

Plot Scale Estimation of Crop Biophysical Parameters from High Resolution Satellite Imagery

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Abstract : The present study focuses on the estimation of crop biophysical parameters like crop chlorophyll, nitrogen and water stress at plot scale in the crop fields. To achieve these, we have used high-resolution satellite LISS IV imagery. A new methodology has proposed in this research work, the spectral shape function of paddy crop is employed to get the significant wavelengths sensitive to paddy crop parameters. From the shape functions, regression index models were established for the critical wavelength with minimum and maximum wavelengths of multi-spectrum high-resolution LISS IV data. Moreover, the functional relationships were utilized to develop the index models. From these index models crop, biophysical parameters were estimated and mapped from LISS IV imagery at plot scale in crop field level. The result showed that the nitrogen content of the paddy crop varied from 2-8%, chlorophyll from 1.5-9% and water content variation observed from 40-90% respectively. It was observed that the variability in rice agriculture system in India was purely a function of field topography.

Keywords : crop parameters, index model, LISS IV imagery, plot scale, shape function

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