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Study of Land Cover types in Nandurbar Tehsil

Dr. Rahul V. Patil

Abstract

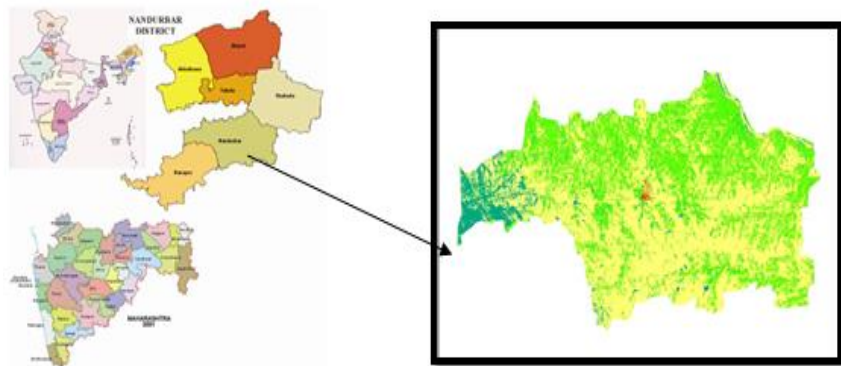
Understanding the land cover pattern is not merely an academic exercise; it forms the bedrock for discerning the inherent utility of specific land parcels and, perhaps more crucially, for tracing the evolutionary trajectory of a landscape over time.¹ Indeed, this analytical lens offers profound insights into the intricate interplay between pervasive human activities and the persistent forces of natural processes, revealing how they collectively sculpt and redefine our terrestrial environment. This prolonged scrutiny is not arbitrary; it is designed to systematically assess the dramatic transformations that have reshaped the land, driven by a confluence of influential factors. These include the unrelenting push of agricultural expansion to feed growing populations, the inexorable creep of urban development as community's density, the widespread repercussions of deforestation on local ecosystems, and a spectrum of other evolving land use practices that leave an unmistakable imprint. By undertaking a rigorous comparative analysis of high-resolution satellite data harvested from both the initial year of 1999 and the conclusive year of 2022, the study aims to illuminate the most pronounced shifts in land utilization. More than just identifying these changes, it seeks to articulate their potential environmental impacts, ranging from alterations in hydrological cycles and soil degradation to biodiversity loss and the disruption of vital ecological services, thereby painting a comprehensive picture of the region's evolving environmental health.

Keywords: land cover, agriculture, population, satellite data, urban, transformation

Introduction

In the given research, the researcher has studied various land cover types in Nandurbar tehsil to understand the spatial distribution and changes in land use over time. Advanced techniques such as Remote Sensing (RS) and Geographic Information System (GIS) were employed to accurately identify and map different land use categories, including water bodies, vegetation, agricultural land, barren land, and settlements. The analysis revealed that there have been drastic changes in these land cover types over the study period, indicating significant transformations in the region's landscape. These changes may be influenced by factors such as population growth, urban expansion, agricultural intensification, and environmental degradation, which have collectively altered the natural and built environment of the tehsil. Major land cover changes have been found in this study especially with the help of RS & GIS technique. Nandurbar tehsil is developing region hence land use is changing rapidly. This study also shows future land cover patterns of study area.

Location of Study Area:



Database & Methodology:

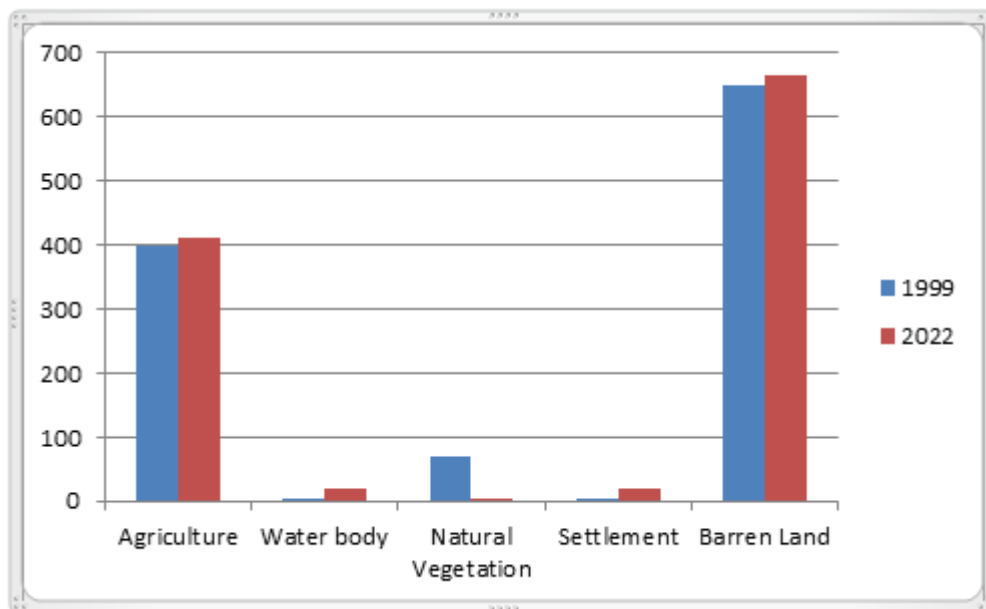
In this research, Landsat satellite imagery of Nandurbar tehsil from the years 1999 and 2022 was employed to examine the changes in land cover types over a span of more than two decades. The satellite data underwent a series of remote sensing processes to ensure accuracy and clarity. These included image correction techniques to remove geometric and atmospheric distortions, histogram equalization to improve visual contrast, and supervised classification methods to distinguish and categorize various land cover types such as vegetation, water bodies, agricultural land, barren areas, and built-up settlements.

The entire analysis was conducted using sophisticated GIS (Geographic Information System) software tools, which facilitated precise mapping, identification, and quantification of land cover categories. Following classification, the area occupied by each land use type was calculated for both years, enabling a clear comparative assessment of how land cover has changed over time due to natural or human-induced factors.

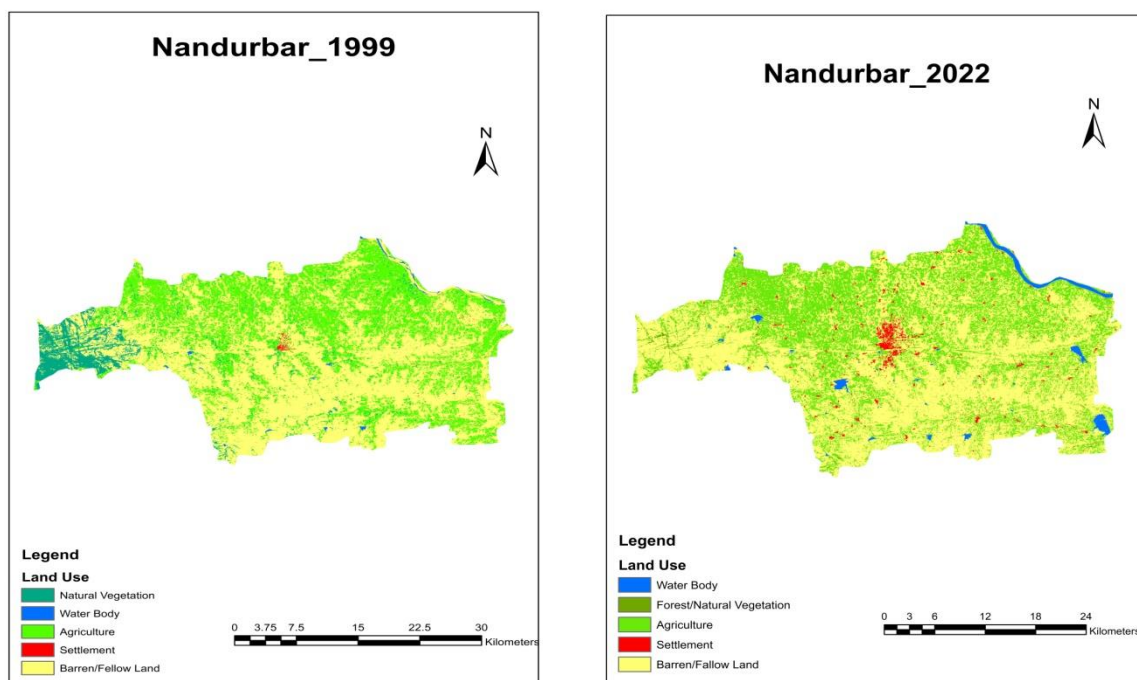
Results:

Nandubar Tehsil Land Cover (1999 & 2022):

Land cover Type	(Area in Sq. km.)	
	1999	2022
Agriculture	397.9133166	412.6221317
Water body	3.610984365	19.59301113
Natural Vegetation	69.05528649	5.020606173
Settlement	3.674996202	21.03414103
Barren Land	648.1729434	664.1303038
Total	1122.400194	1122.400194



The above table & graph presents a comparative analysis of land cover types in Nandurbar tehsil for the years 1999 and 2022, showing notable changes in land use over the 23-year period. Agricultural land has increased from 397.91 sq. km in 1999 to 412.62 sq. km in 2022, indicating a rise in farming activities, possibly due to population growth or expansion of cultivable land. Water bodies have significantly expanded from 3.61 sq. km to 19.59 sq. km, which could be attributed to the construction of reservoirs, improved water management, or seasonal changes. In contrast, natural vegetation has drastically declined from 69.05 sq. km to just 5.02 sq. km, suggesting large-scale deforestation, land clearing for agriculture or settlement, and environmental degradation. Settlements have grown markedly from 3.67 sq. km to 21.03 sq. km, reflecting urbanization and infrastructure development. Barren land has also slightly increased from 648.17 sq. km to 664.13 sq. km, indicating expansion of unproductive or degraded lands. Despite these individual changes, the total area remains constant at 1122.40 sq. km, affirming that the changes are due to conversion between different land cover types within the tehsil. This data highlights a significant transformation in the region's land use pattern, primarily driven by human activities.



Conclusion:

From the above study, it has been clearly shown that the area under agriculture and settlements has increased significantly over the years, indicating rising human activity and land development in Nandurbar tehsil. At the same time, there has been a noticeable decline in the area covered by natural vegetation. This suggests that agricultural expansion and urban growth may have occurred at the expense vegetated land. Such a shift in land use not only reflects changing economic and social demands but also raises concerns about the long-term environmental impact.

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Nil.

Conflicts of interest

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

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