

## Estimation of carbon sequestration in Jharkhand forests through non-destructive method

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**Abstract:** Carbon is the most important element supporting the existence of life on the earth as well as contributing to green house gas (GHGs) concentration in atmosphere. Forests are important source and sink of carbon in the global biogeochemical cycle. Exchange between atmosphere and vegetation carbon involves two-way fluxes- fixation of CO<sub>2</sub> into biomass through photosynthesis and release of CO<sub>2</sub> through processes of decomposition and burning. Biomass estimation based forest management is the key epilogue of Kyoto protocol of United Nations Framework Convention on Climate Change (UNFCCC). Regeneration or afforestation programme taken by different nations to equalize the gap of demand and supply requires transparent information of carbon sequestration in respective countries. In India under IGBP-NCP programme Indian Institute of Remote Sensing (IIRS), Dehradun has been entrusted to estimate the national carbon status within a fixed time span with uniform methodologies all over the country.

The present paper is based on generating data of vegetation carbon in the forest areas of Santhal Parganas and Giridih of Jharkhand state as per the prescription of IIRS, Dehradun using NDVI of remote sensing as a reference tool. From the inventory conducted in the area, trees above 10 cm dbh of 0.1 hectare plots were selected for biomass and carbon contents estimation with the help of volume equation and specific gravity of trees.

Study reveals that the naturally dominant tree species in these forests are *Shorea robusta*, *Madhuca indica*, *Semicarpus anacardium*, *Buchanania lanzen* and others whereas the man-managed tree species grown outside forests (TOF) include *Anacardium occidentale* *Eucalyptus* sp., *Pongamia paniculata* and *Acacia* sp. District-wise biomass of trees was found to be the highest (150.01 t/ha) in Dumka followed by Giridih (86.80 t/ha), Jamtara (67.56 t/ha) and Godda (52.85 t/ha). On the basis of individual tree-wise contribution to the carbon sequestration, *Madhuca indica* (0.207 t/tree) supersedes *Shorea robusta* (0.140 t/tree) in forest block compartments whereas in TOF *Eucalyptus* sp. (0.407 t/tree) and *Mangifera indica* (0.294 t/tree) contributed maximum.

**Key Words:** Carbon Sequestration, Forest Biomass, Remote Sensing, GIS