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Comprehensive Land Use Planning for Peri-Urban Areas along the Outer Ring Road Corridor: A Case Study of Gosaiganj, Lucknow

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Abstract: ***Rapid urbanization in Lucknow's peri-urban regions has resulted in uncontrolled land conversion, environmental degradation, and infrastructure stress. This research focuses on Gosaiganj Block located along the Outer Ring Road corridor and proposes a comprehensive land use planning framework for sustainable peri-urban development. The study uses GIS-based spatial analysis, demographic assessment, field surveys, NDVI and LST analysis, and policy review to understand land use transformation patterns. The findings reveal increasing built-up areas, declining vegetation cover, and pressure on agricultural land. The study proposes integrated land use planning strategies including agricultural conservation, mixed land use development, green infrastructure, transit-oriented planning, and zoning regulations. The proposed framework supports sustainable, resilient, and balanced urban expansion.***

Keywords: ***Peri-urban development, Land use planning, Urban sprawl, GIS analysis, Sustainable development, Gosaiganj, Lucknow***

I. INTRODUCTION

Peri-urban areas represent transitional landscapes between urban and rural environments. Rapid urban expansion in Indian metropolitan regions has intensified land use transformation in peri-urban zones. Gosaiganj Block in Lucknow has emerged as a significant growth corridor due to infrastructure projects such as the Outer Ring Road and Purvanchal Expressway. The absence of coordinated planning has resulted in fragmented development, environmental degradation, and loss of agricultural land. This study aims to formulate a comprehensive land use planning framework to guide sustainable development in the study area.

II. AIM AND OBJECTIVES

The study aims to prepare a comprehensive land use planning framework for the peri-urban areas of Gosaiganj Block, Lucknow. The objectives include analysis of existing land use patterns, assessment of environmental indicators, evaluation of demographic and infrastructure conditions, and formulation of planning and policy recommendations for sustainable development.

III. LITERATURE REVIEW

The literature review highlights the importance of integrated land use planning in peri-urban areas. Studies from Poland, Bangladesh, Indore, and Hyderabad demonstrate that transportation corridors significantly influence land transformation. Research emphasizes GIS-based monitoring, zoning regulations, environmental conservation, and participatory planning approaches.

IV. STUDY AREA PROFILE

Gosaiganj Block is located in the southeastern part of Lucknow district along the Lucknow–Sultanpur corridor. The study area is influenced by major infrastructure projects and is experiencing rapid residential and commercial growth. Historically agricultural, the area is now undergoing rapid peri-urban transformation.

V. METHODOLOGY

The research uses a mixed-method approach involving GIS analysis, field surveys, stakeholder interaction, demographic analysis, and policy review. Primary data were collected through land use surveys and field observation, while secondary data included census records, satellite imagery, master plans, and government reports.

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VI. LAND USE AND ENVIRONMENTAL ANALYSIS

The study reveals increasing built-up land and declining agricultural and vegetative areas between 2020 and 2025. LST analysis indicates rising surface temperatures associated with urbanization, while NDVI analysis shows decreasing vegetation cover. Major issues identified include poor infrastructure, environmental degradation, and unregulated development.

VII. SWOT ANALYSIS

The study area possesses strengths such as strategic connectivity and development potential. However, unplanned growth, weak zoning enforcement, and environmental stress represent significant weaknesses. Transit-oriented development and mixed land use planning provide future opportunities, while speculative land conversion remains a major threat.

VIII. PROPOSED LAND USE PLANNING FRAMEWORK

The proposed framework emphasizes agricultural protection, mixed land use development, integrated transportation planning, green infrastructure, and decentralized economic development. The proposed land use distribution aims to achieve balanced growth and environmental sustainability.

IX. POLICY RECOMMENDATIONS

The study recommends stronger zoning regulations, land pooling mechanisms, protection of green belts, institutional coordination, and sustainable infrastructure planning. Participatory governance and GIS-based monitoring systems are also recommended for effective land management.

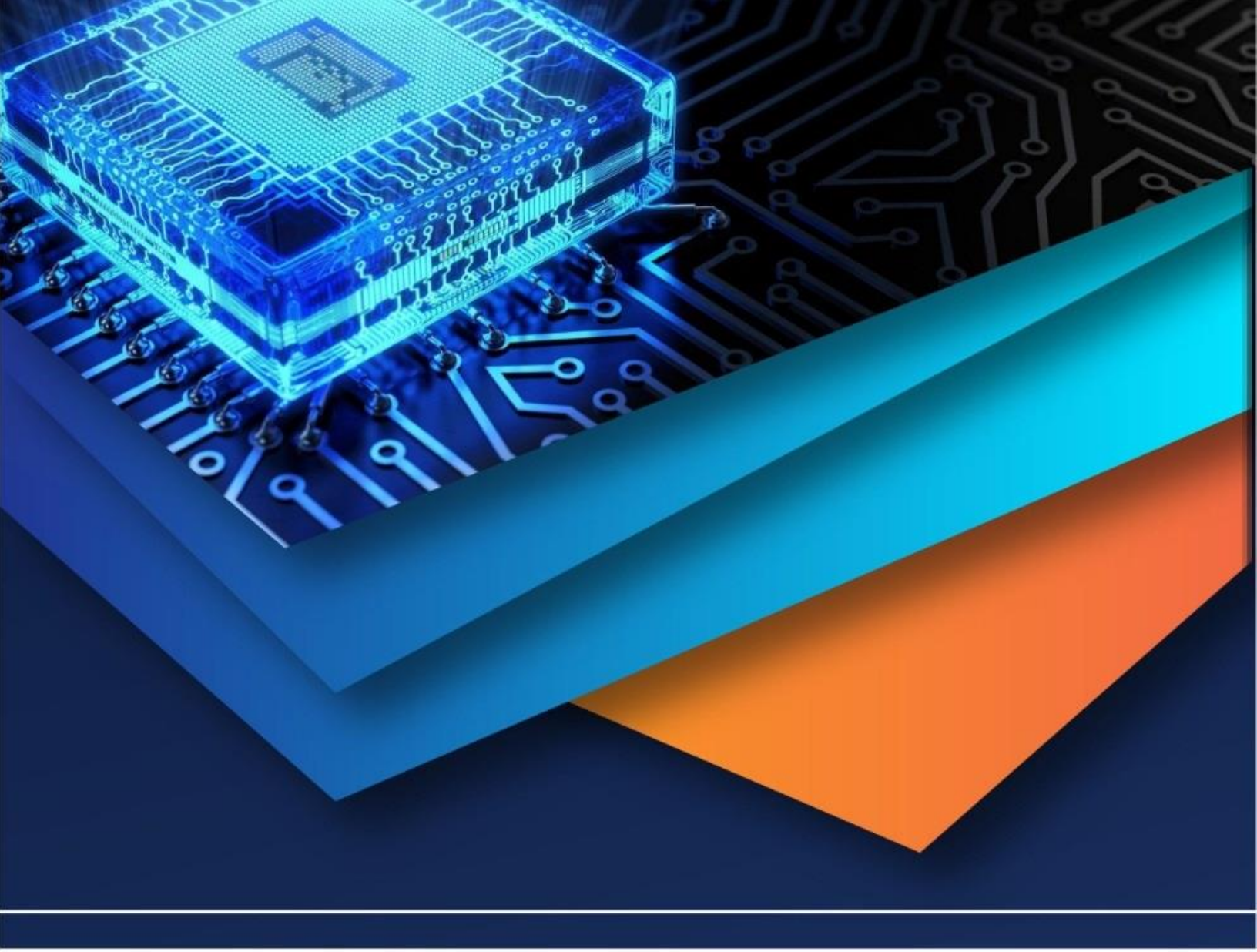
X. CONCLUSION

The study demonstrates that peri-urban regions require integrated and proactive planning strategies to manage rapid urbanization. The proposed planning framework for Gosaiganj Block provides a sustainable model for balancing development, environmental conservation, and socio-economic growth.

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