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Article in *International Review for Spatial Planning and Sustainable Development* · April 2024

DOI: 10.14246/irspsd.12.2_28

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Exploring the Application of Ecosystems Approach to Urban Planning: *A Systematic Literature Review*

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Received: Aug 8, 2023 ; Revised: Nov 17, 2023 ; Accepted: Jan 15, 2024

Keywords: Bibliometric analysis, Biodiversity, Ecosystems approach, Ecosystem services, Socio-ecological systems, Systematic literature review

Abstract: The current patterns of urbanization across the globe are characterized by rapid growth and development scenarios, often resulting in deteriorated urban environments. With the growing urban population, the pressure on infrastructure and services is elevated, resulting in stress on natural systems and poor health and well-being of citizens. In response to these challenges, the researchers are exploring approaches for urban planning leading to sustainable urban futures. The ecosystem's approach to urban planning was once such a concept, creating cities with high-quality urban life by managing the dynamics between social, economic, and environmental systems. Thus, a systematic literature review of 105 research papers using the PRISMA methodology to identify the most pertinent themes for applying the ecosystems approach in urban planning is conducted. In addition, a bibliometric analysis from 2007 to 2021 is performed using a VOS viewer to analyse the literature trends graphically. The articles were identified from the Scopus database, and the annual research publications trends, contributing countries, and the collaboration of keywords were retrieved. The review identifies three key themes: ecosystem services, socio-ecological systems, and biodiversity, forming the basis for applying the ecosystems approach in urban planning to strengthen sustainable city development.

1. INTRODUCTION

Urbanization has resulted in unprecedented changes in global ecosystems, altering human settlements worldwide and tremendously straining our natural resources. Currently, more than half of the global population lives in cities, and by 2050, this count will rise to two-thirds of the world's population residing in urban regions ([De La Fuente, Bertzky et al., 2020](#)). This trend has been particularly noteworthy in developing countries like India, where people have rapidly moved from rural to urban locations ([Bettin and Wollni, 2020](#)). This rapid urbanization has resulted in a range of complex challenges, such as environmental degradation, resource depletion, social inequality, and economic instability, which are interconnected and exacerbate each other, thus impacting cities worldwide. These pressing issues significantly impact urban environments today, visible to us as fragmentation of natural ecosystems, increased air-water pollution, rising respiratory concerns, and declining



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mental health and well-being of urban residents. Various human activities significantly impact local environmental conditions, and deterioration at the regional scale in many cities affects the global environment together ([Yang, Yu et al., 2023](#)). Rising urban population, widespread urban sprawl, increased transportation, and booming industries contribute to the depletion of the quality of natural resources. This further leads to climate change scenarios, which occur massively due to significant greenhouse gas emissions in cities ([Wu, Wang et al., 2021](#)). The arrangement of cities with more impervious surfaces and less greenery also causes urban heat islands, intensifying heat waves that harm the general public's health. Cities significantly impact the natural environment, jeopardizing biodiversity and ecosystems through land-use modifications, altered natural hydrology patterns, energy movement, nutrient recycling, degraded ecosystems, and introducing non-native species ([Wu, Wang et al., 2021](#); [Zhang and Ma, 2021](#); [Zhu, Chen et al., 2021](#)).

In response to these challenges, many urban planners and policymakers are exploring approaches to urban development to support more sustainable and resilient urban futures. The ecosystems approach to urban planning is one such concept, creating cities with high quality of urban life by managing the dynamics between social, cultural, economic, ecological, environmental, political, and institutional parameters ([Richter, Xu et al., 2015](#); [Tolstykh, Gamidullaeva et al., 2020](#)). It aims to strengthen local, regional, and global ecosystems through a harmonious city development pattern. Being a key component of sustainable urban development, it recognizes the importance of integrating ecological principles into urban planning and design. It has emerged as a promising solution to mitigate the negative impacts of urbanization on natural systems. The ecosystem approach to urban planning is based on the concept that urban environments are complex ecosystems providing services that benefit both humans and the natural environment ([De Lucia, 2018](#); [Richter, Xu et al., 2015](#)). These services include regulating, supporting, and cultural services essential for human well-being, such as air and water purification, climate regulation, pollination, and recreation. Urban planners and policymakers can use the ecosystem approach to urban planning to ensure that the natural environment is considered in all aspects of urban planning, from the location of buildings and infrastructure to the provision of green spaces and the management of urban waste ([Sangwan, Kumar et al., 2023](#)). In recent years, the quest to create sustainable cities has led to researchers' high interest in applying the ecosystems approach in urban planning. This systematic literature review thus attempts to identify critical concepts for utilizing the ecosystems approach in the city planning process. Bibliometric analysis is also performed on the reviewed articles to determine the current associated trends, guiding the policymakers to make effective choices while making city decisions.

2. METHODS

This study aims to review the current literature on the topic 'Ecosystems approach to Urban planning' with a significant focus on understanding the ecosystems approach and identifying the key ideas and concepts associated with the application of the ecosystem approach in the urban planning process. To do so, the study undertakes a systematic literature review, and this section describes the detailed methodology followed to conduct this study. A systematic literature review is a scientific method for identifying, evaluating, and synthesizing existing literature to address specific research questions

([Mengist, Soromessa et al., 2020](#)). The review process uses particular inclusion and exclusion criteria, allowing only the relevant studies to be included. This literature review aims to provide a transparent and unbiased summary of the ecosystems approach to urban planning by identifying ranging articles and their trends. Through this evidence-based information, decision-makers can make informed choices for urban policy formation. In this study, a systematic literature review is preferred over narrative, scoping, or rapid literature reviews as it proves to be of much higher quality ([Owen, 2020](#)). Also, the study identifies gaps for advancing knowledge in the ecosystems approach by expanding the scope of further investigation. In order to make the systematic literature review process efficient, a framework proposed by ([Mengist, Soromessa et al., 2020](#)) was utilized, as many of the previous studies have relied on this framework and have advocated it for the transparency and efficiency of the findings ([Blanco-Zaitegi, Etxeberria et al., 2022](#); [Kannan, Shankar et al., 2022](#)). The systematic literature review in this paper follows the following steps: identification of research questions, classifying relevant studies, literature search, bibliometric analysis, results and discussions, and conclusion.

2.1 Identification of research questions

Systematic literature reviews work better when research questions guide them, and for this purpose, the research questions for this Systematic literature review are as follows:

What is the primary understanding of the ecosystem approach in the urban planning context within the identified studies conducted across the literature?

What are key concepts associated with application of ecosystems approach in the urban planning process, as the literature supports?

2.2 Classifying relevant studies

Systematic literature reviews can be based on various sources like online databases, organizational publications, previous research references, and hand-searching articles for grey areas. In order to identify the relevant studies, this review preferred the Scopus database to find appropriate peer-reviewed literature. Books, thesis, and various grey literature were excluded from the results, and only Scopus-indexed peer-reviewed journal articles were included. This allowed methodological filtering of a large number of resultant articles. Additionally, attention was given to selecting research papers with ranging concepts and theories to answer the research questions effectively. Further, based on the research questions, the Scopus database was scanned, and the resultant articles related to the ecosystems approach to urban planning were utilized to derive keywords and their associated terms, as shown in *Table 1* below. Based on the keywords and its associated terms, a search string as follows was formulated:

(Ecosystems approach OR Ecosystems OR ecosystems services OR ecology OR urban ecology) AND (Urban OR Planning OR Urban development OR urban planning)

Table 1. Keywords and its associated terms

Keywords	Associated Terms
Ecosystems approach	Ecosystems, ecosystems services, ecology, urban ecology, biodiversity, nature, conservation, wildlife, landscape ecology
Systems	Systems thinking, systems approach, system dynamics, flows, metabolism, transdisciplinary, non-linear, resilience, integration
Urban Planning	Built environment, green space, landscape
	Urban development, urban planning, landscape planning, sustainable development
Sustainability	Sustainab*, sustainability assessment, sustainability indicators, sustainable development

2.3 Literature search

After developing, the search string was tested in the SCOPUS database (see Figure 1 below). The total of 802 articles that appeared were then exported into Mendeley. Amongst these, 709 articles were kept, and other duplicates were filtered out. Further, 312 relevant articles were selected based on the combination of search string terms and were then exported to MS Excel. The article's titles, abstracts, authors' names, and year of publication were recorded in the Excel spreadsheet.. Titles and abstracts of these articles were studied, and only 208 were found to be relevant to our review. Amongst these, 103 were excluded as they were found to be from the grey literature. Finally, only 105 articles were included in the systematic literature review, and their findings are discussed further.

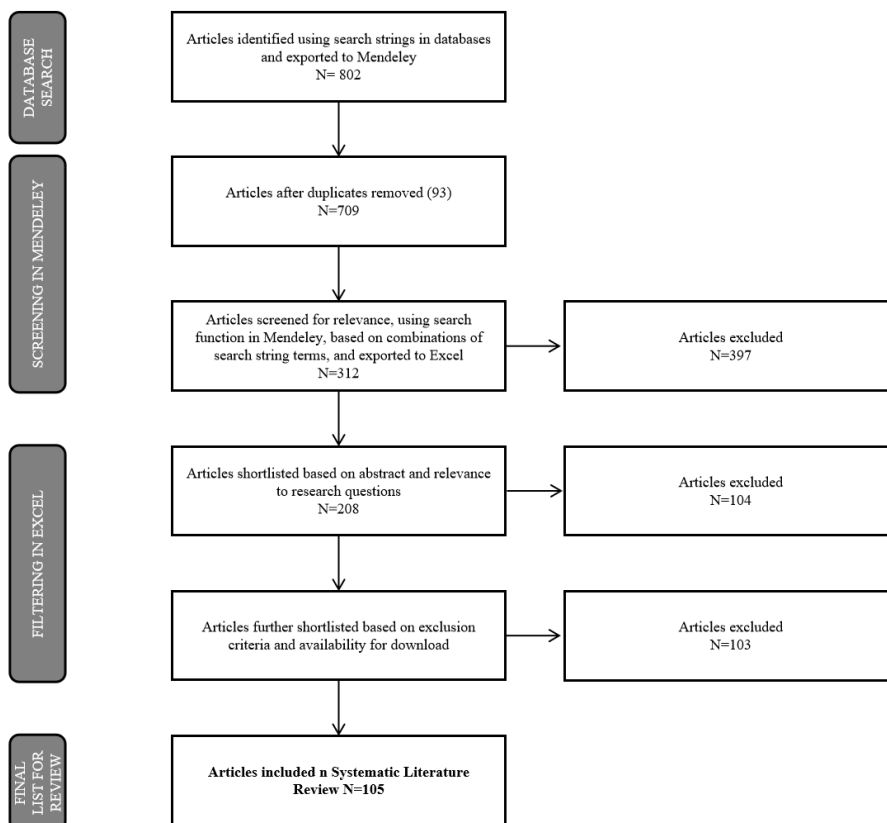


Figure 1. Process of selecting articles for the Systematic Literature Review from 2007 to 2021 following an initial literature search (based on the PRISMA flow diagram)

2.4 Bibliometric analysis

Bibliometric analysis was performed 105 research papers to view the overall scenario and trends associated with publications, countries, and keywords.. This allows the identification of relevant common themes and concepts within the literature ([Linnenluecke, Marrone et al., 2020](#)). It represents the data in a listed, tabulated, or graphical form showing the publication year, authors, and country of origin along with the briefing of the study ([Oh and Lee, 2020](#)).

2.4.1 Publication trends

The research papers reviewed were written in the last sixteen years, from 2007 to 2021, with the majority written in the last four years (70%). This provides evidence that the integration of ecosystems approach in urban planning is a relatively new and expanding field of research. *Figure 2* below demonstrates the publication trends of the research papers on the Ecosystems approach to urban planning from 2007 to 2021. It shows that ecosystems approach to urban planning have been emerging as a relevant study in urban planning with increasing focus being given on the subject over the years.

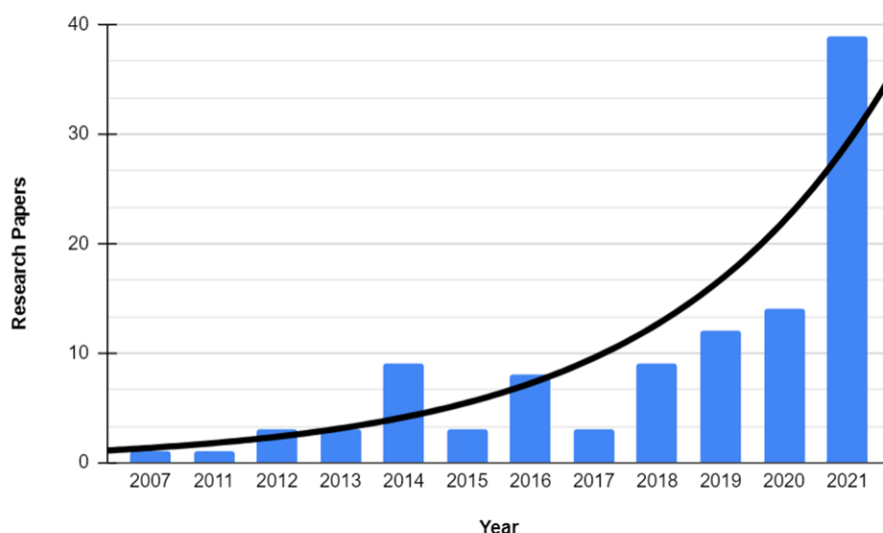


Figure 2. Publication trends of research papers selected for Systematic Literature Review from 2007 to 2021

2.4.2 Countries trends

The majority of research papers (35%) were written by academics located in either China (20), India (6), Germany (4), Italy (4) or Barcelona (3). Most researchers in this field today are Chinese academicians who approach their work with a distinctive worldview. A new perspective on the ecosystems approach to urban planning can be acquired by tapping into Chinese traditions of thought owing to the contribution of Chinese academics. Table 3 includes a complete list of country-specific numbers of peer-reviewed research papers published.

Table 2. Country specific number of peer-reviewed research papers in the Systematic Literature Review from 2007 to 2021.

Country	Research Papers
China	20
India	6
Germany	4
Italy	4
Barcelona	3
Finland	2
Spain	2
Sweden	2
Iran	2
Latin America	2
USA	2
Singapore	2
Switzerland	1
Minneapolis	1
Malta	1
Brazil	1
Europe	1
Netherlands	1
UK	1
Ethiopia	1
Mexico	1
Canada	1
Vanuatu	1
Turkey	1
Portugal	1
Chicago	1
Hungary	1
Ontario	1
Dongguan	1
New York	1
Oregon	1
Stockholm	1
Madagascar	1
Bogotá	1
Australia	1
Stockholm	1
TOTAL	105

2.4.3 Keywords correlation

A keyword co-occurrence analysis was performed for the identified studies in VOS Viewer, a software tool to build and visualize the bibliometric networks and clusters for identifying relevant themes ([Lozano, Calzada-Infante et al., 2019](#)). Figure 3 shows that ‘ecosystem services’ is an essential keyword in the literature (40 occurrences), thus releasing that ‘ecosystem services’ is the most valuable concept to incorporate in urban planning. Further urban planning (15 occurrences), urban ecology (10 occurrences), and urbanization (10 occurrences) are the most recurring keywords, establishing the rising importance of the ecosystems approach within the city planning process. Also, green infrastructure (7 occurrences) and biodiversity (7 occurrences) keywords appear as common themes to be valued in urban development. Looking at the time scale of the occurrences, it can be observed that several new concepts (demonstrated in yellow-coloured keywords) ignited from around 2018 associated with the application of the ecosystems approach to urban planning. These are nature-based solutions, land use planning integration, ecosystem management, blue-green infrastructure, and ecological integrity.

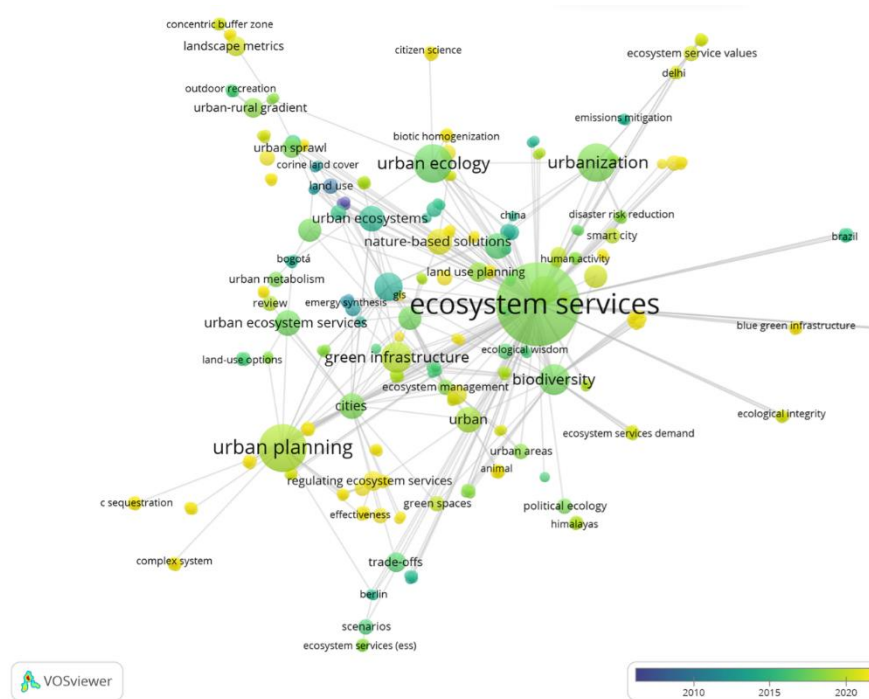


Figure 3. Network showing collaboration of keywords Systematic Literature Review from 2007 to 2021.

In the further sections, the findings of the research questions are summarized and reported through an extensive and critical understanding of the identified literature.

3. RESULTS & DISCUSSIONS

This section analyses and discusses the significant findings of the systematic literature review aimed at answering the research questions framed at the beginning of the study. The following subsection answers the first research question, i.e., What is the primary understanding of ecosystem approach in urban planning context within the identified studies conducted across the literature? The subsection begins by discussing the ecosystem's approach, its evolution, and its status across global and Indian cities.

3.1 Ecosystems approach

The intentions of developing sustainable urban futures have been prolonged amongst architects, urban planners, historians, and researchers, manifested through various conceptual efforts ([Jansson, 2013](#)). The ecosystems approach is one such concept. It is a holistic and interdisciplinary approach to managing natural resources and biodiversity ([Ernstson and Sörlin, 2013](#)). It recognizes that ecosystems are complex and interconnected systems involving interactions between living organisms and their physical environment. In addition to considering the needs and interests of all stakeholders involved in the management of the ecosystem, it consists of the integration of scientific, economic, social, and cultural aspects in the direction of natural resources ([Chen, Chen et al., 2014](#)). The significance of comprehending ecosystem linkages and interdependencies and the effects of human activity on these systems is emphasized. The ecosystem approach aims to promote the sustainable use and conservation of natural resources and to

ensure the long-term viability of ecosystems and their services ([Cortinovis and Geneletti, 2018](#)). Managing natural resources, including forests, wetlands, marine ecosystems, and agricultural landscapes, extensively uses this technique.

Elaborating on the same, the ecosystems approach to urban planning recognizes that cities are complex, interconnected systems wherein the changes in one part of the system significantly impact other functions. It considers the interactions between natural and built environments, human communities, and the economy, as well as seeks to balance the needs of society with the protection and enhancement of natural resources and ecological systems. Urban areas are the primary drivers of environmental degradation, resource consumption, and greenhouse gas emissions ([Wang, Jiang et al., 2021](#)). Thus, the preservation of natural areas existing in and around urban areas, such as parks, wetlands, forests, and green corridors, becomes highly crucial as they are the providers of essential services like air and water purification, flood control, and biodiversity conservation ([Guillen-Cruz, Rodríguez-Sánchez et al., 2021](#)). Also, urban areas are not isolated from their surroundings but are interconnected with surrounding natural ecosystems; therefore, the ecosystem approach emphasizes the need for integrated urban planning by utilizing relevant knowledge of disciplines such as environmental science, social science, and engineering to promote sustainable city. More liveable cities with better quality of life for urban citizens can be achieved through the incorporation of an ecosystems approach, as it recognizes that human well-being is intertwined with the health of the environment and that by protecting and enhancing natural resources and ecological systems, a better future for the planet can be created. Moreover, the ecosystems approach to urban planning recognizes that social and economic systems are also interconnected with the environment.

Applying the ecosystems approach within the urban planning offers numerous benefits for our cities ([Gao, J., Yu et al., 2019](#)). It promotes the conservation and enhancement of urban biodiversity by preserving and creating green spaces that provide wildlife habitat and support ecological processes ([Basnou, Baró et al., 2020](#)). Integrating green infrastructure into metropolitan areas, such as parks, green roofs, and tree-lined streets, improves air and water quality, reduces heat island effects, and promotes physical activity, positively impacting public health. These green spaces also provide economic benefits, increased property values, and reduced energy costs ([Nigussie, Liu et al., 2021](#)). By supporting local businesses and creating jobs in sectors such as green infrastructure development and ecotourism, the ecosystems approach also recognizes that healthy ecosystems are essential for economic growth. Thus, the ecosystems approach creates sustainable and resilient cities by balancing the needs of society with the protection and enhancement of natural resources and ecological systems. Social equity amongst urban residents can also be enhanced by providing them equal access to green spaces and ecosystem services, regardless of income or social status ([Di Marino, Tiitu et al., 2019](#)). By prioritizing social equity and justice, it addresses historical inequities in urban planning and ensures that all members of the community benefit from sustainable urban development. Thus, it prioritizes access to nature in urban policy-making. Furthermore, this approach emphasizes the importance of participatory planning and the inclusion of diverse stakeholders in the decision-making process ([Nigussie, Liu et al., 2021](#); [Sharma, B., Sharma et al., 2022](#)). It also recognizes that urban areas are vulnerable to a range of environmental and social challenges and thus builds resilient urban systems that can adapt to changing conditions and

increase urban areas' long-term viability and sustainability. Also, it helps cities adapt to environmental changes and natural disasters and reduce their environmental impact. Further, the ecosystems approach also achieves the mitigation and adaptation to climate change as it helps reduce greenhouse gas emissions and enhances resilience to extreme weather events, such as floods and heat waves ([Dhyani, Lahoti et al., 2018](#)). It recognizes that climate change will significantly impact urban systems and seeks to reduce their vulnerability to these impacts. Thus, incorporating the ecosystems approach into urban planning is essential for fostering sustainable growth in our cities.

3.2 Recognizing and evaluating the key concepts and themes

The following subsection answers the second research question, i.e., What are key concepts associated with applying the ecosystems approach in the urban planning process as supported in the literature? The subsection thus identifies and discusses the key concepts to be remembered while applying the ecosystems approach to the urban planning process. These concepts are ecosystem services, socio-ecological systems, and biodiversity.

3.2.1 Ecosystem services

Ecosystem services encompass providing food, water, fiber, and fuel and regulating climate, air and water quality, and illness ([Francini, Hui et al., 2021](#)). The cultural benefits of ecosystem services include aesthetic and recreational values, and spiritual and educational benefits. The ecosystem services paradigm has evolved, both in terms of scientific comprehension and policy application. Early environmentalists such as John Muir and Aldo Leopold, who advocated for preserving natural places for their inherent beauty and biological purpose, can be credited with the view that 'nature has value beyond its instrumental use for humans' ([Goralnik and Nelson, 2011](#); [Lee, 1982](#)). Early in the 20th century, ecologists began exploring the interactions between species and their habitats, resulting in a more excellent knowledge of ecosystems' role in sustaining life. In the 1980s, conservation biologists began investigating the effects of human activities on biodiversity and the functioning of ecosystems, resulting in a deeper awareness of the importance of ecosystem services. The term "sustainable development" first appeared in the 1980s and 1990s to balance social and environmental concerns with economic growth. This resulted in more people paying attention to how ecosystems sustain human well-being. After the Millennium Ecosystem Assessment was published in the early 2000s, the idea of ecosystem services became generally accepted by policymakers ([van Oorschot, Sprecher et al., 2021](#)). The state of the world's ecosystems and their benefits to human well-being were thoroughly evaluated in this report. With an emphasis on encouraging the sustainable provision of ecosystem services through strategies like ecosystem-based management and payments for ecosystem services, the notion of ecosystem services has recently become more broadly integrated into natural resource management and policy ([Lak, Sharifi et al., 2021](#)). The term "ecosystem services" refers to several key ideas. Natural resources and ecosystems that provide ecosystem services, such as forests, wetlands, and coral reefs, are natural capital ([Escobedo, Giannico et al., 2019](#)). The acts and interactions inside ecosystems, such as nutrient cycling, pollination, and decomposition, are called ecosystem functions. High levels

of functional diversity and biodiversity in an ecosystem make it more resistant to environmental change and better equipped to deliver various ecosystem services. Adaptive management aims to support the sustainable provision of ecosystem services ([Menconi, Palazzoni et al., 2021](#)). It entails monitoring management practices and making adjustments as necessary in response to shifting environmental factors. Ecosystem services can be made more visible and used as a benchmark for managing natural resources by being given a monetary value ([Gao, P., Li et al., 2021](#)). Quantifying many ecosystem services is complex, and putting a price on something might turn nature into a commodity. These difficulties make it challenging to value ecosystem services. These ideas are crucial for comprehending and administering ecosystem services integrated and sustainably.

3.2.2 Socio- ecological systems

Socio-ecological systems (SES) represent natural and social elements as well as the interaction between them. These interactions are dynamic in nature and are thus complex. Conceptualizing cities as SES allows understanding of human-environment interactions with consideration of social and cultural factors in addition to ecological factors when making decisions about resource management, conservation, and urban development ([Ramyar, 2019](#)). This allows the application of integrated approaches for environmental management and urban policy foundation. The concept of socio-ecological systems emerged as a distinct concept in the late 20th century. It was developed by ecologists and then propagated by social scientists. In the 1970s and 1980s, ecologists began to recognize the importance of understanding the relationships between humans and the natural environment. In the 1990s, the concept of SES became more widely recognized and was used in interdisciplinary research and policy discussions. Later the understanding of SES continued to evolve and became a central concept in sustainability science, conservation biology, and environmental management ([Pan, Zhang et al., 2021](#)). The ideology of SES allows for understanding the complex and dynamic relationships between people and the environment, and also developing policies and strategies promoting sustainable development and environmental stewardship ([Patten, 2016](#)).

SES have the ability to absorb shocks and disturbances while maintaining their structure and function over time because of their adaptive capacity, learning, and diversity in building resilience. They emphasize the need to consider social justice, equity, and the voices of marginalized communities in urban environments decision-making. At the same time, SES also focuses upon the benefits that people derive from ecosystems, such as clean water, air, and food, and also the need to manage ecosystems in a way that maintains these services. The nature of SES is interdisciplinary thus while shaping urban planning policies as well as managing resources, the decision makers get inputs from a wide range of fields such as ecology, biology, sociology, economics, and political science. SES have the quality to adjust itself in response to changes occurring in the environment through their many individual components that interact in dynamic non- linear patterns over multiple scales.

3.2.3 Biodiversity

Biodiversity is simply the diversity of 'bio' or living organisms on Earth. These living organisms could be animals or plants. Humans receive a range of

ecosystem services from these living beings, which elevates the urban environmental quality. Biodiversity is the soul of a system, maintaining the air and water levels, improving soil fertility and, overall climate regulation. ([Basnou, Baró et al., 2020](#)) describes in his study the realization of the interdependence between humans and the natural world. He says that the diversity of species and ecosystems in an urban landscape describes the status of its dwellers' health. Discussions on the concept of biodiversity began in the 1980s as scientists started to realize the role of species diversity in ecological well-being. These efforts were further accentuated by the Convention on Biological Diversity, which established a framework for biodiversity conservation and sustainable use ([Leal Filho, Barbir et al., 2020](#)). Considering biodiversity in urban planning involves incorporating ecological design principles and sustainability into urban development ([Beller, McClenachan et al., 2020](#)). Cities are not isolated from their surrounding ecosystems, and preserving flora and fauna species maintains a healthy and resilient urban environment. Creating wildlife corridors between green spaces and natural areas allows species migration and leads to their genetic diversity. Also, restoring the native plant species provides habitat for local wildlife, along with improving the overall ecological health of the area ([Threlfall and Kendal, 2018](#)). Practices such as urban agriculture restore pollinators and wildlife habitats, improve food security, and reduce the environmental impact of urban emissions from transportation and industries.

4. CONCLUSION

The unprecedented urbanization scenarios expose urban areas to several environmental challenges. In developed countries like the United States, many forests have been destroyed due to the growth of metropolitan regions ([Kaza, 2013](#)). The loss of forest cover, wetlands, and other open spaces soared as high as 2,11,062 acres in Washington DC. Nearly 5,000 acres of wetlands are lost in California every year. In Europe, an increase in households is anticipated to result in 12.5 million new homes being constructed ([Antrop, 2004; Kasanko, Barredo et al., 2006](#)). Many other developed countries with high urbanization are experiencing a rise in pollutants, acidity, water quality degradation, hydrological changes, and higher water temperatures in lakes, ponds, and streams. Urban growth and road construction have also depleted many productive assets recently. Developing countries are also becoming increasingly prone to these environmental challenges; for instance, in Bangkok, where transportation accounts for 70% of urban energy consumption, 4000 to 5500 premature deaths per year are directly related to short-term exposures to outdoor airborne particulate matter ([Srichuae, Nitivattananon et al., 2016](#)). Sewage, sanitation, industrial water and air pollution, greenhouse gas emissions, and concerns about green spaces are some of the significant environmental issues that Asia is currently dealing with. These issues result in heavy traffic and air pollution, underdeveloped water supply and sanitation systems, and inadequate services for a sizable portion of the urban population. In India, the cities are growing in size, population, and density. Additionally, in the top 100 cities, the built-up area has increased 2.5 times in the last 20 years ([Ahluwalia, Kanbur et al., 2014](#)). The three Indian cities of Delhi, Mumbai, and Kolkata, along with three of the ten fastest expanding cities in the world—Ghaziabad, Surat, and Faridabad—are among the ten largest cities in the world. Thus, they put much pressure on the environment. Urban growth in India is typically nucleated, with new

urbanized land clustering around the older parts of the city in a tight band. In contrast, land scarcity in high-growth cities like Bangalore and Pune causes the city to spread outward, which increases fragmentation at the periphery. In contrast, in Lucknow, a smaller city, growth is primarily concentrated in the city core due to infilling, producing more noticeable effects.

Rapid urbanization is a quintessential part of the current growth patterns. However, its adverse outcomes in terms of deteriorated natural environment and loss of biodiversity have rampant effects on global populations for both developed and developing countries and their cities. The quest of researchers to look for concepts yielding sustainable city outcomes has led to the evolution of the ecosystems approach. However, it has to find its widespread prominence in the urban planning process, and thus, the degradation of local, regional, and global environments continues. The current urban planning practices focus primarily on providing infrastructure and services for urban dwellers, and the natural systems are barely given attention ([Sharma, S., Saini et al., 2023, 2024](#)). Thus, the systematic literature review propagates the application of the ecosystems approach in the urban planning process, yielding amicable human and natural systems relationships by conceptualizing cities as dynamic socio-ecological systems.

The current systematic literature review identifies three key themes: ecosystem services, socio-ecological systems, and biodiversity, forming the basis for applying the ecosystems approach in urban planning to strengthen sustainable city development. The critical understanding of these key themes paves the way for protecting and enhancing natural systems through integrated urban planning, emphasizing enhancing cities' ecosystem services, considering socio-ecological systems and biodiversity conservation, and yielding sustainable cities with high-quality life for urban citizens. Literature on the ecosystem approach to urban planning is still growing, and further reviews could identify elaborated themes for its application. Future research should be more oriented toward developing urban planning policies to strengthen the sustainable development of cities. Also, collaboration with multiple disciplines must be prioritized in urban planning.

AUTHOR CONTRIBUTIONS

Conceptualization, Anjali Saraswat and Dr Satish Pipralia; methodology, Anjali Saraswat and Dr Ashwani Kumar; software, Anjali Saraswat; investigation, Anjali Saraswat; resources, Dr Satish Pipralia and Dr Ashwani Kumar; data curation, Anjali Saraswat; writing—original draft preparation, Anjali Saraswat; writing—review and editing, Anjali Saraswat and Dr Ashwani Kumar; supervision, Dr Ashwani Kumar and Dr Satish Pipralia. All authors have read and agreed to the published version of the manuscript.

ETHICS DECLARATION

The authors declare that they have no conflicts of interest regarding the publication of the paper.

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