

Extraction of Forest Plantation Resources in Selected Forest of San Manuel, Pangasinan, Philippines Using LiDAR Data for Forest Status Assessment

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Abstract : Forest inventories are essential to assess the composition, structure and distribution of forest vegetation that can be used as baseline information for management decisions. Classical forest inventory is labor intensive and time-consuming and sometimes even dangerous. The use of Light Detection and Ranging (LiDAR) in forest inventory would improve and overcome these restrictions. This study was conducted to determine the possibility of using LiDAR derived data in extracting high accuracy forest biophysical parameters and as a non-destructive method for forest status analysis of San Manuel, Pangasinan. Forest resources extraction was carried out using LAS tools, GIS, Envi and .bat scripts with the available LiDAR data. The process includes the generation of derivatives such as Digital Terrain Model (DTM), Canopy Height Model (CHM) and Canopy Cover Model (CCM) in .bat scripts followed by the generation of 17 composite bands to be used in the extraction of forest classification covers using ENVI 4.8 and GIS software. The Diameter in Breast Height (DBH), Above Ground Biomass (AGB) and Carbon Stock (CS) were estimated for each classified forest cover and Tree Count Extraction was carried out using GIS. Subsequently, field validation was conducted for accuracy assessment. Results showed that the forest of San Manuel has 73% Forest Cover, which is relatively much higher as compared to the 10% canopy cover requirement. On the extracted canopy height, 80% of the tree's height ranges from 12 m to 17 m. CS of the three forest covers based on the AGB were: 20819.59 kg/20x20 m for closed broadleaf, 8609.82 kg/20x20 m for broadleaf plantation and 15545.57 kg/20x20m for open broadleaf. Average tree counts for the tree forest plantation was 413 trees/ha. As such, the forest of San Manuel has high percent forest cover and high CS.

Keywords : carbon stock, forest inventory, LiDAR, tree count

Conference Title : ICSR2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020