Implementation Report on Fly Ash Dump Site Slope Stabilization & Green Capping by Implementation of Bioengineering Components

Project by

BOKARO POWER SUPPLY COMPANY (P) Ltd.
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Fly Ash Dumpsite stabilization & Green capping using bio-engineering components

Fly ash dump site has a typical problem of spreading of fly ash by wind, water to create e severe air, water and soil contamination of surrounding area.

This leads to a severe environmental impact and it is very difficult to restore and revive the land through conventional civil and partial remedial approach. In normal conditions green belt development & restoration is very difficult due to the high content of heavy metals in fly ash and complex texture of fly ash in terms of extremely less porosity and distinct properties of fly ash in summer season and rainy season.

Major Environmental & Social Impacts

- Soil Pollution
- Water Pollution
- Air Pollution

Agriculture Land Pollution

Canals, Water bodies & River Pollution

Health & Sanitation problems

Sustainable Eco-friendly Stabilization & Green capping Methodology for pollution mgmt.

The restoration technique based on an integrated approach by using sustainable green technologies to stabilize & restore the fly ash dump site by using natural bio degradable materials, Beneficial Microbes, vetiver plants to stabilize and restore the fly ash dump area.

Vetiver plants grown on fly ash for three to four months showed massive, mesh-like growth of roots which could have a Phyto-stabilization effect. Vetiver is used for phytoremediation of coal fly ash; its shoots can be grown vigorously spreading due to heavy root system formation and abortion of heavy metals.

The Fly ash restoration site preparation has to be done with dozers and rollers. Water sprinklers to be fitted in the area with periodic watering for wetting the area for plantation.

After compacting of fly ash slope are with rollers, the Jute Geotextiles and biomass mass with beneficial microbes' application on the surface for creating a biomass mulch with a blend of Microbial consortium as base substrate for plantation.

Regular watering is required for 3-4 months to make faster growth of plants for stabilizing the dump site.

The fly ash area will be stabilized within 3-4 months and the whole area will be covered as complete green mulch within six months.

Significance of Bio-engineering Techniques

The Fly Ash dump site area fully stabilized and restored by the Application of Jute Geo textiles, Biomass substrates, Beneficial Microbes and sustainable plants (Vetiver) directly on fly ash through Bio-engineering techniques

The Bio- engineering Techniques of Restoration WITHOUT USING SOIL.

The fly ash dump area RESTORED WITHIN 3 - 4 MONTHS with A PERMANENT NATURAL GREEN CAPPING to control the environmental problems.

The Fly Ash Dump Site Restoration Technique is 100 % ECO-FRIENDLY and practically applicable to the effective CONTROL SOIL, WATER AND AIR POLLUTION.

Project site: Bokaro Power Supply Co. (P) Ltd.

Fly Ash dump site stabilization and green capping using Bioengineering Components

Area of work

Slope Ht. / Length - 100 mt.

Slope width - 80 mt.

Total area of Stabilization - 8000 Sq.m

Materials & Methods

Materials used in the project

- Jute Geo textiles
- Coco Geo Log filled with coco fiber and outer coir net – 20 cm diameter x 1mt. length
- Vetiver plants
- Biomass Substrates – Coco pith / Biomass blend substrates
- Compost for surface covering & plant base application
- Microbial consortium
- Fertilizers & Hydro gel
- Bamboo sticks / Pegs & bamboo poles for fixing the jute geotextiles and coir geo logs
- Fertilizers for plant growth
- Watering & maintenance

Installation of Fly Ash Dump Site Slope Stabilization &
Green Capping by Implementation of Bioengineering Components

The environmental problems in Fly ash dumpsites

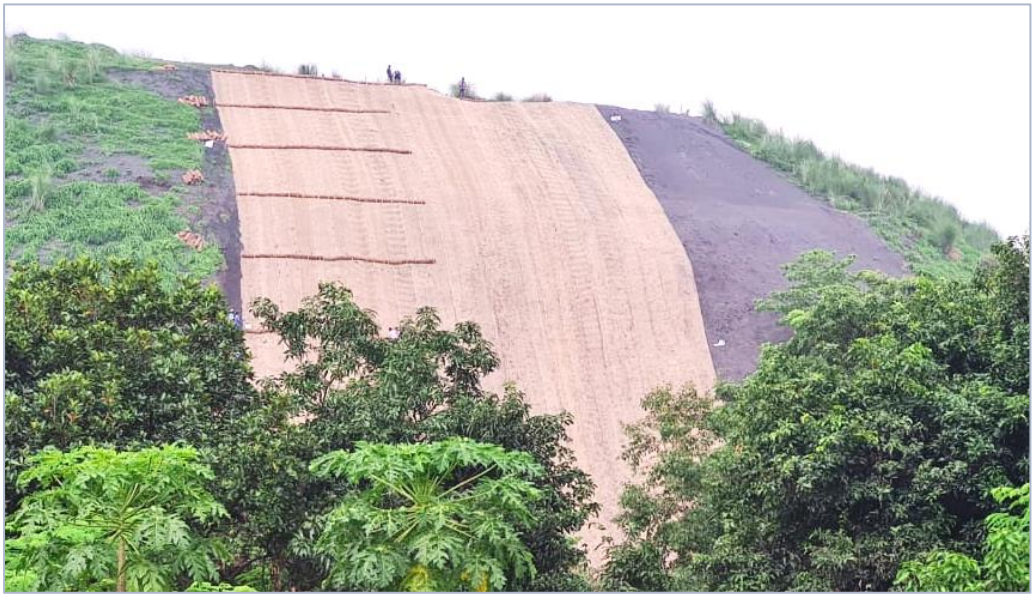
Site preparation for Stabilization

Laying of Jute Geotextiles and fixing with Bamboo pegs

Site preparation for fly ash mount Stabilization

Fixing of Jute geotextiles & Coir logs for ash sliding control and compaction of site for plantation

Site preparation for fly ash mount Stabilization



Site Ready for Vetiver plantation

Site preparation for fly ash mount Stabilization

Vetiver plantation with biomass & compost base with Microbial applications

Plantation on compacted Jute geotextiles mulched area

Vetiver plantation growth in 1 month

Vetiver plant growth on bioengineered fly ash mount

Vetiver plant growth in 2 months

Stabilized fly ash mount by bioengineering plantation developments

Vetiver plant growth in 3 months

Stabilized fly ash mount by bioengineering plantation developments

Area – 100 mt. Height x 80 mt. width - 8000 Sq.m

Fly ash mount stabilization & Pollution control by Bioengineering & Green capping

Project Design, Implementation & Monitoring by

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