CHAPTER 54

Development-Centric Urban Regeneration for Socio-Economic and Environmental Revitalization

Komal Handore[1] and Avanti Ingole[2]

ABSTRACT

Urban regeneration has emerged as a transformative process for revitalizing cities that address urban areas socio-economic, environmental degradation, and infrastructural challenges. This research focuses on Yavatmal, a mid-sized city in Maharashtra, India, historically dependent on agriculture which faces issues such as economic stagnation, infrastructural deficits, and social disparities. The research aims to formulate a holistic urban regeneration strategy tailored to Yavatmal's needs emphasizing context-specific solutions by integrating Geographic Information Systems (GIS) and Multi-Criteria Decision-Making (MCDM) techniques. The study employs GIS for spatial analysis, mapping underutilized infrastructure, and assessing regeneration potential, while MCDM facilitates prioritization of interventions based on sustainability, economic feasibility, and stakeholder inputs. The focus lies on fostering socio-economic revitalization, environmental sustainability, and enhanced infrastructure utilization to improve urban livability and social cohesion. This approach aligns with Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 8 (Decent Work and Economic Growth). The study emphasizes the importance of dormant infrastructure assets, creating economic hubs, and targeted skill development as key strategies to boost employment opportunities and economic growth. The research adopts a phased implementation approach that balances short-term goals with long-term sustainability with metrics to assess the impact of these initiatives on quality of life and socio-economic growth. This research not only provides actionable solutions for the city but also offers a replicable model for similar urban centers in India facing similar challenges largely overlooked how urban regeneration can transform underutilized resources, enhance socio-economic conditions, and create resilient, vibrant, and inclusive cities, contributing to sustainable urban growth.

Keywords: Urban regeneration; MCDM; Sustainable development, Socio-economic revitalization, Environmental degradation, Community resilience

1.0 Introduction

Urbanization is a characteristic of the contemporary age. Globally, two billion additional people are expected to live in cities between 2000 and 2030.

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Thus, cities today serve as the centers of almost 80% of global economic activity (Wahba *et al.*, 2019). The United Nations predicts that by 2050, over 70% of the world's population will reside in urban areas (Kumara, 2018). In most urban settings, the infrastructural base is insufficient to support this increase in population (Wahba *et al.*, 2019). Due to rapid urbanization, significant changes have occurred in urban areas, which have a significant impact on the environment and the spatial structure of the city. Currently, 54% of the population resides in urban areas (Kumara, 2018). Rapid industrialization and urbanization are now significant drivers of environmental degradation and have forced metropolitan areas to handle a large increase in population (Kumara, 2018). The conversion of agricultural land, increased pollution, congestion, decreasing open spaces, and inadequate infrastructure are all problems associated with urbanization (Kumara, 2018).

Urban regeneration is an effective response to the increasing demand for land use and infrastructure, which promotes more rapid urban growth (Wahba *et al.*, 2019). Urban regeneration is used to revitalize deteriorating cities, enhance socioeconomic conditions, and ensure environmental sustainability (Neves *et al.*, 2024). Sustainable urban regeneration is the rebuilding of urban spaces and the repurposing of their resources. (Li *et al.*, 2024). It focuses on action, policy, and process interventions in urban areas to mitigate socio-economic challenges by reducing environmental risks, ecological footprints, and the overall quality of the environment within urban systems (Li *et al.*, 2024). Supporting urban regeneration initiatives aids in reimagining a second life for underutilized urban areas and deteriorating communities (Romanelli *et al.*, 2022). Successful urban regeneration requires thorough planning and active involvement from every stakeholder involved.

1.1 Evolution of urban regeneration strategies and policies

Urban regeneration has its roots in the 19th-century industrial revolution, which emphasizes the need for structured city planning. In the post-war period, reconstruction in cities and the economy, followed by deindustrialization, created a social void (Cerreta & Rocca, 2021). Since the 1940s, urban regeneration has been an approach used to combine social concerns with economic and physical growth. In the UK, policies to rebuild war-damaged areas and address the legacy of 19th-century slums were implemented and were similar to U.S. urban policies (Magalhaes, 2015). During the late 1960s and early 1970s, the UK introduced policies that matched the modern urban regeneration concepts (McCarthy, 2016). In the 1970s, the concept of urban regeneration emerged as a policy area to improve social inclusion, boost economic activity, and restore environmental quality in deteriorating neighborhoods (Magalhaes, 2015).

Cities began to realize their significance in both regional and national economies in the late 1980s (Cerreta & Rocca, 2021). In the late 1990s, regeneration policies in the UK returned to area-based initiatives with a greater focus on addressing housing, healthcare, education, employment, and public space improvements through targeted intervention (Magalhaes, 2015).

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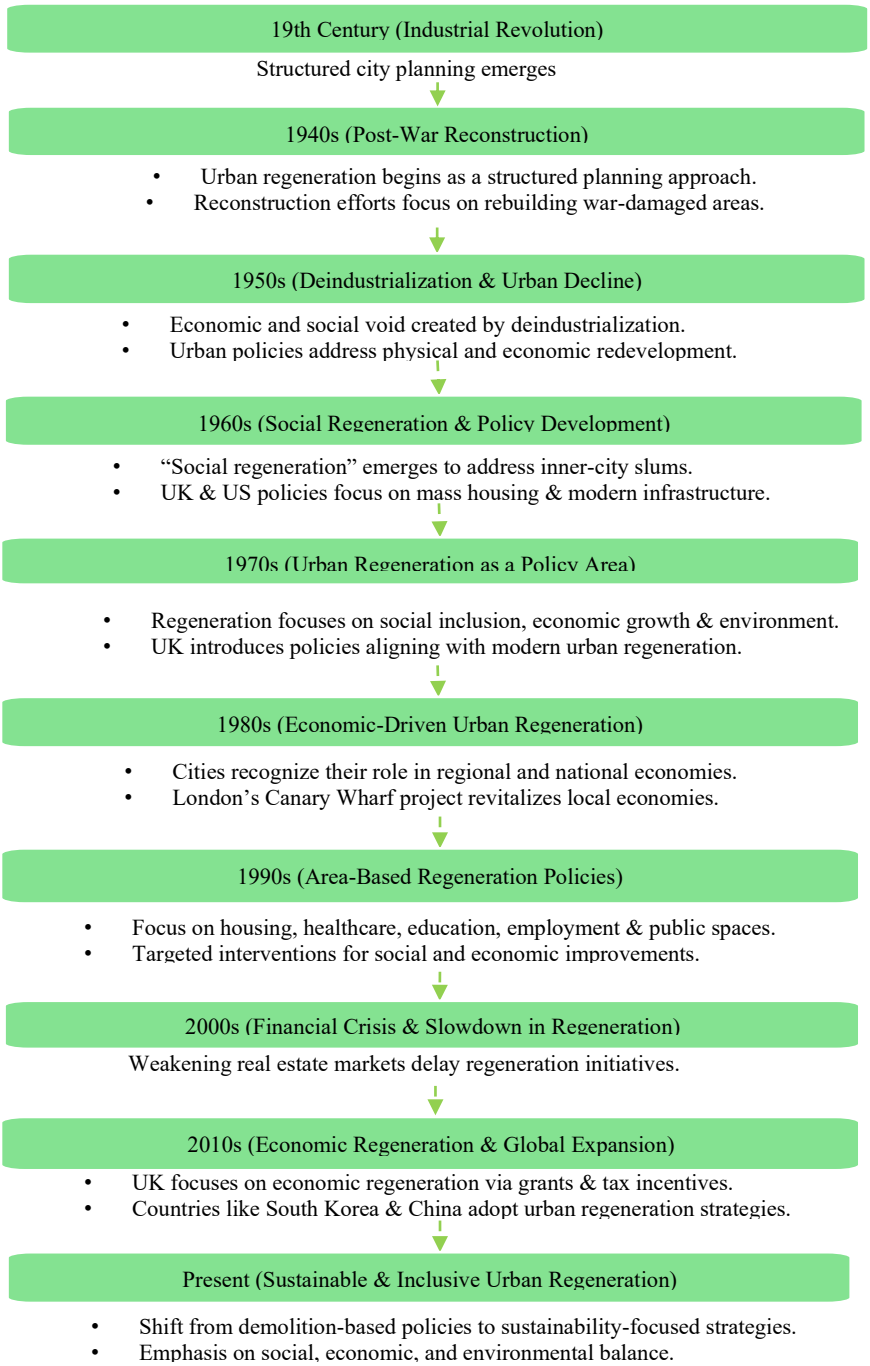
Figure 1: Decade-wise Evolution of Urban Regeneration Policies and Strategies



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The majority of regeneration initiatives in the UK and Europe were delayed down by the financial crisis of the mid-2000s because of the weakening real estate markets (Magalhaes, 2015). In 2010, the UK coalition government prioritized economic regeneration via grants and tax incentives for funding projects that increased employment and the economy (Jones & Evans, 2013). Recently, countries like South Korea, which industrialized rapidly and experienced rapid, unplanned urbanization, have pursued urban redevelopment policies (Shin, 2009). China is looking for solutions to stop the urban deterioration brought on by its fast urbanization (He & Wu, 2007). Although the policies frequently focus on destruction and reconstruction, they are becoming more aware of the limitations of this approach (Magalhaes, 2015).

Historically, Indian cities were defined by high population density within compact spaces and primarily nonagricultural livelihoods (Hawley, 1971). Despite the expansion of urban sprawl, inner-city neighborhoods which are frequently the oldest areas of a city face several social, economic, and environmental problems (Pankaj, 2018). Inappropriate land use, deteriorating infrastructure, pollution, congestion, and historical degradation are some of the factors that significantly affect the citizens' quality of life (Pankaj, 2018). Initiatives for regeneration, such as historical preservation in Jaipur, slum rehabilitation in Kolkata, and core area management in Delhi, are influenced by regional settings (Onkar *et al.*, 2008). Depending on the characteristics of a city, regeneration involves either at macro-level of the inner core or micro-level such as traffic operation plans, historic building conservation, and service upgrading (Onkar *et al.*, 2008). Several schemes were started in India, including the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), which was introduced in 2005 to improve urban development, infrastructure, and services.

Basic Services to the Urban Poor (BSUP), Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT), and Integrated Housing and Slum Development Programme (IHSDP) were among the sub-submissions that addressed urban poverty and inadequate infrastructure (Narkhede & Bura, 2022). Also, the Ministry of Housing and Urban Affairs has made significant progress, neighborhood-level policies that address environmental sustainability, social and economic progression, and failing infrastructure are necessary to revitalize urban areas (Narkhede & Bura, 2022).

1.2 Concepts in urban regeneration

Urban regeneration focuses on the concept of revitalizing outdated buildings, ancient structures, and neighborhoods. Redevelopment of brownfield sites and the revitalization of ancient structures are issues in global cities (Bratuskins *et al.*, 2020). In addition, the revitalization promotes the provision of diverse dwelling plans (Shawabkeh, 2018). It aims to address the growing needs of communities resulting from urbanization and population increase (Shawabkeh, 2018). Sustainable development is another important concept. The Sustainable Development Goals (SDGs) have a significant emphasis on social sustainability (Marta & Giulia, 2020). Socially sustainable urban regeneration focuses on economic, environmental, and

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social issues, thus it is in line with SDGs that aim to achieve well-being (SDG 3), reduce inequalities (SDG 10), build resilient, inclusive cities (SDG 11), and develop peaceful societies (SDG 16) (Marta & Giulia, 2020). Studies on social sustainability are still few, even though their significance has grown recently (Marta & Giulia, 2020). The revitalization of communities and neighborhoods is necessary to accomplish sustainable cities (Romanelli *et al.*, 2022). Urban regeneration enhances quality of life, fosters participation, and promotes sustainable development. Moreover, it can facilitate inter-organizational relationships between public and private organizations and facilitate urbanization (Romanelli *et al.*, 2022).

The focus on urban communities is another essential component of urban regeneration (Li *et al.*, 2024). Sustainable urban community regeneration uses sustainable methods to address issues like excessive consumption of energy and poor space quality, significantly contributing to urban growth. This approach, which focused on urban regeneration through improved maintenance methods, initially appeared in rich countries including the US, UK, and Japan (Li *et al.*, 2024). Adaptive preservation of cultural heritage sites' structures is another connected issue. Reusing heritage sites rather than destroying them is the goal of adaptive preservation. Since the majority of traditional settlements in India have lost their true value, this is a challenge (Vidyullatha *et al.*, 2023).

One of the most important policies for restoring ancient buildings and transforming cities is urban regeneration (Romanelli *et al.*, 2022). Adaptive use of old or historic structures can enhance the ecology, landscape, cultural identity, and local resources (Vidyullatha *et al.*, 2023). Although community involvement is essential for successful urban regeneration, its impact has not yet been investigated, and there is a lack of research that can clearly relate socioeconomic factors to outcomes (Chahardowli *et al.*, 2020). Secondly, the limited study on comprehensive research that brings capacity building together with community service delivery to vulnerable communities indicates the existence of an under-researched area that must be investigated (Cahantimur & Beceren, 2023).

This also suggests that the complexity of urban regeneration may not be adequately addressed by the existing study, which places a smaller focus on long-term sustainability and participatory techniques (Chahardowli *et al.*, 2020). The gaps need to be addressed to develop more effective and sustainable strategies (Vidyullatha *et al.*, 2023).

1.3 Purpose, aim and objectives

There has been significant research on urban regeneration, but this knowledge gap persists in the practical application of such frameworks in a particular context, particularly in small and mid-sized cities in India (Neves *et al.*, 2024). Despite having limited exposure, numerous authors continue to focus on large, large cities with advanced infrastructural and economic foundation (Said & Dindar, 2024). Successful intervention examples in recent years, such as the regeneration of ancient city cores, have provided cities the chance to improve their urban character and attract in investment (Chahardowli *et al.*, 2020).

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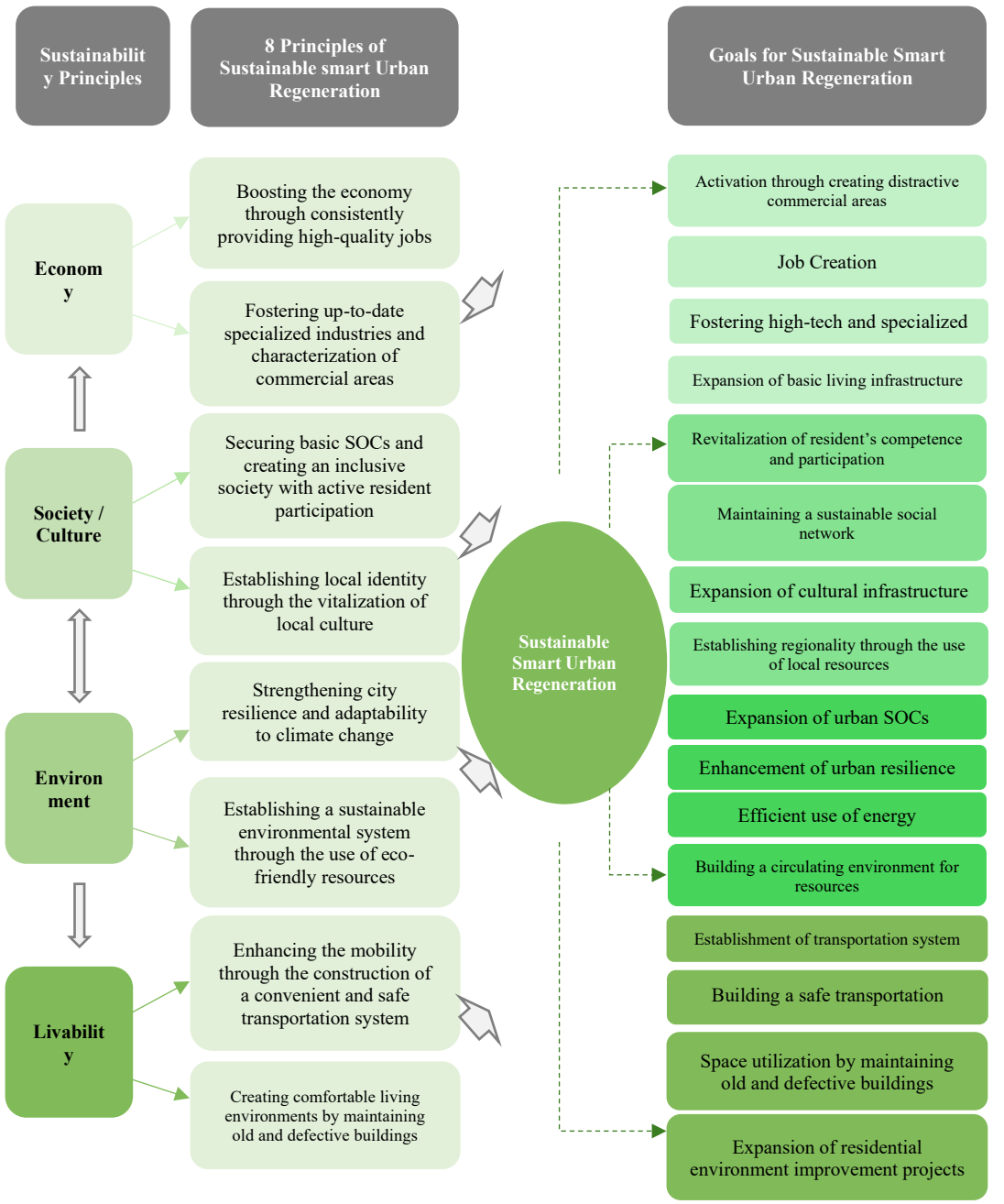
Figure 2: Principles of Urban Regeneration



Source: Enhancing Sustainable Urban Regeneration through Smart Technologies: An Assessment of Local Urban Regeneration Strategic Plans in Korea -Hyun Woo Kim

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Additionally, the Port of Rimini regeneration project's use of virtual reality to engage the community indicates that regeneration contributes to improvements in public space and quality of life (Belaroussi, 2023). This aspect of urban revitalization encourages resilience, livability, and sustainable development on a global scale, which eventually results in communities that are healthier and more vibrant (Romanelli *et al.*, 2022).

This study addresses the urban regeneration gap in smaller cities with socio-economic and infrastructure issues, with an emphasis on Yavatmal City, India. (Neves *et al.*, 2024). Yavatmal's urban landscape is defined by economic decline, poor infrastructure, and social issues that impede growth. To promote livability and community well-being, a comprehensive approach that incorporates affordable housing, green spaces, and smart infrastructure is needed (Chahardowli *et al.*, 2020). The city's reliance on agriculture has led to economic stagnation and outdated infrastructure, contributing to the issue. According to (Neves *et al.*, 2024) socioeconomic inequality and informal settlements are examples of unequal restoration.

Research that is especially focused on Yavatmal's needs would be required because there aren't many practical case studies of comparable situations. As demonstrated by the successful urban regeneration frameworks, it is essential to involve communities in the regeneration process to foster trust and enhance outcomes (Cahantimur & Beceren, 2023). Further, to improve urban resilience, environmental sustainability and socioeconomic revival must be integrated (Neves *et al.*, 2024). This research seeks to highlight some of the most pressing regeneration challenges, put forward new, innovative approaches in urban planning, and formulate standards to evaluate regeneration in terms of quality of life and socio-economic growth (Vidyullatha *et al.*, 2023). Challenges specific to Yavatmal make this case study the ideal opportunity to evolve step-by-step, feasible interventions in smaller Indian cities for their regeneration. The aim of this study is to formulate integrated urban regeneration strategies that would be based on socio-economic revival, environmental sustainability, infrastructure improvement, and cultural heritage preservation to make the Yavatmal livable, resilient, and conducive to community well-being.

The following research questions will be examined in order to achieve this aim:

- What are the key socio-economic and infrastructural problems facing Yavatmal, and how do these problems influence its development?
- How could GIS be applied to analyze the challenges and determine the effects of urban regeneration on Yavatmal's development?
- How can those frameworks from national and international contexts be adapted to achieve the specific needs of Yavatmal?
- To maximize sustainable urban regeneration in Yavatmal, how may MCDM approaches be applied to prioritize regeneration choices while taking stakeholder and community input into consideration?
- What new urban planning strategies, accompanied by smart infrastructure, green spaces, and affordable housing, can be used for regenerating Yavatmal?

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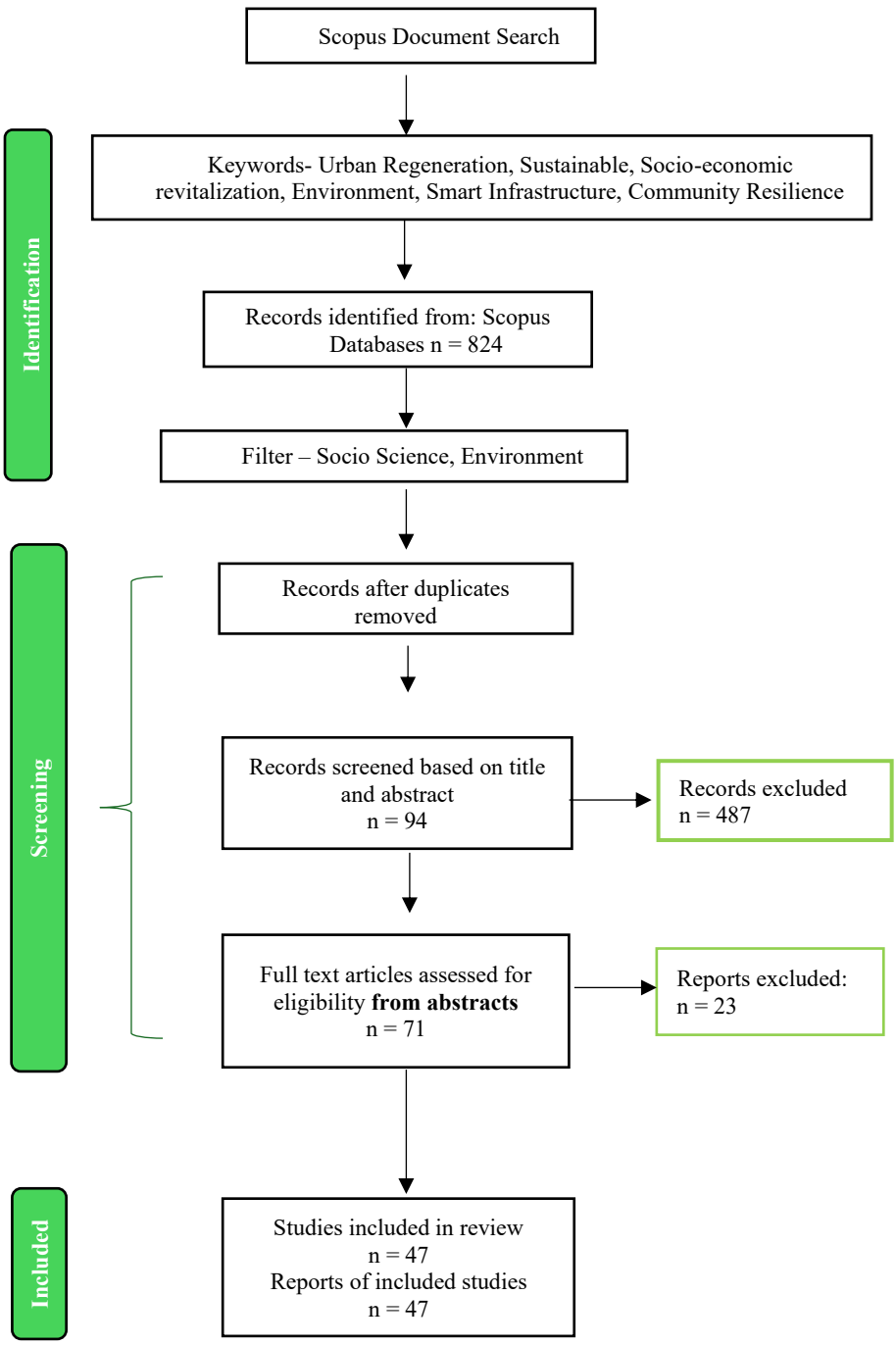
Figure 3: Literature Review Methodology



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This research uses GIS and Multi-Criteria Decision-Making (MCDM) techniques, it examines whether regeneration efforts may provide Yavatmal with an innovative perspective on the social, economic, and environmental aspects of life. By combining socio-technical viewpoints, the MCDM framework tackles the problem of prioritizing urban renewal criteria and enables the identification of the most feasible and well-rounded regeneration solutions (Manupati *et al.*, 2018). It ensures sustainable development that is economically feasible, environmentally responsible, and socially inclusive.

2.0 Methodology

2.1 Literature methodology

The literature review used the systematic approach by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards. To get a deeper understanding of a study issue, a strategy like this ensures a strict and transparent procedure in determining the appropriate research.

First, a search for keywords was conducted in the Scopus database. These included "Urban Regeneration, Sustainable, Socio-economic Revitalization, Environment, Smart Infrastructure, and Community Resilience". A total of 824 documents were found using the keyword search. Later, filters were used to make sure the research paper that was discovered would be relevant to the study's aim; specifically, the article was classified under the "Social Science" and "Environment" sections. Following the application of the filter, 581 papers were considered relevant and subjected to additional study, while 243 papers were eliminated. After then, the abstracts of those 581 publications were examined in order to determine which ones were relevant to the research. As a result, 94 publications that were in alignment were found.

To ensure their eligibility for consideration in the research, the complete texts of 71 publications were examined from the list based on 94 records that were chosen. As a result, 23 records were removed from the pool of eligible records. After a thorough screening and evaluation of eligibility, 47 studies made it into the final review. These studies served as the foundation for determining the main ideas and patterns in literature, which in turn provided light on the crucial elements of community resilience, sustainability, and urban renewal. This systematic approach allowed selection of relevant information that is not biased, and ensured the analysis was holistic enough to ensure that all the available current information was understood thoroughly.

2.2 Research methodology

The research methodology for this study follows a structured and systematic approach in addressing the identified research problem and achieving the objectives of the study (Shawabkeh, 2018). This study uses a mixed-methods research strategy, combining qualitative and quantitative techniques to provide an in-depth analysis of Yavatmal's regeneration process.

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While the quantitative method makes use of geographical analysis using GIS and Multi-Criteria Decision-Making (MCDM) tools, the qualitative approach concentrates on understanding socioeconomic and environmental concerns. Identifying the research problem is the fundamental stage in the research approach.

Next, the aim and objectives that determine the research's scope and direction are defined. A comprehensive literature review is conducted to analyze existing studies, reports, and research papers, thereby allowing the identification of research gaps, the need for innovation, and the novelty of this study. Yavatmal City's socioeconomic and environmental characteristics will be the primary focus of the research. This will act as an opportunity for concentrated regeneration initiatives.

The study combines primary and secondary research methods to ensure a comprehensive understanding of urban regeneration for environmental and socioeconomic revival, with a particular emphasis on Yavatmal. Primary data was gathered via structured questionnaires, and stakeholder perspectives were recorded. Secondly, data was gathered from reports, online websites, newspaper magazines, government officers and literature.

The study collects data using two methods primary Data and secondary data. The primary data is based on structured questionnaires that are used to directly gather both quantitative and qualitative data from stakeholders, such as citizens, government officials, and urban planners. Whereas, in secondary data the In-depth literature reviews will be an important source from previous studies, reports, and statistical data. Available geographic and demographic datasets, satellite imagery, land use maps, and policy documents will be procured from official government websites and the town planning departments.

The collected data will be analyzed to make relevant conclusions and will be analyzed as quantitative and qualitative data. The quantitative analysis helps to find trends, patterns, and correlations, numerical data from surveys will be processed. Survey data will be examined to find patterns and connections between urban issues and socioeconomic variables. Additionally, the distribution of public spaces, infrastructure problems, and land-use patterns will be mapped using GIS techniques. Whereas, the qualitative analysis helps to assess stakeholder perspectives and contextual elements, non-numerical insights from secondary sources and interviews are studied. Determine Yavatmal's advantages, disadvantages, possibilities, and risks about urban regeneration. The study identified urban regeneration alternatives for Yavatmal using a combination of GIS and MCDM approaches.

On the basis of land use, population density, infrastructure deficits, and environmental challenges, critical places are emphasized on GIS thematic maps. MCDM further prioritized options considering economic viability, sustainability, and stakeholder involvement. In order to solve socioeconomic and environmental issues, the research created focused, sustainable strategies that were in line with local development objectives. The findings offer a route to sustainable urban change by offering practical suggestions for urban regeneration.

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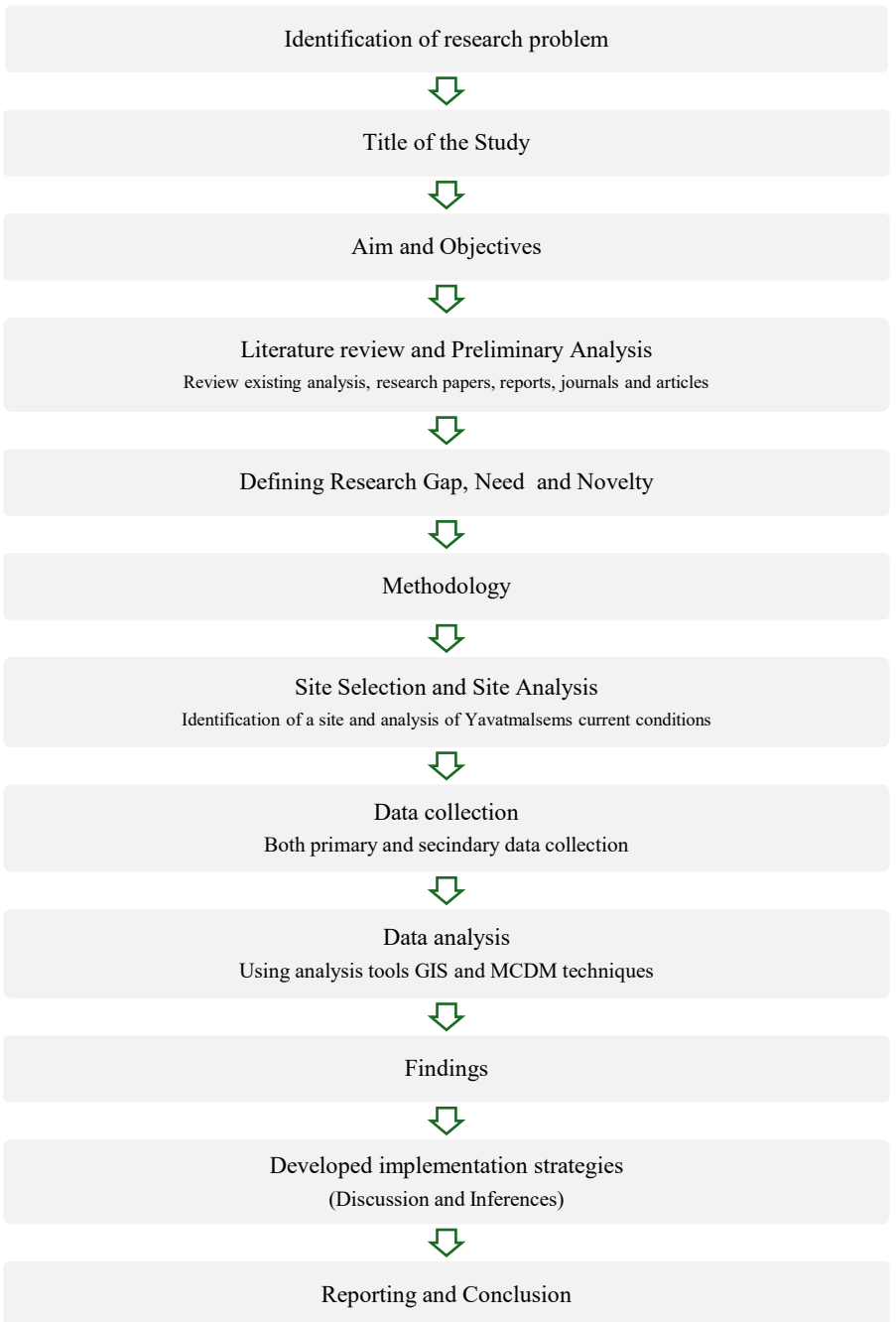
Figure 4: Research Design for Developing Urban Regeneration Strategies for Yavatmal



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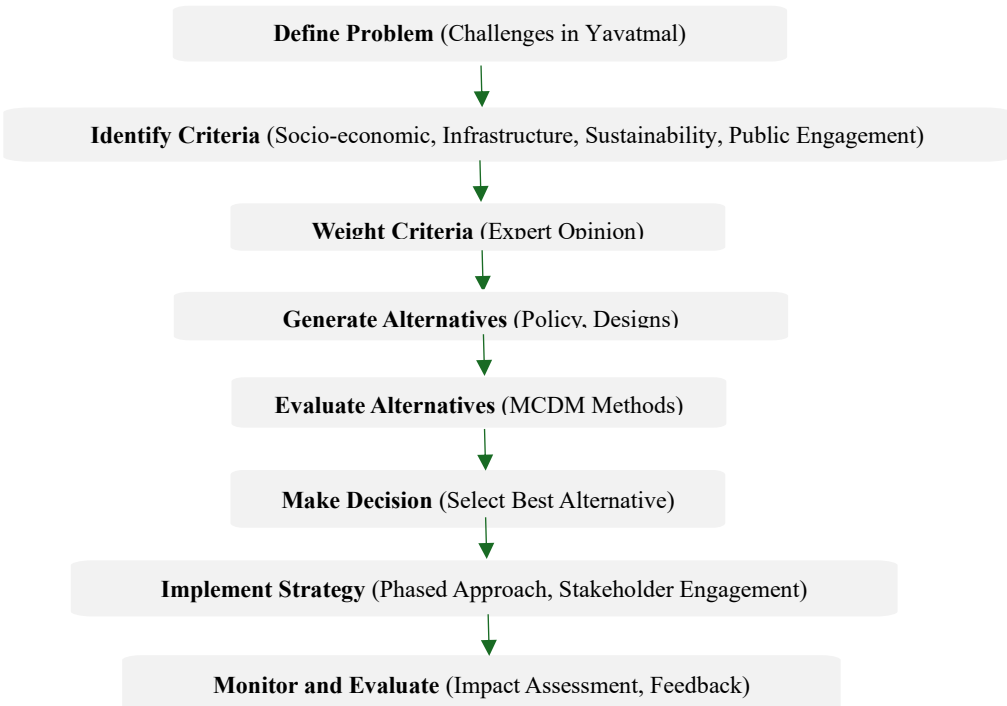
3.0 Tools and Techniques

Multi-Criteria Decision-Making (MCDM) and Geographic Information Systems (GIS) are two techniques that are combined in this study in order to develop a solid framework for addressing the needs of the development-centric urban regeneration of the Yavatmal. This approach would support the study's investigation of the feasibility of Yavatmal's regeneration strategy. By using these techniques, the study will help in the creation of initiatives that balance social, environmental, and socioeconomic issues in the Yavatmal.

3.1 MCDM framework

The MCDM method integrates each of these criteria, which include social inclusion, environmental sustainability, and economic feasibility, to achieve multiple objectives and make it easier to examine regeneration, alternatives.

Figure 5: MCDM Framework



The approach seeks to take into account the opinions of the numerous stakeholders, and as a result, the different techniques that have been selected and are relevant to the research study's objective are combined and also helping with addressing community needs. This

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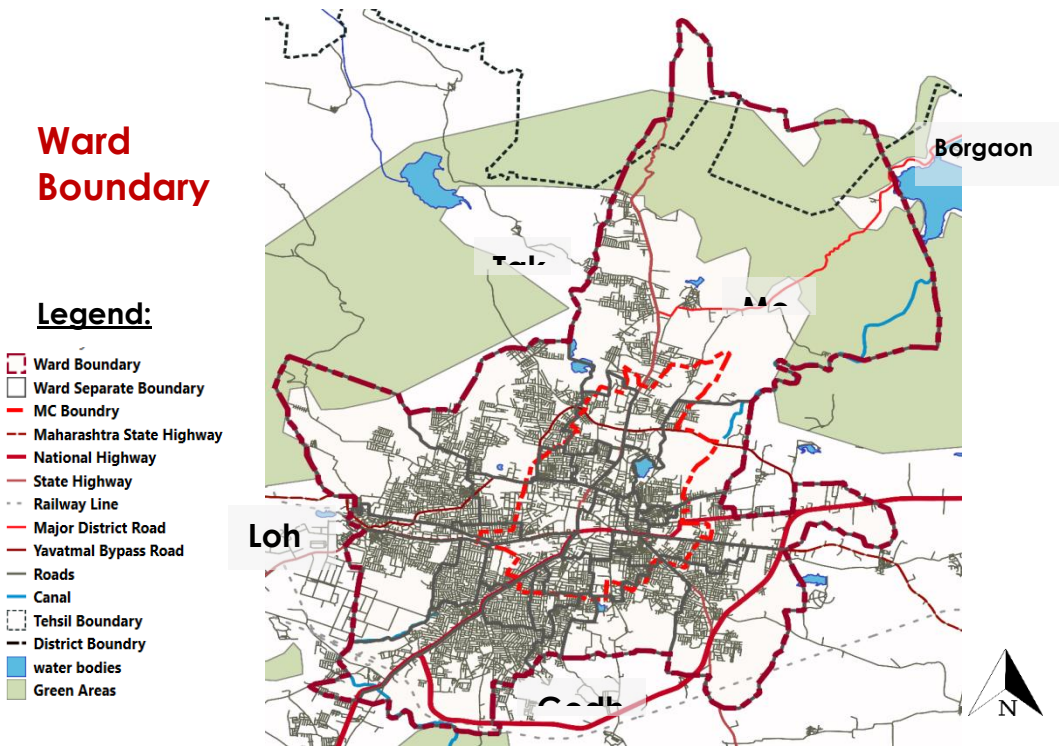
approach therefore encourages balancing the planned interventions. Urban regeneration in Yavatmal adopts an MCDM approach to tackle socioeconomic stagnation, environmental problems, and challenges related to insufficient and dormant infrastructure. The issues that have been brought forward are first identified, followed by recognition of the criteria for evaluation such as sustainability and socioeconomic impact, after which the weights are distributed according to the opinions. The MCDM technique rates potential solutions such as community-based projects and policy reforms. And in order to accomplish the long-term objectives of the selected plan, this approach first actively involves all stakeholders before continuing to support the monitoring and development of planning techniques.

This approach makes use of GIS tools, which are also employed in the identification of underdeveloped areas and the creation of green spaces and corridors to optimize the enhancement of transportation networks while simultaneously increasing community resilience. In order to achieve socio-economic renewal and support environmental preservation, the GIS framework and the MCDM are used in combination to provide sustainable urban redevelopment that is tailored to the requirements of the Yavatmal community.

Figure 6: Ward Boundary Map of Yavatmal



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4.0 Study Area

Yavatmal is a city and municipal municipality located in the eastern Indian state of Maharashtra. Yavatmal serves as the district's administrative center. The city is located about at latitude 20.3893° N and longitude 78.1303° E on the Deccan plateau area. Other districts are connected by the city. Amravati and Wardha districts border Yavatmal to the north, Chandrapur district borders it to the east, Telangana state and Nanded district border it to the south, and Washim and Hingoli districts border it to the west.

The Wardha-Painganga-Wainganga plains, which are characterized by hills, valleys, plateaus, and other characteristics, are one of the many geographical features of the Yavatmal. With a total size of around 13,582 square kilometers, Yavatmal district makes up 4.41% of Maharashtra state. The Yavatmal district's geography is separated into six distinct geographical zones. The Yavatmal Plateau, which covers the majority of the tehsils of Kalamb, Kalamb, Kelapur, and Ghatanji; the Bembla Basin, which is located in the northern parts of Ner and Babulgaon tehsils; the Pusad Hills, which are located in Pusad, Mahagaon, and Umarkhed tehsils; the Wardha Plain, which is located along the Wardha River in Kalamb, Ralegaon, Maregaon, and Wani tehsils; and the Penganga Valley, which is located along the southern district boundary.

Because of these geographical features and their characteristics, the Yavatmal region is distinct in terms of its varied terrain, development, and surroundings. The city of Yavatmal has 5585 households spread over 40 wards. Over the next few decades, both the population and urbanization will continue to rise due to the expansion and improvement of infrastructure. This represents the potential for both urbanization and economic growth characteristics. The district has a population of 2077144 and constitutes 2.63% of the state's total population. The population density is 153 persons per km2, which is much less than the overall population density of the state at 257 persons per km2.

Yavatmal district ranks 19th in terms of population and sixth in terms of area out of the 30 districts in the state of Maharashtra. With a decadal growth rate of 12.78%, the population of Yavatmal district increased from 1,822,942 in 1981 to 2,458,271 in 2001 and 2,772,348 in 2011. Yavatmal districts are mostly rural. The main source of income and livelihood for the local population is agriculture, which is also the main industry supporting the district's economy. Approximately 21.58% of its people live in towns. According to the 2011 census, Yavatmal City is home to 116,551 individuals. This figure will keep rising annually. It will be projected to reach 167,000 by 2025.

The demographics of Yavatmal are diverse and require significant improvement. Sex Ratio is slightly above the national average with 952 females per every 1,000 males. However, the sex ratio of children aged 0–6 is 922 girls for every 1,000 boys, suggesting that gender parity has to be improved. The overall average literacy rate in the district of Yavatmal is 82.82%, which is quite acceptable. The literacy percentage for women is 75.93%, whereas the rate for

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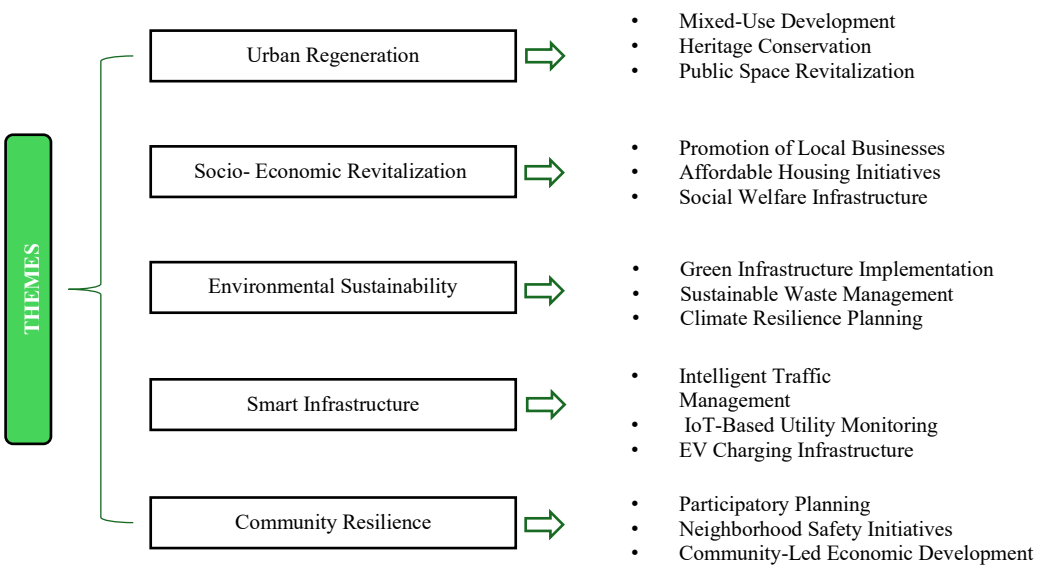
men is 89.41%. The fact that the literacy rate in rural regions is 80.47% while it is 91.24% in urban areas indicates that educational measures are necessary in the urban areas. With around 17% of the people belonging to scheduled castes and 5.61% to scheduled tribes, Yavatmal boasts a diverse social fabric. Diversity is beneficial for the district's cultural richness, but it also determines whether inclusive development and resource allocation are required.

The Yavatmal district's economy is still mostly based on agriculture, with cotton serving as the major product and economic activity. As a result, worker participation is significantly lower than in other districts. Yavatmal district is the area in Maharashtra where the most cotton is grown. In Yavatmal, agriculture employs more than half of the people. According to the 2011 census, Yavatmal Municipal Council employed 39,237 people. Of them, 93% were employed in major jobs, which is defined as employment that lasts more than six months per year, while the remaining 7% were employed in marginal work. Of these, 1,222 were cultivators, 457 were agricultural laborers, 734 were employed in home industries, and 34,087 were employed in other activities. As a result, there has been a steady shift in urban areas toward industrial and service-oriented occupations, indicating socioeconomic development.

Figure 7: Identifies Themes from Literature Review



Trade and trade are essential to the district's economy since Yavatmal is a cotton city and a major exporter of cotton, teak wood, nylon, limestone, and charcoal. Yavatmal offers a robust transit system that facilitates both travel and commerce. Cotton and jowar are two of the district's main crops. The Yavatmal region is extremely well connected by road, with several towns passing along state and national routes. Hence, the district imports all necessary goods

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from places like Nagpur, Pune, and Mumbai, including cement, food grains, machines, and medicines. Yavatmal, Pusad, Wani, Digras, and Pandharkawada are important commerce hubs. The significant roads that facilitate access are the Amravati-Chandrapur State Highway and the Nagpur-Hyderabad National Highway. Yavatmal lies on the Nagpur-Tuljapur State Highway. Rail connectivity is restricted to narrow-gauge lines, including the Yavatmal-Darwha segment, which is mostly utilized for the movement of commodities. This means that to serve the district's expanding urban and industrial demands, rail and road connectivity must be improved.

Due to the city's reliance on agriculture, the problem has resulted in both economic stagnation and outdated infrastructure. The Yavatmal offers a distinct set of opportunities and challenges, mostly due to its socioeconomic and geographical characteristics. Being the rapidly growing city, Yavatmal faces critical issues including infrastructural shortages, environmental deterioration, and a slowdown in its socio-economic development that make it suitable for the cause of development-centered urban regeneration. This inclusive planning may help in balancing the city's economic expansion.

5.0 Results

Through literature analysis, five major themes are urban regeneration, community resilience, socio-economic regeneration, environmental sustainability, and smart infrastructure. have emerged to determine the challenges with infrastructure physicality, economic decline, social problems, smart infrastructure and green space opportunities. While issues with physical infrastructure include outdated utilities and a lack of connectivity, economic decline is characterized by decreased industrial activity and unemployment. The problems urban regions confront are made worse by social concerns such as inequality and housing conditions. Growing green areas, promoting sustainability, and incorporating smart technology present opportunities.

The integration of sustainable practices within urban regeneration is crucial for enhancing the quality of life and fostering economic growth (Neves, 2024). The literature emphasizes the importance of participatory processes and stakeholder involvement in achieving successful regeneration outcomes (Chahardowli, 2020). The involvement of local communities in the planning process fosters a sense of ownership and responsibility, which is essential for the sustainability of regeneration efforts (Neves, 2024). Additionally, the implementation of renewable energy sources and energy-efficient systems in urban regeneration projects can significantly reduce the carbon footprint of urban areas (Cahantimur, 2023). The regeneration of historic city cores has been identified as a key strategy for enhancing urban identity and attracting investment (Chahardowli, 2020).

The study identifies the main urban problems in Yavatmal with regard to environmental deterioration, economic decline, and a lack of infrastructure. The study uses a Multi-Criteria Decision-Making (MCDM) approach to prioritize urban regeneration initiatives based on stakeholder input, economic viability, and sustainability. Unused land, infrastructural gaps, and

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redevelopment zones may all be spatially mapped with the use of geographic information systems (GIS). The findings indicate that high-density regions with underutilized transportation hubs, ecologically sensitive areas, and insufficient basic amenities are locations with potential for urban regeneration. According to the study, parks and green areas, intelligent infrastructure, affordable housing, and cultural preservation are important tactics for inclusive urban growth. The MCDM framework prioritizes regeneration by taking into account a number of factors, including economic possibilities, environmental considerations, and human well-being. GIS-based thematic mapping makes it easier to identify the locations where interventions should be concentrated, which is accomplished through resource-optimal urban planning.

6.0 Discussion

The findings are in the direction of data-driven decision-making in urban redevelopment, particularly for medium-sized communities like Yavatmal, where infrastructure development has been delayed by economic dependence on agriculture. The study follows global best practices for urban revitalization by identifying targeted intervention zones using GIS-based spatial analysis. One important takeaway is that community-led and sustainable revitalization initiatives require stakeholder involvement. Global experience shows that sustainable land-use planning regulations, economic diversity, and collaborative governance are the keys to urban revitalization. The study supports resilient, inclusive urbanization, which is one of the Sustainable Development Goals (SDGs 11 and 8). Despite the unique socioeconomic and infrastructure issues in Yavatmal, other communities dealing with urban deterioration can use the MCDM-GIS hybrid model as a model. Long-term growth of sustainable urban ecosystems may be achieved by the integration of economic hubs, ecological protection, and smart infrastructure.

7.0 Conclusion

This study emphasizes the value of integrated urban regeneration strategies in the revitalization of metropolitan areas affected by environmental and socioeconomic problems. The study offers a methodical way to find, assess, and implement regeneration initiatives in Yavatmal by using MCDM for ranking and GIS for geographical analysis. The proposed approach promotes long-term economic sustainability and social engagement in addition to addressing immediate infrastructure deficiencies. Research suggests that urban resilience may be enhanced by a phased implementation strategy that incorporates green spaces, smart infrastructure, and economic diversity. In order to evaluate the long-term efficacy of municipal regeneration initiatives, future study would incorporate longitudinal impact studies. Furthermore, in order to ensure that city regeneration is always responsive to evolving municipal needs, policy guidelines must include citizen involvement and adaptive planning. In

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order to create a sustainable and just future, communities like Yavatmal may transform unused assets into vibrant urban areas by using a deliberate, evidence-based, and participative strategy.

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