

Land use / Land cover Analysis of Upper Darna River Basin Using Remote Sensing and GISDr. Anilkumar R. Pathare¹Prof. Jyoti A. Pathare²

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ABSTRACT:

Land is important and central non-renewable resource for all primary production system. The present study emphasises to find out the land use/land cover analysis of upper Darna river basin in Nashik district of Maharashtra. For understand the land use and land cover pattern of upper Darna basin, remote sensing and Geographical Information System (GIS) techniques provide reliable and precise information than the conventional methods. The existing land use pattern is derived from Landsat 8 OLI, 2012 USGS satellite image. The ERDAS software is utilized to demarcate and evaluate the land use/land cover characteristics of Darna river basin. The land use/land cover is not only demonstrates the physical condition but also economical situation of any region, which mainly determines the living standard of people and natural resources found in a study area. The land use/land cover of Darna river area consists of agriculture land, barren land, built-up land, forest, scrub land and water bodies are prepared by using the satellite imagery. The study shows that most of the area dominated by waste land such as barren and scrub land. Nearly (67 %) area covered by barren and scrub land followed by forest which covered 62.21 sq. km. (17.6 %) of the study area. The present paper provide a detailed account of the existing land use in upper Darna river basin and it signifies its importance in proper land use planning for further sustainable river basin management

Keywords: Land Use, Land Cover, Darna River Basin, Remote Sensing, GIS

Introduction:-

Land is one of the important natural resource like other natural resources such as water, air etc. Land cover refers to the surface cover on the ground, whether vegetation, urban infrastructure, water, barren land or other. Identifying, delineating and mapping land cover is important for global monitoring studies, resource management, and planning activities. Now a day land use and land cover becomes a central component for managing natural resources and environmental changes. Understanding landscape patterns, changes and interactions between human activities and natural phenomenon are essential for proper land management and decision improvement. Satellites data are very applicable and useful for understand the characteristics of land use/land cover studies (Yuan et al., 2005; Brondizio et al., 1994). The present paper is focus on land use/land cover analysis of Darna river basin which is very essential for better understanding of land use planning and sustainable river basin management.

Study Area:-

The study area extends between 19°36' N to 19°48' N latitudes and 73°39' E to 73°44'E longitudes which comprises the area of Darna river upper catchment and it covers around 389.6 sq. km. area. Darna river is one of the tributaries of Godavari river in Nashik district of Maharashtra state. It rises on the northern slopes of Kulung hill at elevation 1040 meters in Sahyadri ranges about 13 km south-east of Igatpuri Tahsil. The Darna river with its total length of 50 km. and is characterised by dendritic type of drainage pattern.

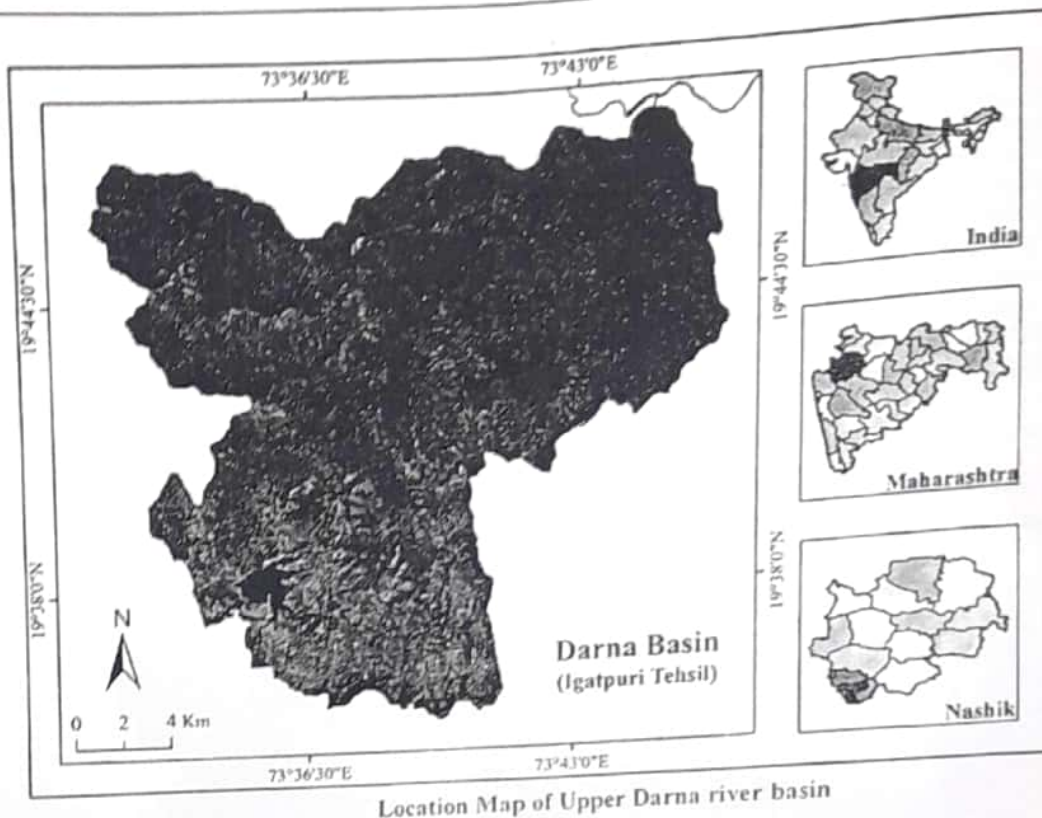


Fig.- 1:

Objectives:-

- To study land use and land cover analysis of upper Darna basin.
- To assess spatial distribution of land use land cover of study area.

Methodology:-

The upper Darna basin area covered in the Survey of India (SOI) Toposheet numbers 47 E/9, 47 E/10, 47 E/13 and 47 E/14 based on 1:50000 scales and USGS satellite image Landsat-8 OLI, 2012 used for obtain the present land use and land cover information of upper Darna river basin. ERDAS software is used for processes and supervised classification has been adopted to classify land cover segments such as agricultural land, built up, forest and wasteland.

Results and discussion

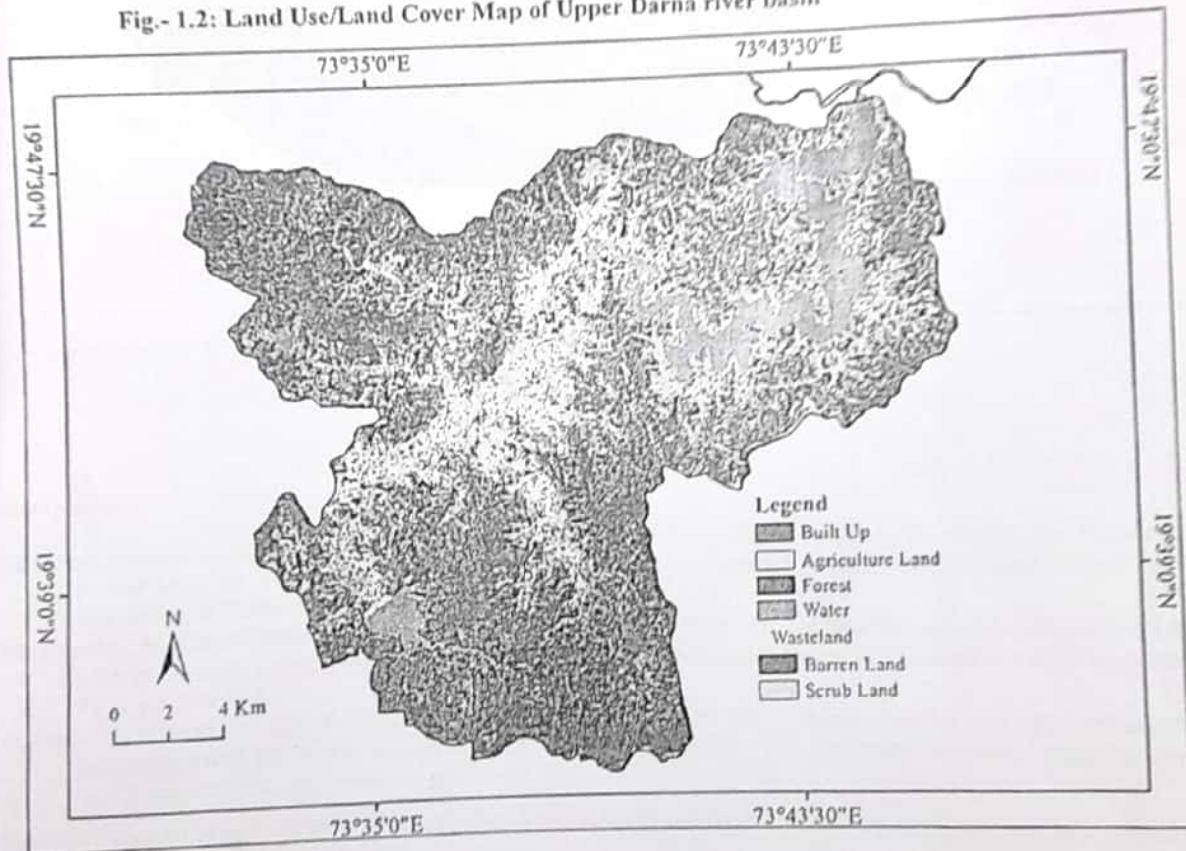
To analysis of land use and land cover of upper Darna river basin remote sensing data has been carried for the year 2012. Present study area mainly covered by agriculture land, barren land, built-up land, forest, scrub land and water bodies. These categories of land use and land cover are mainly mapped using USGS satellite image Landsat-8 OLI, 2012. Detailed classifications of land use and land cover of upper Darna basin excluding Darna lake area is as follow:

Table 1: Land Use/Land Cover of Upper Darna river basin

Sr. No.	Land Cover	Area in Sq. Km.	Area (%)
1	Agriculture land	46.36	13.11
2	Barren	191.20	54.09
3	Built up	1.29	0.36
4	Forest	62.21	17.60
5	Scrub land	47.02	13.30
6	Water bodies	5.43	1.54
Total		353.51	100

Present study mainly focuses on land use and land cover types of upper Darna river basin. With the help of remote sensing and GIS, land use categories such as agricultural land, built-up land, forest, waste land (scrub and barren) and water bodies has been identified (fig-1.2). It shows that most of the area dominated by waste land such as barren and scrub land. Nearly (67 %) area covered by barren and scrub land followed by forest which covered 62.21 sq. km. (17.6 %) of the study area. Built-up area covered only 1.29 sq. km. area of the total study area it indicates that upper Darna basin not much more influenced by human activities. 46.36 sq. km area covered by agriculture land in which paddy cultivation is dominated activity (Tabel-1 and fig.-1.3). The major water bodies in the study area are Darna river, its tributaries and some lakes. Darna river is the major source of water in this area. More proportion of scrub and barren land (Waste land) exhibits that study area has lack of proper land management. Present paper is useful to understand the characteristics and spatial distribution of land use and land cover in upper Darna basin. It can be refer for proper land use management as well as other natural resource management and integrated river basin management of Darna.

Fig.- 1.2: Land Use/Land Cover Map of Upper Darna river basin



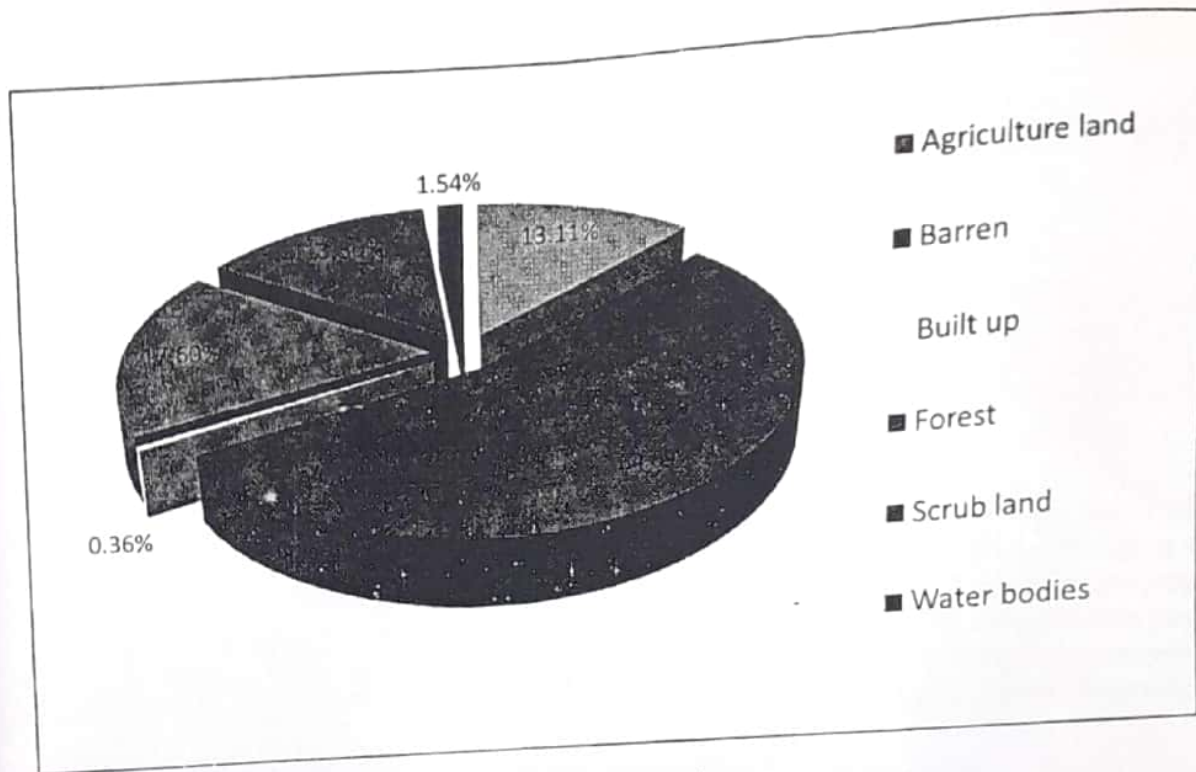


Fig.- 1.3 Land use / Land cover

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