



Estimation of Rice Crop Biophysical Parameters Using Multi-Temporal Sentinel-2 MSI Sensor Data

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Abstract: The study focuses to efficiently estimate and mapping rice crop biophysical parameters using high temporal and spatial resolution sentinel-2 satellite imagery. Biophysical properties provide a good understanding of physics of the interaction between vegetation and solar radiation. Crop canopy properties can be collected through inversion using nadir reflectance in various bands. NDVI is sensitive to the light, angle of view, sensor after canopy peak is touched. Rice crop biophysical parameters are autonomous from viewing angle and light conditions. The major rice crop biophysical parameters are leaf area index (LAI), Chlorophyll content, fraction of photosynthetically active radiation (FAPAR), canopy water content (CWC), fraction of cover (FCover), and crop biomass respectively. Biophysical parameters are known as mirrors of plant health construction and crop yield. Regression model was developed using chlorophyll, CWC, FAPAR, LAI and FCover with coefficient of determination 0.83 to accurately predict crop biomass. It is concluded that the study is helpful to monitor overall health of rice crop and it is proved that methodology has potential to estimate and monitor biophysical parameters of rice crop. From the study it is known that sentinel-2 has the potential to estimate and map rice crop biophysical parameters precisely.

Keywords: Rice crop, Biophysical parameters, Sentinel-2, Regression model
