B-23: Thematic mapping from multi-spectral satellite data for watershed modelling with Agricultural non point source pollution

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Agricultural Non Point Source Pollution Model (AGNPS) requires an efficient method to estimate the spatial distribution of dynamic model parameters for watershed modelling. Land use/cover thematic maps derived fiom land resource satellite data are useful in providing spatial context for model parameters such as hydrologic curve numbers, surface condition constants, cropping and land management factors, Manning's roughness coefficient and chemical oxygen demand.

Single date Indian Remote Sensing (IRS) LISS II satellite data were processed to validate the methodology. Radiometric and geometric calibrations were performed and the study area was delineated at 40 m ground resolution. The best band combination of IRS data was selected as band 1,3 and 4 through Optimum Index Factor approach.

Unsupervised classification of 20 clusters which were subsequently merged into 6 thematic classes were assisted in the process of supervised classification. Six land use/cover classes namely forest, plantation forest, dense cover tea, perennial trees with sparse cover, bare or unproductive land and grass were identified in view of the hydrological importance based on the supervised classification. Extensive ground data collection was carried out with the aid of a Global Positioning System (GPS) and base maps to define training areas for classification. Accuracy of the classification was verified using 3 different estimates and overall map accuracy of 79.99% was found for the supervised classification. AGNPS model parameters were assigned to individual land use/cover classes and thematic maps were produced using reclassification in order to simulate the catchment dynamics using AGNPS model.