

# **Hyperspectral Remote Sensing of Rice Agriculture for Field Scale Variability Mapping**

## **Short Abstract**

Precision agriculture (PA) and site specific crop management (SSCM) offer potential solution for increased rice production in an efficient and cost-effective manner along with low environmental impact. Advancement in remote sensing provides insights of the spatial variability in the field, thus farmers could avoid scouting and manage the rice fields where it is exactly needed using the help from global navigation satellite system (GNSS) and geographic information system (GIS). In this study, an improved methodology is established to investigate the crop growth under different nitrogen fertilizer treatments in an Indian rice agriculture system. Moreover, an advanced method- waveform classification embedded with clustering technique is proposed in this study to develop a pure spectral library for paddy crop. On the other hand, hyperspectral satellite imaging provides vital information for crop biophysical parameters estimation at certain critical wavebands. The spatial variability of paddy crop biophysical parameters (total chlorophyll, nitrogen content and leaf relative water content) at field scale with seasonal variability is investigated using temporal EO-1 Hyperion image from space platform. Besides these, a novel methodology is proposed here to incorporate critical hyperspectral narrow bands into multispectral high spatial resolution LISS IV data through index-based fusion approach to map the plot scale variability of biophysical parameters of paddy crop in an Indian agriculture system.