

An Analysis of Land Use & Land Cover Mapping Using Geo- Spatial technology A case study of Pat watershed in Jhabua District, Madhya Pradesh, India

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Abstract - Remote Sensing (RS) as an immediate assistant to field, as of late assuming an essential job in the examination and assessed the regular asset in any piece of the world. Quickly changes in land utilize and arrive cover, arrive utilize are regularly thought to be indistinguishable, they are fairly very unique. Land cover might be characterized as the biophysical earth surface, while arrive utilize is frequently formed by human, financial and political effects on the land. Remote Sensing, coordinated with Geographical Information System (GIS), give and helpful instrument to examination of land utilize and arrive cover changes at a territorial level. The geospatial innovation of RS and GIS holds the potential for opportune and cost compelling assessment⁵ of common assets. The systems have been utilized extensively in the tropics for creating valuable data on backwoods cover, vegetation compose and arrive utilize changes. Accordingly, we have been utilized RS and GIS to contemplate arrive utilize arrive cover changes in Pat watershed, Jhabua region, Madhya Pradesh, India covering a region of around 817.93sq/km. In this view the present work has been taken up to contemplate and evaluate a portion of the regular assets and ecological capability of study territory which is falling in the Survey of India toposheets No: 46I/8, 46I/12, 46J/5 and 46J/9. Under this investigation three topical maps, for example, area delineate, guide, and land utilize and arrive cover maps were readied. The land utilize and arrive cover examination on the investigation region has been endeavored dependent on topical mapping of the zone comprising of developed land, Agricultural land, Forest, Waste land and Water bodies utilizing the satellite picture. The examination presumes that there is a fast development of developed region. Land utilize and arrive cover data, when utilized alongside data on other normal assets, similar to water, soil, hydro-geomorphology, and so on. will help in the best land utilize arranging at the full scale and small scale level.

Keywords - Land use & Land cover, drainage map, GIS and remote sensing, Pat watershed etc.

I.INTRODUCTION

Multidisciplinary logical coordinated studies were completed to measure the asset capability of the region, to know the status of usage of assets and to distinguish any hardship because of informal administration. The examination specialists extensively layout the improvement choices on assets will empower organizers to plan projects to streamline efficiency from existing assets, and to start measure to revise irregular characteristics because of informal administration and common lack.

The land utilize/arrive cover example of an area is a result of normal and financial elements and their use by man in time and space. Land is turning into a rare asset because of gigantic horticultural land statistic weight. Henceforth, data ashore utilize/arrive cover and potential outcomes for their ideal utilize is basic for the

determination, arranging and execution of land utilize plans to meet the increasing demands for basic human need and welfare.

This data additionally helps with checking the elements of land utilize coming about out of changing requests of expanding populace. Land utilize and arrive cover change has turned into a focal segment in current procedures for overseeing common assets and checking natural changes. The progression in the idea of vegetation mapping has significantly expanded research ashore utilize arrive cover change in this way giving a precise assessment of the spread and strength of the world timberland, meadow, and farming assets has turned into an imperative need. Remote detecting and GIS are presently giving new instruments to cutting edge biological system administration. The accumulation of remotely detected information

encourages the concise investigations of earth framework work, designing, and change at nearby, provincial and worldwide scales after some time, such information likewise give an imperative connection between serious, confined natural research and local, national and global protection and administration of organic assorted variety (Wilkie and Finn, 1996).

1. Study area-The study area lies to pat watershed, Jhabua district, Madhya Pradesh, India situated between parallels of 74°19'46"E to 74°44'03"E longitude and 22°50'27"N to 23°10'36"N latitude with intended boundary falling in Survey of India toposheet no. 46I/8, 46I/12, 46J/5 and 46J/9. The total area covered is 817.93sq/km.



Fig.1 Location map of the study area.

In the study area major towns or villages are Thandla, Meghnagar, Rambhapur, Petlawad, Bhagor, Kakanwani, Agral and other small villages are include in study area.

2. Objectives-

- To set up the topical maps to be specific area, arrive utilize arrive cover, and seepage.
- To ponder the present status of water assets, regular assets, arrive assets, soil productivities, editing designs, woods cover utilizing satellites information, insurance information and fields information.
- To get ready activity plan for land, water and horticulture assets.

II. MATERIAL AND METHODS

The study has made use of various primary and secondary data. These include Survey of India (SOI) topographic sheets of 46I/8, 46I/12, 46J/5 and 46J/9 of 1: 50,000 scale and satellite image IRS P6 (LISS-III) 23.5 meter goals information of 1:50,000 scale. The India Remote Sensing Satellite information was outwardly and carefully deciphered by utilizing the picture translation components, for example, tone, surface, shape, design, affiliation and so forth and Arc GIS programming was utilized for preparing,

investigation and incorporation of spatial information to achieve the goals of the examination. After fields survey we were going to for prepared thematic maps whatever we have above selected. The main objective of this study to extract the land use & land cover changes and categories of the study area.

1.Preparation of thematic map- These maps are the genuine portrayal of earth marvels, for example, spatial dispersion of common assets existing at the season of overview (Ravi Gupta, 2003). In the present investigation satellite picture (IRS P6 LISS-III) or, in other words record of the different natural assets data on the base guide.

These guide indicating spatial dispersion of timberland, farming, soil, water assets and so on., and arranged by visual translation of the satellite symbolism. Visual elucidation is completed base on the picture attributes like tone, estimate, shape, design, surface and so forth in mix with existing guide/writing. These pre-field topical maps are adjusted substantiated and affirm after field checks. Topical maps readiness stream diagram is indicating drawback.

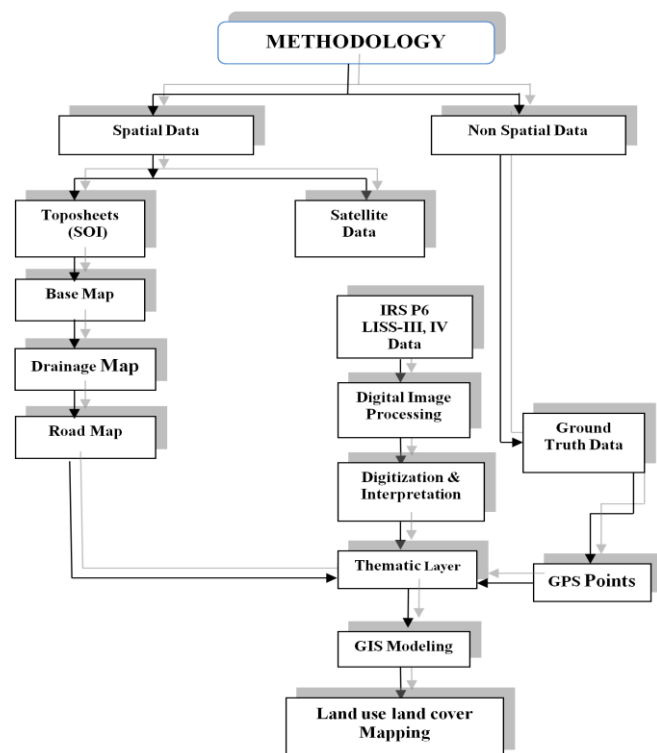


Fig.1 Methodology of the study area.

III.RESULT AND DISCUSSIONS

1. Analysis of Land use /Land covers using Geo-Spatial Technology-The land utilize/arrive cover classifications of the examination territory were

mapped utilizing IRS P6 LISS-III information of 1:50,000 scale. The field check, the guide was settled. The different land utilize and arrive cover classes in the investigation zone incorporate, Built-up land, developed land, woods arrive, uncultivated terrains and water bodies.

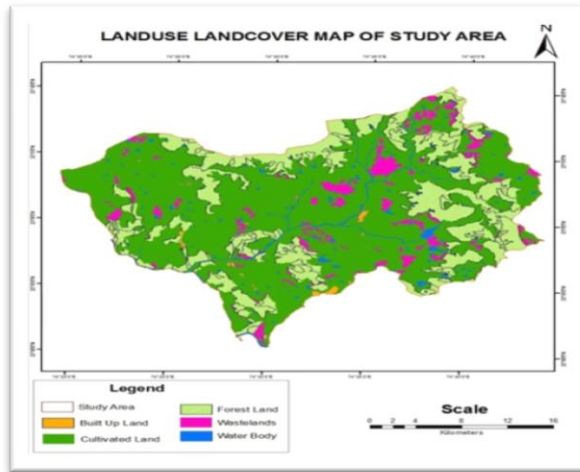


Fig.2 Land use/ Land cover map of the study area.

Table 1 land use Land cover classification system.

Level 1	Area in Sq/Km	% of the area
1. Built Up	4.21	0.51
2. Cultivated Land	516.79	63.18
3. Forest	226.50	27.69
4. Water bodies	21.52	2.63
5. Uncultivated Land	48.92	5.98
Grand Total	817.93	100.00

Detailed accounts of these land use and land cover classes of the study area are described in the following section.

2. Built up Land-Built up land is composed of areas of concentrated with much of the land covered by structures included in this category are cities, towns, villages, industrial and commercial complexes and institutions. In the study area major towns or villages are Thandla, Meghnagar, Rambhapur, Petlawad, Bhagor, Kakanwani, Agral and other small villages are include in study area but here is not namely describe. Meghnagar town is developing very hasty for industrial purpose. One is major mining area in Kajalidungari where is Manganese, Asbestos and Dolomite activities and second is around 3 Km away from Kajalidungari

where is Phosphates production. Built up land is covered total area of 4.21 Sq/km out 817.93 Sq/km.

3. Water bodies -The water bodies incorporate both normal and man-made water include in particular Rivers, Streams, Lakes, Tanks and supplies. The water highlights show up in dark tone on satellite symbolism. The shallow water and profound water highlights show up in light blue to dull blue in shading. Tank with ranch distinguished by the square/square shape and red shading tones. Tanks without ranch are perceived by the shape and light blue to dim blue tone A major river Pat flows in the study area and small water body are noticed in the vegetation area. Shivsagar dam is in situated in Thandla tehsil. Tanks are for the most part gathered in the North West and South East parts of the investigation zone with few dry tanks scattered around in the center parts of the examination region.

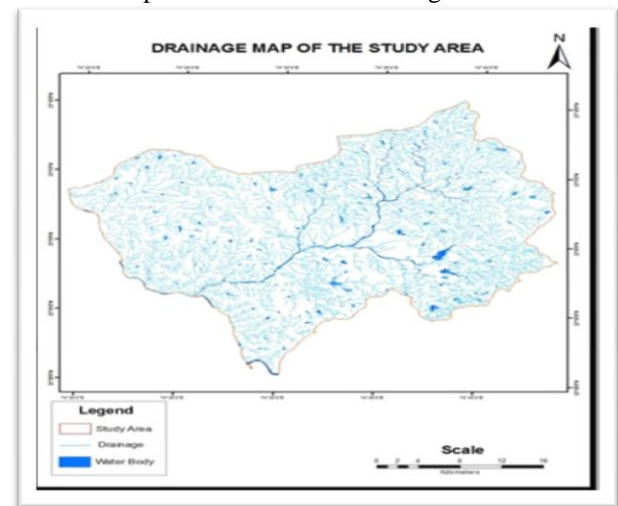


Fig.3 Drainage map of the study area.

4. Cultivated land-All the developed land with or without products plantation and ranches are considered in this class. This land utilize class is additionally subdivided into two sub-classes they are wet land (trim land) and dry land (decrepit land). Product lands are the farming terrains under harvest in the examination region. The product lands have wet development and dry development. includes trees orchards, groundnut etc and the area which have this type of cultivation is noticed at Thandla, Petlawad and Raipuriya. Cultivated land condition is good and more than half per cent of the area has covered out of the total study area.

These are the areas with standing crop as on the date of satellite overpass. Cropped areas appear in bright red to red in color with varying shape and size in a contiguous to non-contiguous pattern. They are widely distributed in different terrains. Three cropping seasons exist in the study area, Kharif (June to Oct.), Rabi (Nov to March) and Zaid (April to May).

5.Forest Land-Forest, comprises of thick and dense canopy of trees These lands are identified by their red to dark red tone and varying in size. They are irregular in shape with smooth texture. The forests are found on the north western and southern part of the study area. The study area covers mostly the dense and open forest.

6.Uncultivated Land-Land, which does not support any vegetation are known as uncultivated lands or Waste lands. Barren rocky, salt affected land, land with and without scrub, sandy area, sheet rocks and stony regions include in this category. Such lands are formed due to the chemical and physical properties of soil, temperature, rainfall and local environmental conditions. In the study area uncultivated lands are present in the north western part and some pitches are found in east to southern part of the study area.

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IV.CONCLUSION

The study has classified as per the major land use/land cover types. The India Remote Sensing Satellite (IRS) data, image processing and Geographical Information System techniques were used to identify the land use categories such as built-up lands, cultivated land, forest lands, water bodies and uncultivated lands. Satellite pictures in mix with originated before topographic sheet of Survey of India were utilized for breaking down land utilize and arrive cover change recognition. It is useful for future large scale and small scale level arranging. With the assistance of Geographical Information System the different land utilize and arrive cover zones are mapped, which thusly helps for chief for arranging reason. The developed terrains are all around disseminated all through the investigation zone and it covers 516.79 Sq/km. furthermore, sharing around 63.18

percent of the aggregate land utilize arrive front of the examination zone. Woodland involves 226.50 Sq/km (27.69 percent). The developed land involves 4.21 Sq/km. (0.51 percent) and there was a fast development of developed grounds. A water bodies involve 21.52 Sq/km.(2.63 per cent) and uncultivated which is include waste lands covered 48.92 Sq/km. (5.98 per cent).

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