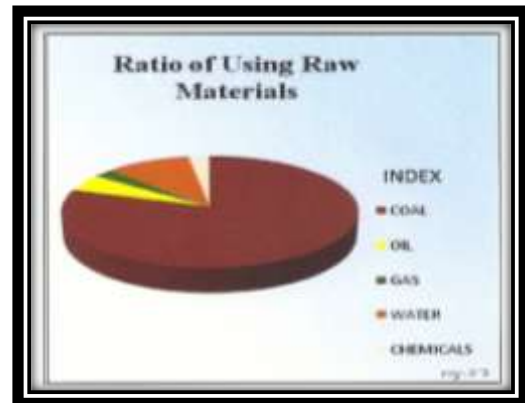
Performance Report of The Budge Budge Power Station

The Budge Budge power generating station established on 16th September, 1997. Then the total area of power plant was 308 acres or 1246432 sq.m. On the 6th March 1999 the second

unit of the plant was established. Finally on the 3rd July 2009 unit III was established and then the area extended to 83 acres or 335889 sq.m.

1. Types of raw materials: The following type of raw materials are used to generate power: coal(pulverized),oil(HFO and LDO),gas(H₂N₂), water, lubricating oil, different type of chemicals(HCL,H₂SO₄,NaOH, Sodium Hypochloride, non-ferric aluminium,poly electrolyte). The proportion of using raw materials-coal:oil:gas:water:chemicals-8:0.5:0.25:1:0.25

2. Coal imported features : The main part the raw materials is coal. Coal is imported from Raniganj, Jharia, Badam Pahar, Talcher and Indonesia. Raniganj is the nearest importing place. So, the rate of the coal import is highest from raniganj. The Indonesia is almost in highest distance.So the rate of importing coal is lowest from Indonesia.



3. Waste materials: The CESC have two Chimneys to smoke out the flue gases and ash (few in proportion). A large chimney having 275mt. height and 35mt. diameter helps to out the maximum gases and smokes and others' height is 222mt. and 12mt diameter. After burning the coal and other materials, mainly ash is generated from the chimneys. Ash is two types – flying ash and bottom ash. Some flue gases are also coming from chimney.

Fly ash (50%)- collected in Electro Static Preipitator(ESP) and stored in ISH for loading Barge. It is exported in Bangladesh for Ceramic plant as raw materials.

i. **Bottom ash(42%)-** collected in boiler bottom ash hopper and stored in ash Silo for removal by trick for ground or earth filling, lowland, structures.

ii. **Flue gases (80%)** flue gases are Sox, NO_x, CO etc.

Water vapour is also added with the flue gases in short proportion.

Production features: The Budge Budge power plant acquires the service area about 224 sq. km. which includes the surroundings area of Kolkata and Howrah. There is a fluctuation trend in month wise production of the plant. The trend reveals the fact that due to heavy power consumption demand during September to November (Durga Puja season) power production rises high to combat the demand in this season. The three units have no same capacity of works. In average the units have capacity of power production of 250 MW.

- The Paddy field and cultivated lands are reduced and turned mostly settlement area.
- Some of the portion of agricultural lands had taken by CESC for ash disposal ground.
- Major changes have been found in settlement area. Settlement area is increasing rapidly. Formerly the area of settlement was 2.4 km² which turns to 3.08 km².
- The portion of fallow land and vacant land has reduced and those areas complemented with settlement and brick field.
- The area of brick Field along the Hugli River has extended comparatively than before.

The industrial extension and impact of ash on agricultural production causes the arable land is in declining phase, at the same time settlement and brick field area have flourished than before.

It can be said that after establishment of CESC the region began to flourish infrastructural and socio-economically, that pushed to one level up of hierarchy of Urban Centre.

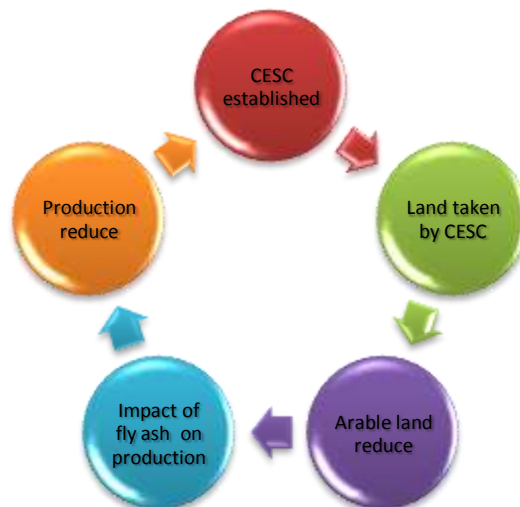
Thermal Power station Influencing Regional Planning

- **Population and Household Distribution:** Industry always influence on concentration of population. But in the case of power plant for fly ash problem the population concentration dispersed.
- **Rehabilitation Facilities:** Due to land acquisition the CESC management office gave facility to the rehab persons. They get land price at satisfied rate, rehab quarters to stay, provide employment facility in CESC and Ancillary industries, and also provide pet animal compensation and agricultural compensation.
- **Growth of Other Industrial Fields:** CESC helps to flourish different types of industries like Jute mill, Bottle Plant, Plastic Farm, Pesticide industry, fly ash brick farm. Those industries give a huge source of income to local people. Now plastic farms are closed.
- **Development in Transport System:** A progressive changes have been found in road and transport system. Firstly, the Pujali Trunk Road width increases in two phases (2006 and 2010) by 2ft at both sides. Consequently the vehicles flow easily also in case of ash loading track. Many of the unmetalled roads are replaced by pucca roads(59km).-

Problems

- Fly ash creates many problems. The fire particles of fly ash reach the pulmonary region of the long periods of time; they behave like cumulative poisons and causes heart diseases, allergy problems. The local people are facing dust problem a lot.

- The ash creates various problems on local people. The components of ash are very harmful to human beings. This causes heart disease, different types of allergy problem especially on child aged and old aged people. The continuous emissions of flue gases pollute air. The local people face the dust problem a lot.
- The continuous emission of flue gases pollutes air. A thick layer of ash concentrate on leaves plants, seed and reduce production. According to Chinsura research Station a typical insects attacks fruits, vegetables, crops surroundings the power station.
- It leads to a remarkable decrease in crop production.
- Fly as often leads to river water contamination.
- As coal contains trace levels of trace elements (like arsenic, borium, boron, cadmium, selenium, mercury and others) fly ash obtained after combustion of this coal enhances concentrations of these elements, and therefore the potential of the ash to cause ground water pollution is increasing.
- It degenerates aquatic life causing ecological misbalance.



Management of Fly Ash

Fly ash management has taken considerable strides over the past few years. Researchers have been attempting to convert this waste into wealth by exploring viable avenues for fly ash management. Fly ash is oxide-rich and can be used as the raw material for different industries.

Today, fly ash bricks can be used as a building material. The American Embassy in India has used fly ash bricks in some of its recent construction. Use of fly ash in the construction of roads and embankments has been successfully demonstrated in the country and it is gaining

acceptance. The NTPC (National Thermal Power Corporation) is setting up two fly ash brick manufacturing plants at Badarpur and Dadri near Delhi.

Bio fertilizer produced by fly ash improves the plant's water and nutrient uptake, helps in the development of roots and soil-binding, stores carbohydrates and oils for use when needed, protects the plants from soil-borne diseases, and detoxifies contaminated soils. This helps in keeping both air and water pollution under control. Marigold, tuberose, gladiolus, carnation, sunflower, poplar, sheesham, and eucalyptus now grow at the demonstration site of the power station.

Use of fly ash in agricultural applications has been well demonstrated and has been accepted by a large number of farmers.

The National Capital Power Station of the NTPC has come up with an innovative technology for commercial utilization of this by-product. Known as the dry ash technology, it is considered environment-friendly. Under the dry ash technology, the fly ash is collected in huge mounds with a filter bed provided at the bottom of the mound. Grass is planted on the slopes of the fly ash mounds and polymer layering is also done to prevent the ash from being blown by the wind. Fly ash treated by this method develops certain physical properties that make it more suitable for commercial purposes.

Suggestions

- Removal of ash through pipe to a proper places
- Prevention of pollution through planting effective trees.
- Use of advanced machinery for prevention of pollution
- Maintenances of sewerage system.
- Sending of more and more ash to distant places
- Setting up of Machinery for measuring pollution
- Setting up of Environmental Impact Assessment

Yet they remain critical and apprehensive because of the real nature and scenario of the agricultural and public life currently prevailing in the region. It can be concluded that the thermal power plant (Budge Budge Generating Station) has vital role in regional planning and it tries to take proper management of ash.

CONCLUSION-

If we consider the overall social wellbeing and agricultural development side by side in view of the industrialization in the region, it is rather difficult to come to a conclusion whether the CESC power plant is just or unjust. But it is apparent from the various aspects of the study

that there are certain reasons which are affecting the cultivation process and human health and it is possible to overcome all this by taking proper attention and adopting effective remedial measures. There can be denying the fact that in a developing economy like ours we need development in agriculture as well as industrial growth for economic progress.

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