

## **ABSTRACT**

*Coal production is necessary for development of a country and we are fortunate that India has wide coal reserves. Coal exploration is the main source of power generation in the country. However coal mining creates acute problem of land degradation. Since, coal exploration cannot be stopped so land degradation will also continue. So, remedial process like eco-restoration is required as a solution.*

*Thus, the present research was undertaken to suggest suitable low cost and effective reclamation strategies for Jharia coalmines where coal fire is a cause for further land degradation. Baseline data was collected from the overburden dump site. Then treatment plots were designed in the garden area where the plot experiments were conducted. The saplings of five plant species grown in the mixed plantation were *Azadirachta indica* (Neem), *Dendrocalamus strictus* (Bamboo), *Emblica officinalis* (Amla), *Ficus religiosa* (Peepal) and *Saraca asoca* (Ashok). The plants were two months old at the time of plantation. The various aspects that were attempted to study were plant growth, soil fertility, enzymatic activity, mycorrhizal root colonization, effect of treatments. Among the various treatments, cow dung addition was found to be very useful. *Saraca asoca* was not so fit to survive in the harsh conditions of the dump. Such a short term research helped to know the deficiencies occurring in the dump spoil. A unique study of phosphorus fractionation was also undertaken to know the type of phosphorus deficiency which is a limiting factor usually, in the restoration activities. Enzymes like dehydrogenase and catalase shot up with addition of soil amendment showing positive growth response of microbes. Plants like *Dendrocalamus strictus* and *Ficus religiosa* showed complementary growth and vigour. These two species can be confidently proposed for the restoration practices. Application of vesicular arbuscular mycorrhiza was highly recommended. This short term study was helpful for definite proposal of reclamation strategies. The findings can be used globally for reclamation activities.*