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Utilization of GIS Technology in Urban Land-Use Planning: A Mumbai Case Study

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ABSTRACT

It discusses the integration of Geographic Information Systems in urban land-use planning, drawing from a case study example in Mumbai. The aim is to underline how GIS technology can support better planning processes, improved decision-making, and rising to the challenge of cities. This paper, therefore, tries to bring out certain views on some effective land-use strategies and their consequences on urban growth with the aid of an analysis of the data from different GIS applications.

INTRODUCTION

This forms the framework through which the growth and development of growing cities is managed. Geographical Information Systems have proved to be very powerful in supporting urban planners, as they provide the ability for spatial analysis and management of data, hence materializing the creation of informed decisions. This paper reviews the application of GIS in land-use planning, referring to a case study in Mumbai, India—a metropolitan city with rapid growth and many challenges in urban settings.AIM

Using Mumbai as a case study, the main goal of this research is to examine how GIS technology might be used to enhance land-use planning in urban areas. The goal of the study is to show how GIS may be used to solve planning issues and improve the effectiveness of urban development initiatives.

AIM

The overall objective of this study is to assess how GIS technology can be adopted as a means of exercising better land-use planning in urban settings; the case study is Mumbai. This paper attempts to show the suitability of GIS in making solutions for problems relating to plans and strategies for urban development more efficient.

OBJECTIVES

- Analysis of the role of GIS in urban land use planning processes.

- Assess the impact GIS has on decision-making and spatial analysis in Mumbai.

- The role of GIS technology with regard to the benefits and limitations involved in its application towards urban planning.

Offer recommendations on how to integrate GIS into land-use planning practices.

METHODOLOGY

1 DATA COLLECTION

This research used data originating from satellite imagery, GIS databases, land-use maps, and planning documents. The sources of the data were municipal records and research institutions, together with the GIS service providers.

2 GIS ANALYSIS

The GIS software used for these analyses included ArcGIS and Q. The main tasks include:

- * Spatial Analysis*: This talks about the land use patterns, zoning regulations, and infrastructure distribution.

- *Overlay Analysis*: The process of merging several layers of space data to determine areas that either conflict with each other or offer an opportunity to optimize land use.

- *Buffer Analysis: determining the effect of change in land use on surrounding areas.

3 CASE STUDY APPLICATION

The case study focused on a selected district of Mumbai, in which tools using GIS were strategically applied to analyze the present land-use practices in addition to examining planning issues state and to develop alternative land-use scenarios. The present land uses in the study area are analyzed on the following pages.

- Mapping the existing land use and infrastructure.

- Identification of problematic areas, including congestion, environmental deterioration, and inadequate public amenity output.

* Recommend GIS-based solutions to the identified issues.

RESULTS

The GIS analysis yielded a number of key findings:

- * Land-Use Distribution*: Information concerning the actual distribution of residential and commercial/industrial zones in Mumbai.

- * Planning Issues: Areas where congestion is high or green space is low.

- Proposed Solutions: It would suggest better land-use allocation, including generating new green spaces, and the rationalization of mobility networks.

DISCUSSION

The GIS technology applied to this research, in this regard, held immense potential for land-use planning in Mumbai. First of all, GIS made possible more accurate spatial analysis and improved visualization of the planning scenario. On the downside are issues pertaining to accuracy of data and integration with existing planning frameworks.

CONCLUSION

GIS technology offers itself a lot of powerful tools for urban land-use planning, yet at the same time, it allows more informed decision-making and efficient management of urban growth. The case study in Mumbai elaborates on both the benefits and limitations of GIS in practice. Future research is expected to focus on improving data accuracy and developing more integrated planning approaches.

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