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Research Paper :

A study on the paddy area in relation to soil properties and physiography using remote sensing in upper Krishna command project to Karnataka

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ABSTRACT

A study was undertaken in Shorapur taluka of upper Krishna Command (UKP) to know the impact of paddy cultivation on the soil properties. Physico-chemical properties of auger samples at different physiographic units were studied indicating alkaline to strongly alkaline reaction , while ESP values of auger samples ranged from 13.36 to 29.11 per cent and organic carbon of samples was spread between 0.26 to 0.65 per cent . Supervised maximum likelihood method was used to classify IRS P6 LISS-III imagery using ground truth data which indicated the land use statistics for the year 2005 where paddy covered the maximum cultivated area followed by groundnut, cotton and jowar. In confusion matrix the overall accuracy for the year 2005 was 86.99 per cent. Both the user and the producer accuracy were found above 78 per cent for all categories.

Key words : UKP, Soil properties, IRS P 6 LISS III, Classification, Paddy, Physiography

The upper Krishna Project is a major project taken up to irrigate drought prone areas of Gulbarga, Bijapur and Raichur districts of northern Karnataka. Shorapur taluka of Gulbarga district offers itself as a best study area as it has highest salt affected area before irrigation and considerable secondary salinized areas, has highest area under paddy crop. The Krishna and Devapur Halla are the major river/streams draining the area.

A number of national and state level projects like land use/land cover, soil resources inventory, waste land mapping, watershed development etc. using remote sensing technique have been carried out generating enormous database on the present natural resources scenario. These projects have greatly helped in establishing the rationality of operationalisation of remote sensing techniques in mapping and monitoring of information on natural recourses. Keeping these in view, a study had been carried out to interpret the soil properties and to determine land use/ land cover of UKP with special reference to paddy.

MATERIALS AND METHODS

The study area is located between longitudes $76^0$15' to $76^0$56' E longitudes $16^0$10 N to $16^0$35 and covers an area of 1,66,951.05 hectares comprising of 162 villages in Shorapur taluka of Gulabarga district of Karnataka state. The survey of India toposheets of 56 D_6, D_7, D_8, D_9, D_{10}, D_{11}, D_{14}, D_{15} on 1:50,000 were scanned and geocoded using ERDAS imagine 8.7. Finally all were mosaiced and subset was created demarcating talukaa boundary.

Digital image analysis :

Cloud free satellite data from IRS P6 LISS III imagery corresponding to path 98 and row 61 for the study area of Shorapur taluka procured on 27th February 2005

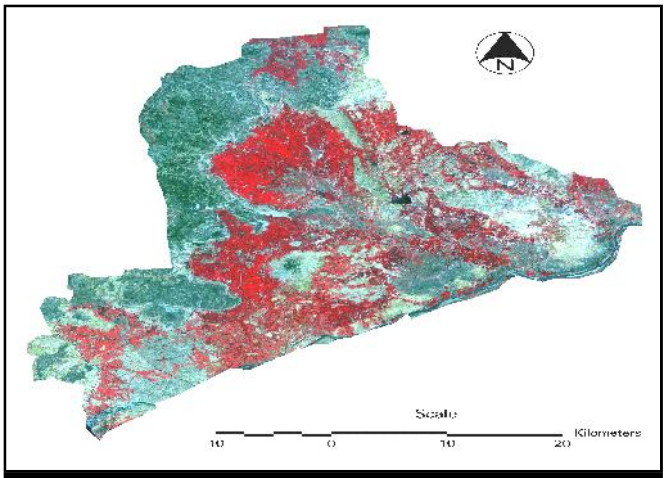

Fig. 1 : False colour composite of IRS P6 LISS image of Shorapur taluka, Gulbarga district, Karnataka (Feb 2005)

was registered and then subset was created as per the vector layer. Preliminary interpretation of the satellite data was conducted and GCPs, which were distributed uniformly throughout the image with minimum root mean square (rsm) error of less than 0.5 were selected. The administrative boundaries of the Shorapur taluka were digitized. False coloured composites of the study area were generated using bands 2, 3, 4 in blue, red and green filters