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Application of Rapid Eye Imagery in Crop Type Classification Using Vegetation Indices

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Abstract : For natural resource management and in other applications about earth observation revolutionary remote sensing technology plays a significant role. One of such application in monitoring and classification of crop types at spatial and temporal scale, as it provides latest, most precise and cost-effective information. Present study emphasizes the use of three different vegetation indices of Rapid Eye imagery on crop type classification. It also analyzed the effect of each indices on classification accuracy. Rapid Eye imagery is highly demanded and preferred for agricultural and forestry sectors as it has red-edge and NIR bands. The three indices used in this study were: the Normalized Difference Vegetation Index (NDVI), the Green Normalized Difference Vegetation Index (GNDVI), and the Normalized Difference Red Edge Index (NDRE) and all of these incorporated the Red Edge band. The study area is Varanasi district of Uttar Pradesh, India and Radial Basis Function (RBF) kernel was used here for the Support Vector Machines (SVMs) classification. Classification was performed with these three vegetation indices. The contribution of each indices on image classification accuracy was also tested with single band classification. Highest classification accuracy of 85% was obtained using three vegetation indices. The study concluded that NDRE has the highest contribution on classification accuracy compared to the other vegetation indices and the Rapid Eye imagery can get satisfactory results of classification accuracy without original bands.

Keywords : GNDVI, NDRE, NDVI, rapid eye, vegetation indices
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