

Generation of land use/land cover map using remote sensing and geographic information system for Malegaon watershed in Maharashtra

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ABSTRACT

The research study was undertaken to generate land use/land cover map for Malegaon watershed of Nasik district. The base maps such as watershed boundary, drainage network were prepared with the help of Survey of India (SOI) topographical map. The satellite data of IRS-1B (LISS-II) of 11th November 1993, 30th January 1994 and 8th May 1994 of the study area were used for generating thematic map of land use/land cover map. The supervised classification was carried out for the satellite data of November 1993, January 1994 and May 1994 to prepare the land use/land cover map. The land use/land cover map indicated that 35.07% was *kharif* cultivated land and 4.32% was the double crop land.

Key words : Base maps, Thematic map, Remote sensing, GIS.

Over exploitation of watershed resources due to increase in population has resulted in their degradation in most part of the world. Both natural resources and socio-economic situation are integral parts of any watershed and should be given equal attention. Integrated management of natural resources on watershed basis is a rational and sound approach for sustainable development to realize national goals such as food security, poverty alleviation, and welfare of weaker section of the society.

A thematic map displays the spatial pattern of a theme or series of attributes. In contrast to reference maps which show many geographic features (forests, roads, political boundaries), thematic maps emphasize spatial variation of one or a small number of geographic distributions. The land use plan map designates the location, type and intensity of future residential, commercial, industrial and institutional development. It provides long-term guidance for the next 20 years and beyond.

Remote sensing and Geographic Information System (GIS) are the most handy and accurate tools to measure the various earth resources and their potentials. Using satellite based remote sensing various resources maps can be generated and using GIS tools these maps can be further analysed to derive a composite maps with numerous information, which finally derives new maps like land capability and land suitability maps.

Mohanty (1994) made an attempt to detect the changes in land use pattern using sequential aerial photographs of 1974 and 1989 and compared with SPOT

data of 1988 with the help of 'USEMAP' GIS software package. He suggested that in order to know the trend of development and land use patterns, analysis of sequential aerial photographs and satellite imagery of different years is useful tool. Das *et al.* (1997) conducted the study for groundwater exploration and development in Keonjhar district of Orissa. In this study, air borne and space borne data was used for qualitative evaluation of groundwater resources. Rao *et al.* (1997) undertook a study in Neelkanthpuram Watershed with the objective of generating action plans for sustainable development of land and water resources through the integration of information on soils, land use/land cover, slope hydrogeomorphology etc. using GIS approach. Chaurasia and Sharma (1999) studied the land use through IRS-1C (LISS-II) data of the Saroa block in Nawanshahr district, Punjab. Pandit *et al.* (1999) carried out a case study of Nasik district (Maharashtra) using remote sensing and GIS based integrated watershed development.

METHODOLOGY

The information provided by the satellites in combination with other sources of information can be integrated through GIS to quantify the various parameters for efficient management of land and water resources in watershed.

Study area:

The study area covers the Malegaon watershed of Nasik Tehsil, which is located in the south-western part of Nasik district (Maharashtra) and lies between 72°28'