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Urban Green Space Management and Planning: A Case Study of Bhubaneswar

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Abstract: ***This study examines the management and planning of urban green spaces in Bhubaneswar, India, focusing on the challenges and opportunities. Using a combination of quantitative and qualitative research methods, the study examines the current status of green spaces in Bhubaneswar.It examines distribution, accessibility, and quality, and analyzes policies and practices. Key issues include unequal distribution, lack of maintenance, and encroachment. Recommendations include a comprehensive plan, increased public participation, and sustainable landscaping practices to address these challenges.***
Keywords: Urban green space, Sustainability, Functionality, Management, Open space

I. INTRODUCTION

Human involvement in nature has been a fundamental aspect of human society, affecting economic and cultural aspects. As the population grows, the challenge of providing a satisfying living environment becomes more significant. Spatial analysis can help identify areas with high air pollution levels for planting trees or creating green corridors to mitigate pollution effects. Similarly, if a high population density area has few green spaces, spatial analysis can help identify new parks or community gardens. This approach can help policymakers and city planners prioritize the development of green spaces in Bhubaneswar, ensuring their positive impact on the health and well-being of urban residents. By utilizing this approach, they can prioritize green spaces that maximize their positive impact on urban residents.

II. NEED OF THE STUDY

This topic aimed to to evaluate the current status of urban green space understand the challenges faced and propose sustainable strategies for their effective management. The following objectives are; to evaluate the contemporary conditions of urban green space in Bhubaneswar, to investigate the challenges and opportunities in green space management, to formulate recommendation for optimizing urban geen space planning and management.

1) Urban green space benefits can be maximized through proper planning, design, and evaluation.
2) Local authorities are responsible for protecting and maintaining green spaces.
3) Green spaces and nature-based solutions enhance urban quality, promote sustainable lifestyles, and improve health and wellbeing by reducing environmental hazards and mitigating extreme weather impacts.
4) Public green space must be easily accessible and equitably distributed within the city to serve as health promoting settings.

III. EXPECTED OUT COMES

1) The conservation and expansion of urban green spaces can be hindered by conflicting land use demands and interests.
2) To address this, green space management and planning considerations should be integrated into urban development plans and policies.
3) This will foster sustainable and equitable urban growth patterns.
4) Additionally, habitat-rich green spaces can enhance urban biodiversity and ecosystem services.
5) A monitoring and evaluation framework can track the effectiveness of green space management and planning efforts.

IV. RESEARCH METHODOLOGY

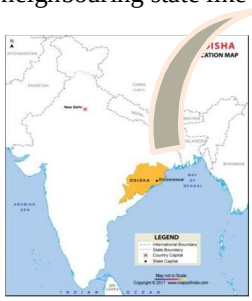
The following steps are followed in the study: 1. After doing the background study and issue identification aim and objective was finalized. 2. Literature review was done by doing a through analysis of previous research, identifying the status of urban green space, Impact on Public Health, Benefits, challenges and principle of urban green space, Management Strategies. Giving articles with empirical data or case studies from various cities or regions a higher priority.

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Including case studies that talk about increasing urban green space, strategy, to improve quality of life in cities, cooling approach to the cities. 3. Data collection was done by primary and secondary data collection method. Primary data was collected by noting the current situation and making field observations.in field observation, different types of green spaces such as parks, gardens, street greenery, and vacant lots. Secondary data was collected by Compiling present information about understanding of existing research and theoretical frameworks related to urban green space management and planning, to obtain data on policies, regulations, and statistics related to urban green spaces. 4. Data analysis Determine the most common types of green spaces (parks, gardens, community spaces). challenges and opportunities in green space management, encroachment and degradation.5. Gap analysis was done by determining the scope, including the specific aspects of urban green space management and planning to be analysed.

V. FIELD OF STUDY

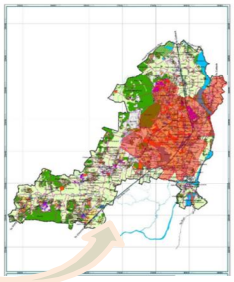
Bhubaneswar is the Capital city of Odisha, located in Khordha district. It covers an area of 186 sq. Km. The city is physically located in the Eastern Coastal Plains and is bordered to the south and east by the Daya and Kuakhai rivers, respectively. According to the 2011 Census of India, Bhubaneswar has a population of 0.88 million and had grown at a rate of 34.51% between 2001 and 2011. It is connected through National Highway 16 linking, Balasore in the North and Berhampur in South, National Highway 316 linking to Puri.as Bhubaneswar has numbers of well-known multispecialty hospitals and universities. Peoples from across the state and different districts and neighbouring state like West Bengal depend on it.



Map 1: Showing Odisha in India Map.

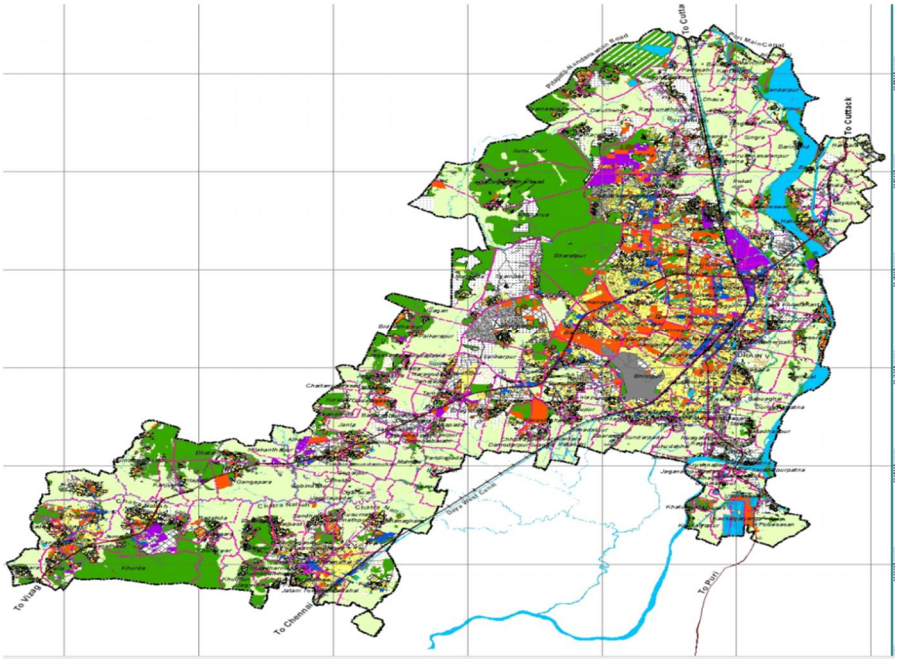


Map 2: Showing Khurda in Odisha Map.



Map 3: BDPA area 2010

Figure 1 showing, India, Odisha, Bhubaneswar



Map 1: showing the land use map of bdpa area

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VI. RESULT AND DISCUSSION

A. *Status of ugs in Bhubaneswar*

1) The total area of urban green spaces in Bhubaneswar is 495.1 hectares, excluding water bodies.
2) Indian standards recommend 1.4-1.6 hectares for recreational use, below the National Recreation and Park Association standard of 4 hectares per 1000 population.
3) Government-developed neighborhoods have more useable open space than private land holdings.
4) However, 10% of the Old Town areas have less open space due to less available land for public utilities.
5) The central part of the city has grid-iron neighborhoods with pockets of open spaces, but government ownership consumes over 70% of the land.
6) The vacant lands left for open spaces are not developed as usable parks, despite city-level parks.

B. *Benefits of urban green space:*

1) Urban green spaces offer numerous benefits, including reducing heat island effects, noise pollution, and preserving natural areas within cities.
2) They also reduce energy costs, provide insulation, and increase the aesthetic value of cities.
3) Additionally, they provide recreational space, reduce stress, and boost mental and physical health, satisfying citizen's needs.

C. *Plants used for green space:*

1) The city of Bhubaneswar has been implementing a green space plan, which includes planting shrubs, hedges, and flower plants in medians.
2) However, the city has faced challenges due to cyclones, with 50% of trees being chopped in May 2019.
3) The department granted permission for the felling of around 4000 trees in 2019-22.
4) The expansion of roads and buildings has also led to the felling of trees.
5) Various species, such as neem, peepal, jamun, patuli, jackfruit, Kanchan, Ashok, naga Champa, and babul, have been planted due to their longevity, wind resistance, and adaptability to the local environment.

D. *Discussion*

1) The centres of the city lack in green spaces and also the south-eastern part of the city have some wards which lack green space.
2) The eastern and south-eastern parts of the city have adequate green spaces.
3) Agricultural land and vegetation are being seen in decreasing direction between 2001 - 2021, while Built-up and waterbody are being seen in increasing direction.
4) As per the data built-up covered the most land in BMC (28.79% in 2001, 42.76% in 2021)
5) The highest reduction was reported in green space, with a loss of 26.47 sq. km (2001-2021).
6) agricultural land likewise shown a definite downward trend, shrinking at a pace of 0.22 sqkm each year.

E. *Issues*

1) Fragmentation and attrition of green space prevailing in all part of Bhubaneswar city.
2) The spatial distribution of green space is not uniform in the city.
3) The green space of the city is not functionally integrated with the land use.
4) Most of the street plantation is carried out by urban forestry wing are uneven.
5) The street trees of the city altogether missing the maintaince.

VII. CONCLUSION

Urban green space management in Bhubaneswar is crucial for sustainable development and quality of life. With rapid urbanization, preserving and expanding green spaces is essential for improved air quality, reduced heat island effects, enhanced biodiversity, and recreational opportunities. Effective policies and community involvement are needed to ensure these spaces are well-maintained and accessible. Prioritizing green infrastructure can build a resilient urban environment supporting ecological health and human well-being.

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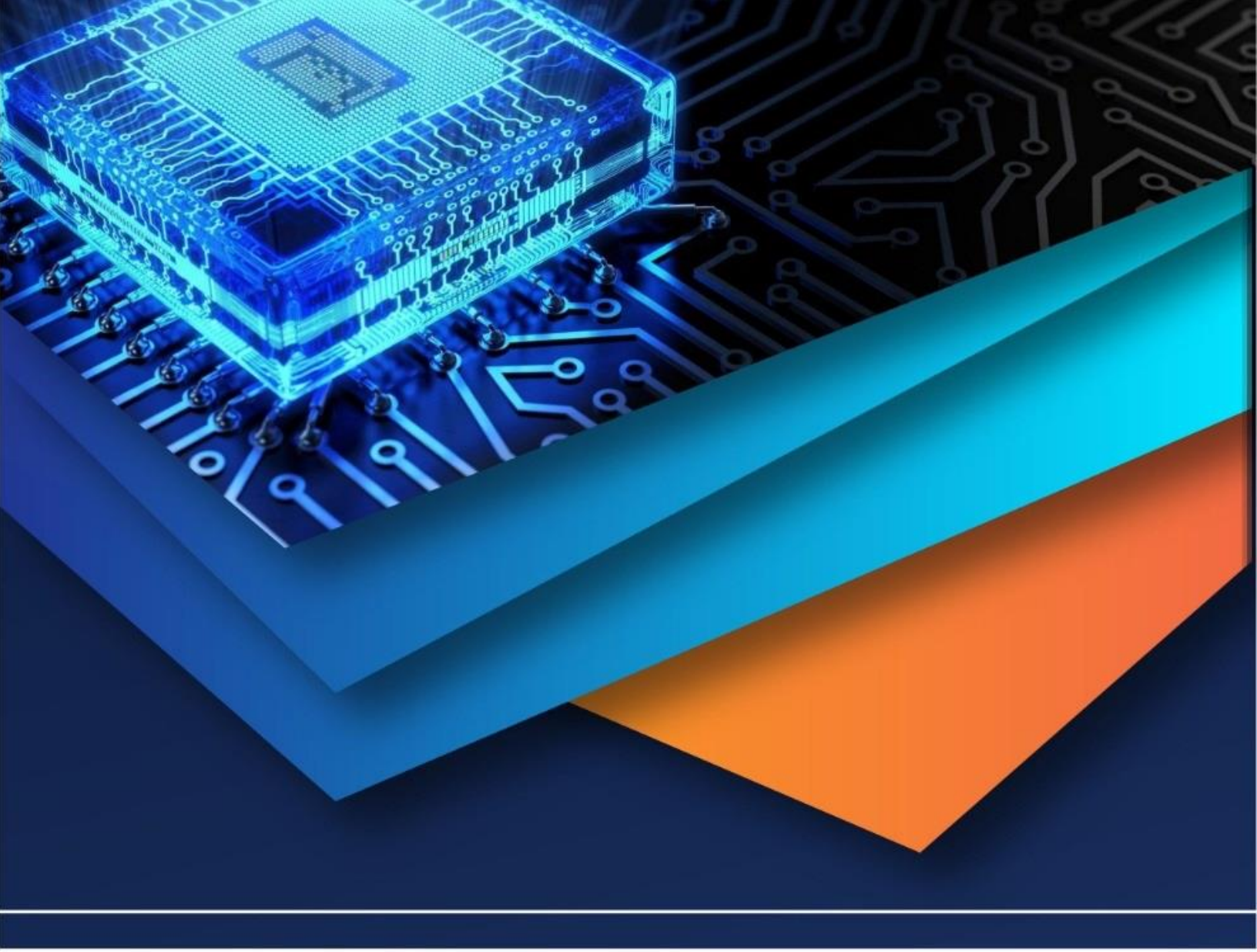
VIII. RECOMMENDATION

1) Evolve appropriate mechanism to protect the road side trees from urban development.
2) Evenly distribute the green cover across the city by regulating the development.
3) Formulate multifunctional framework for development protection, conservation and restoration of natural areas.
4) Increase the appropriate planting along city's road which could respond onsite conditions.
5) Evolve appropriate ordinance to reduce the conflict between the tree and other urban utility lines in the streets.
6) Evolve the public vacant spaces at the fringes into green bells to overcome the need of the city. control pollution, and help in climatic changes.

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