

Evaluating the measurement of litterfall in the Sahyadri region of Maharashtra through the utilization of remote sensing data

Preface

The transfer of carbon from plants to the soil occurs through litterfall and the subsequent decomposition of litter by microorganisms and bacteria. While all trees contribute to carbon sequestration, hardwood deciduous trees are particularly effective in trapping and storing carbon dioxide. Assessing the annual litterfall in forests worldwide is crucial for understanding the concentration of organic soil carbon. It enables the examination of the relationships between the forest floor, soil characteristics, meteorological factors, and location. Numerous international and Indian literature have explored litterfall as a topic related to carbon sequestration and its impact on climate change. Traditional methods of quantifying litterfall collection are time-consuming and outdated. In this study, our objective was to quantify the organic carbon content of litterfall in deciduous forests. To achieve this, we used existing literature references to obtain data on litterfall quantification and establish an index linking litterfall to soil carbon content. Unfortunately, we were unable to conduct ground validation of the predicted litterfall map, which is a limitation of our research. However, we collected litterfall site data points and employed predictive modeling based on the deciduousness of the forests to estimate litter quantities. The predicted maximum litterfall quantity was 30.2087 tons/ha, while the minimum was 21.735 tons/ha. Moist deciduous forest areas in Sahyadri exhibited higher litterfall amounts. Referring to Ma et al.'s research on the carbon percentage in litterfall, we predicted forest soil carbon in the state of Sahyadri, with carbon measurements ranging from 0.14467 kg/m² to 0.104089 kg/m².