

THE SPECTRAL MODELLING OF ABOVE GROUND FOREST BIOMASS IN JHAJRA FOREST RANGE OF DEHRADUN FOREST DIVISION USING MICROWAVE DATA

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Abstract: Forests play an important role in the global carbon cycle as a carbon sink. Deforestation and degradation of forests lead to carbon emissions, which should be prevented or minimized by protecting forests. Radar remote sensing has proven to be particularly useful to monitor forests especially in the tropics due to weather and daytime independence. Radar data from the ALOS PALSAR-2 provide a potential opportunity to monitor large areas of tropical forests due to the high resolution. The study describes the development of a logarithmic model for the estimation of forest above ground biomass and carbon using ALOS-PALSAR-2 synthetic aperture radar (SAR) data. The backscatter coefficient of the SAR data in different polarizations were quantified using field data collected in the Jhajra forest range. A significant correlation has been observed between HV backscatter and plot level biomass with a coefficient of determination ($R^2 = 0.8918$). The up-scaled biomass ranges from 5.2 tonnes/ha to 397.45 tonnes/ha. The total amount of carbon stored in the Jhajra forest range is 237471.99 tonnes. The carbon sequestration potential of the forest is 871522.20 tonnes.

Keywords: Biomass, Backscatter, Spectral Modelling, ALOS-PALSAR-2, Carbon Sequestration

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