Abstract

Terrestrial carbon sequestration is an important pathway of minimizing CO2 concentration in the atmosphere. Tropical evergreen trees like cashew have some adaptive mechanism in an environment with strong seasonal variation of light and water. In this study, multilayer satellite images from the vegetation (VGT) sensors on board the Spot satellite (01/2006 to 12/2009) for
Cashew plantations areas of Tamilnadu, India were analyzed for temporal variability. The temporal analysis of vegetation indices was done and the GPP (Gross Primary Productivity) was calculated using the satellite based vegetation photosynthesis model (VPM). The enhanced vegetation index (EVI) identified subtle changes in the seasonal dynamics of leaf phenology in Cashew plantation area, as supported by leaf moisture content and leaf area index. The land surface water index (LSWI), indicates that the plantation experienced water stress during the dry seasons. The VPM model which uses EVI, LSWI and site specific climate data for 2008-2009 predicted high GPP in the late wet season than in summer season. The GPP calculated from the remote sensing data are classified into three classes using Radial Basis Function Neural Network (RBFNN). The calculated GPP of different months in a year showed that the monthly GPP ranged from 50-128 g C/m². The RBFNN is trained to provide an output value of 0, 1 and 2 for carbon sequestration which ranged from 50-75, 76-100 and 101-125 g C/m², respectively. The experimental results shows that the RBFNN classifies the carbon sequestration with an accuracy of 95.2%.

Reference

- X. M. Xiao, S. Boles, J. Y. Liu, D. F. Zhuang, M. L. Liu, Characterization of forest types in

**Index Terms**

Computer Science

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Carbon sequestration

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Gross Primary Production (GPP)