



Original Article

Application of GIS with Remote Sensing Technique in Land Use and Land Cover Changes in India

Dr. Tilekar Sharad Balasaheb

Associate Professor & Head, Dept. of Geography,

Shrimant Bhaiyyasaheb Rajmane Mahavidyalaya, Mhaswad, Tal- Man, Dist- Satara

Affiliated to Shivaji University, Kolhapur.

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Correspondence Address:

Dr. Tilekar Sharad Balasaheb
Associate Professor & Head, Dept. of
Geography, Shrimant Bhaiyyasaheb
Rajmane Mahavidyalaya, Mhaswad,
Tal- Man, Dist- Satara. Affiliated to
Shivaji University, Kolhapur.
Email: sharadtilekar.1972@gmail.com



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Abstract

Land is our great heritage and continues supply the lifeblood of our civilization and national existence. Land use defined to the land utilization of various activity such as crops, forest, water bodies, waste land etc. Developmental activities such as construction, manufacturing, as well as certain agricultural activity requires large amount of data. Today the growth of population increasing rapidly in the world and it leads to increasing in consumption of land resource. Today, in the world as well as in India collection of such type of data are more difficult in less time. The satellite remote sensing data proved to the changes with in less period of time. Therefore, this paper marked significant importance in land utilization.

Keywords: Remote sensing, GIS, resources consumption, domestic activity. Introduction

Introduction

Today, land is our great heritage and continues supply the lifeblood of our civilization and national existence. The efficiency of land in a region is determined by the interaction of physical, socio-economic and technological factors. This type of study is essential for the selection, planning and implementation various schemes and to know the basic demands of human welfare. But the collection of the type of data is more difficult in less time. The satellite remote sensing data with the respective nature with the help of GIS technique have proved to be quite useful. Therefore, this study has been made land use changes in the period of 2018-19 and 2022-23.

Study Area

India is the seventh largest country in the world. it covers 2.47 % of the total land area of the world having 3287263 sq. km land. Its latitudinal extend is between 80 4' 28" north to 370 6' 53" north and longitudinal extent is from 680 7' 33" east to 970 25' 47" east, means India located in Northern hemisphere. It is bonded to the north by Himalaya and south by Indian Ocean, southwest by Arabian Sea and south east by Bay of Bengal. India divided in to the 28 states and 7 union territories for the administrative purpose. Objective: - The present investigation devoted to the land use and land cover changes of India from the period of 2018-19 to 2022-23.

Data Base and Methodology

The present study is based on spatial data of remote sensing and no -spatial data obtained from National Remote Sensing Centre from Hyderabad. The multi temporal satellite data used for the purpose of analysis of IRS AWiFS sensor on 1:250000 scale. In order to changes in the land use and land cover in the study area, multi temporal AWiFS sensor data have been used, during the study period from 2018-19 to 2022-23. For the analysis of object divided in seven classes. Change Rate (%) = Area of Current Year - Area of Previous Year X 100. For the result obtained the percentage converted into the degree and changes shown by divided circle. Land cover refers to the activities which are natural and manmade like as natural vegetation, water bodies, rock and soil etc. Finally, the land use and land covers means the different type of uses of land.

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Land Use and Land Cover Changes (2018-19 & 2022-23)

The fallow land bears negative growth with the increasing tendency of agricultural land.

The area under water bodies increases but neither sufficient rate. The forest land area shows negative growth rate. The waste land area reduced within study period. The snow cover land also reduced. The land under built up area observed expansion of settlement. However, the land under different categories is as follows.

Agricultural Land

In this category includes that the land under different crops over the season. in the study area. The most of land under kharif crops. The area under rabbi crops during the study period observed less due to the low rainfall. But the area under double crops marked increasing trend due to the farmers turn to attention towards the cash crops.

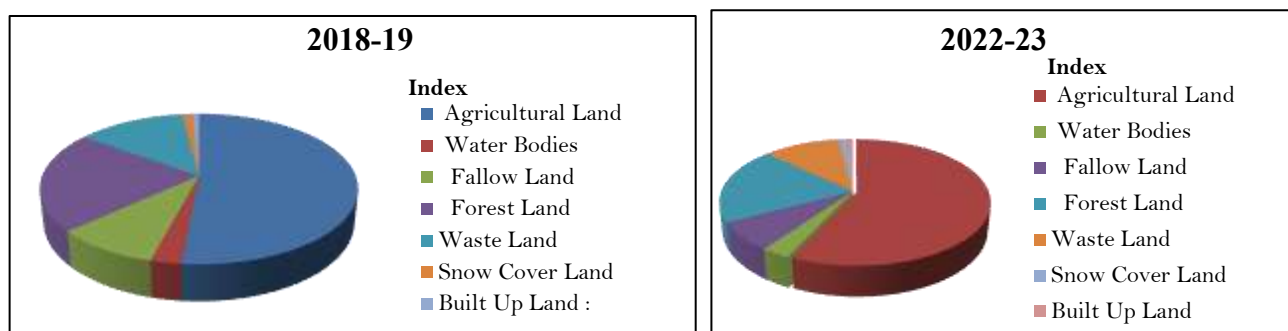
Table No. 1

Land Use and Cover in India 2018-19 & 2022-23

Sr. No.	Category	2018-19	2022-23	Annual Change Rate in %
1	Agricultural Land	51.42	55.32	3.90
2	Water Bodies	2.67	2.87	0.20
3	Fallow Land	9.09	7.11	-6.91
4	Forest Land	21.74	19.22	-2.52
5	Waste Land	12.98	10.63	-2.35
6	Snow Cover Land	1.26	1.13	-0.13
7	Built Up Land:	0.74	0.92	0.18

Source: - Compiled form by Author.

Land Use and Land Cover in India 2018-19 & 2022-23



Water Bodies: Water bodies were included lake, ponds, streams, and rivers. During the study period the area under water bodies increased due to the fluctuation in the rainfall over the study period.

Fallow Land: The fallow land covers the land under the hilly region and drought prone area. This type of land observed in decreased tendency. The negative change shows the double plantation crops are increased.

Forest Land: The land under forest covers the forest area. i. e. evergreen forest, semi evergreen forest, mangrove, grassland, and land under scrub. The land under different type of forest decreased due to the different manmade activity plays significant role on the burden on the forest.

Waste Land: This category includes the land under desert, gullied and other waste land. The area under waste land observed decreasing, with the increasing the population burden. The area under waste land decreases due the population growth.

Snow Cover Land: The land under snow cover observed changes in negative trend in the hilly region mainly in the Himalaya. This had because global warming witnessed the decrease in snow cover land.

Built Up Land: This category directly related to the population and different type of developmental activity. The land under rural and urban settlements marked the positive growth over the study period.

Conclusion

Today the growth of population increasing rapidly in the world and it leads to increasing in consumption of resource. And the different types of data are required in the action plan of development as well as disaster management. But such type of data collection with in fewer periods is more difficult. But the satellite remote sensing data with the respective nature with the help of GIS technique have proved to be quite useful of land use and land cover patterns and changes with in less time. Therefore, the technique of GIS and Remote Sensing are more significant. Finally it is concludes that the GIS and Remote Sensing are better tool future of coming generation.

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Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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