



## ESTIMATION OF CARBON SEQUESTRATION POTENTIAL AND PHYTOSOCIOLOGICAL STUDIES OF TREE SPECIES IN COAL MINED AREAS OF DHANBAD, JHARKHAND, INDIA

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**ABSTRACT:** Ecological restoration is an important tool for the protection and maintenance of vegetation structure, biodiversity and soil fertility that can provide theoretical and practical support for this practice. In the present phytosociological study, biomass of tree species and carbon sequestration potential of different component (tree, soil and leaf litter) were measured. Phytosociological study analyzed the vegetation structure, composition and diversity of plant species. The most frequent species recorded for *Dalbergia sisso* (60%) with IVI of (156.44) in Kusunda and the least frequent species recorded for *Alstonia scholaris* (40%) with IVI of (147.21) in Barora. The highest tree biomass (t/ha) and carbon sequestered (t/ha) was recorded for *Dalbergia sissoo* (9.85 and 4.93 t/ha, respectively) in Kusunda and lowest was recorded for *Pongamia pinnata* (0.27 and 0.14 t/ha, respectively) in Katras. The highest total equivalent CO<sub>2</sub> sequestered (t/ha) was recorded for Barora site (50.43 t/ha) and lowest was recorded for Katras (19.88 t/ha). In all the sites, Katras recorded highest litter accumulated and total carbon content (0.86 t/ha and 0.34 t/ha, respectively) and the lowest was recorded for Barora (0.16 t/ha and 0.06 t/ha, respectively). The maximum soil organic carbon (t/ha) and equivalent CO<sub>2</sub> sequestered (t/ha) was recorded for Kusunda (15.98 t/ha and 58.88 t/ha, respectively) and minimum was recorded Barora (4.86 t/ha and 17.84 t/ha, respectively).

**Keywords:** Biomass, carbon sequestration, organic carbon, phytosociology, tree species

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### INTRODUCTION

Mining and exploitation of mineral resources generally have a significant impact on the land, water, air, and biological resources as well as the socio-economic status of the local population. Extraction and mining of natural resources adversely affect natural vegetation, degradation of soil quality, fertility and makes it toxic. Coal mining is usually associated with the degradation of natural resources and the damage of habitat. This causes invasive species to occupy the area, thus posing a threat to biodiversity (Goswami S, 2015). The major effect of mining is deforestation which results in loss of flora and fauna, landscape and aesthetic value of surrounding.

Ecological restoration is the practice of restoring an ecosystem that has been degraded, damaged or

destroyed (AER, 2004). Restoration of degraded mined areas to achieve sustainable development is an ecological task. The aim of restoration of an ecosystem that is flexible and self-sustaining with respect to structure, species composition and function, as well as being integrated into the larger landscape and supporting sustainable livelihoods. Natural resource management for both terrestrial and aquatic environments is the primary focus for the restoration of degraded ecosystems (Millennium Ecosystem Assess, 2005). At the meeting of the Convention on Biological Diversity in Nagoya, Japan, 2010 all the countries committed to a new target of restoring 15% of the degraded ecosystems worldwide by 2020 (Secretariat of the Convention on Biological Diversity, 2010).

Phytosociology is the study of the characteristics, classification, relationship and distribution of plant