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Research Paper

Exploring Urban Liveability: Frameworks and Approaches for Sustainable Cities

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Abstract:
Urban liveability, a pivotal concept in contemporary urban studies, prioritizes the well-being and satisfaction of city residents. This paper conducts a comprehensive examination of urban liveability, delving into its multifaceted dimensions and indicators through a systematic literature review across disciplines such as urban studies, geography, sociology, and environmental science. It synthesizes existing research to offer insights for policymakers, urban planners, and researchers. Encompassing factors like residential status, environmental aspects, inequality, transport, mobility, aging, and assessments using remote sensing and GIS-based techniques, understanding and evaluating these dimensions are vital for fostering sustainable, inclusive, and vibrant urban environments. Despite challenges in measurement and assessment due to cities' heterogeneous nature and residents' diverse perspectives, the paper emphasizes the need for integrated approaches and cross-sector collaboration to address urbanization challenges effectively. Through empirical support and critical analysis, it provides a holistic framework for urban planning and policy-making efforts, aligning with global sustainability goals like the Sustainable Development Goals and the New Urban Agenda. This paper underscores the significance of considering diverse factors and perspectives in shaping urban liveability, serving as a valuable resource for stakeholders committed to creating resilient, vibrant, and equitable cities that enhance residents' overall quality of life.

Keywords*: Liveability, Residential status, Environmental aspects, Inequality, Transport*

I. Introduction

Urban liveability has emerged as a critical concept in contemporary urban studies, focusing on the creation of cities that prioritize the well-being and satisfaction of their residents. It encompasses a diverse array of factors ranging from environmental sustainability to social inclusion and economic prosperity (Sheikh, et al., 2022). As cities continue to grow and evolve, understanding and enhancing urban liveability becomes increasingly pertinent for policymakers, urban planners, and researchers alike (Allam, 2020). The concept of urban liveability underscores the complex interplay between the built environment and the human experience, encompassing both physical and socio-economic dimensions (Skalicky & Čerpes 2019). It involves assessing how effectively cities meet the diverse needs and aspirations of their inhabitants, considering factors such as access to green spaces, transportation infrastructure, social amenities, and economic opportunities (Badland et al., 2014). In recent years, there has been a growing recognition of the importance of creating sustainable, inclusive, and vibrant urban environments (Barton & Tsourou, 2013). International frameworks like the Sustainable Development Goals (SDGs) and the New Urban Agenda highlight the significance of urban liveability in achieving broader global sustainability objectives (Medeiros & van der Zwet,2020). However, measuring and evaluating urban liveability pose significant challenges due to the heterogeneous nature of cities and the diverse perspectives of their residents (Leh et al., 2020). While there are various approaches to assessing liveability, ranging from comprehensive evaluations to subjective assessments based on residents' perceptions, achieving standardized assessment across cities remains elusive (Khorrami et al., 2021). Despite these challenges, understanding the multidimensional nature of urban liveability is essential for guiding urban planning and policy-making efforts (Australia, 2018). By integrating environmental, social, economic, and cultural considerations, stakeholders can work towards creating healthier, more sustainable, and inclusive urban environments (Biswas, 2022).

II. Methodology

The methodology employed in this review paper on dimensions of liveability involves a comprehensive literature review and synthesis of existing research across multiple disciplines such as urban studies, geography, sociology, and environmental science. A systematic search strategy was implemented to identify relevant studies, including academic journals, conference proceedings, books, and reports, using databases such as PubMed, Google Scholar, Web of Science, and Scopus. Keywords related to each dimension of liveability were utilized to ensure thorough coverage of the topic. The selected literature was critically analyzed to identify key themes, trends, and gaps in understanding. Additionally, qualitative and quantitative data were extracted from relevant studies to provide empirical support and insights into the various dimensions of liveability. Special attention was given to identifying methodologies used in studies focusing on remote sensing and GIS-based assessment and analysis of liveability indicators. Overall, this methodology aims to provide a comprehensive overview of the concept of liveability and its dimensions while integrating diverse perspectives and empirical evidence from the literature.

Dimensions of Liveability

Urban liveability, a multifaceted concept, encompasses various dimensions that contribute to the overall quality of life in cities (Newman & Kenworthy, 1999). These dimensions often include but are not limited to factors such as access to amenities, environmental quality, social cohesion, and economic opportunities (Beatley, 2016). Understanding and evaluating these dimensions are crucial for urban planners, policymakers, and researchers aiming to create more sustainable and enjoyable urban environments (Carmona, 2021). However, defining and measuring liveability can be complex due to its subjective nature and varying priorities across different communities and cultures (Souter-Brown, 2014). Therefore, researchers have developed numerous frameworks and approaches to conceptualize and assess liveability, each offering unique insights and methodologies (Fry, 2013).

Concept:

The concept of liveability revolves around creating living environments that prioritize residents' well-being and happiness, incorporating both environmental and human variables (Pandey et al., 2013). It involves assessing how effectively a city's built environment and services meet citizens' needs and aspirations, considering factors like convenience, amenity, health, safety, and balanced development (Gough, 2015; Hagerty et al., 2001). Urban planners strive to establish liveable cities with good inhabitable conditions, reasonable land use patterns, and support for residents' material and spiritual needs (Chen et al., 2016; Dumbaugh, 2005; Zhan et al., 2018). Liveable environments integrate physical and social well-being parameters to sustain a productive human existence and improve population health (Alderton et al., 2019; Giles-Corti et al., 2016; Freestone & Wheeler, 2015). Urbanisation underscores the importance of liveability in assessing city living standards, with the growth of urban populations expected to continue, potentially leading to socioeconomic prosperity and enhanced community well-being (Paul and Sen, 2020; World Bank Group, 2015). However, the concept of urban liveability is complex and heterogeneous, influenced by diverse perceptions and experiences of residents, making standardized assessment challenging across cities (Chiu, 2019). Nonetheless, improving liveability can promote residents' health and well-being while reducing a city's environmental impact, underscoring its importance in urban planning and design (Lowe et al., 2013; Alexander, 1977; Massengale and Dover, 2013). Urban liveability is inherently linked with urban form, which shapes and is shaped by urban life, making it a crucial consideration in addressing urbanisation challenges (Martino et al., 2021; Holanda 2013). Overall, the concept of liveability aims to meet residents' expectations for well-being and quality of life in urban spaces, encompassing diverse human needs and considerations (National Research Council, 2002; Martino et al., 2021).

Residential status

Urban residents are increasingly seeking a pleasant natural environment due to social and economic development. Key factors for liveable cities include climate, greenery, parks, water, and sociocultural amenities like social inclusion (Rehdanz & Maddison, 2008; Zhang et al., 2021; De Vos et al., 2016; Wang et al., 2020; Sirgy & Cornwell, 2002). Liveability encompasses physical-environmental and cultural dimensions, influenced by individual socioeconomic attributes such as gender, age, education, income, and home ownership (Campbell et al., 1976; Ren & Folmer, 2016; Mohit et al., 2010). However, the impact of these attributes on residential satisfaction varies (Chen et al., 2013; Mohit et al., 2010). Empirical studies show diverse findings based on specific places, groups, and timeframes (Mohit et al., 2010). Liveability is defined by the quality of urban environments meeting residents' needs and expectations (Balsas, 2004; Jomehpour, 2015). The concept of community plays a crucial role in urban liveability, with a strong sense of community significantly associated with residents' life satisfaction (Guzmán et al., 2019; Benita et al., 2020). Friendship, trust, social contacts, and participation in neighborhood activities contribute positively to happiness and overall well-being (Oshio 2017).

Moreover, mental well-being is closely tied to urban planning, as life satisfaction correlates strongly with self-reported mental health (Lombardo et al., 2018; Guney et al., 2010).

In urban development, harmony and liveability are paramount for residents' happiness and well-being (Zhang et al., 2016). The social environment, encompassing community structures and resources, significantly influences overall satisfaction (Salehi et al., 2017). Additionally, sociocultural factors like social inclusion and protection of historical culture contribute to a pleasant urban environment (Rostami et al., 2015). As urbanization increases, so does the importance of liveability, which encompasses various factors such as environmental sustainability, access to public amenities, and economic development (Pacione, 2003; Lovell et al., 2014; Xu et al., 2012). However, economically developed cities face challenges like high housing costs that can hinder liveability (Ogneva-Himmelberger et al., 2013). Research on liveability has expanded globally, with policymakers and practitioners increasingly focusing on urban sustainability (Kyttä et al., 2015; Ruth and Franklin, 2014). Despite differing perspectives between East and West, there's a shared emphasis on enhancing urban liveability (Andereck and Nyaupane 2011; Chen and Fazilov 2018).

Environmental Aspects

Cities must adapt to new threats, such as rising sea levels, while reducing future greenhouse gas emissions. Coordination from diverse sectors, including government, academia, the private sector, and civil society, is needed to create resilient, sustainable, inclusive, equitable, economically productive, and supportive cities (UN, D. 2018). Coordination among different sectors is emphasized for creating resilient, sustainable, inclusive, and economically productive cities (UN, 2018). City amenities, economic facilities, and residents' concerns about work availability are highlighted as crucial factors for measuring liveability. A multidisciplinary framework for assessing urban environmental quality and quality of life is proposed, addressing issues such as segregation, neighborhood degradation, and health disparities (Van Kamp et al., 2003). Geographical research into urban liveability focuses on assessing residents' satisfaction using both objective and subjective indicators and investigating contextual factors. The importance of environmental amenity in enhancing urban environments is discussed, encompassing factors like favorable climate, access to parks and water areas, green urban environments, and cleanliness (Rioux & Werner, 2011; De Vos et al., 2016; Węziak-Białowolska, 2016). Environmental pollution's negative impact on well-being is also highlighted (Saitluanga, 2013; Węziak-Białowolska, 2016). The physical environment, including factors like natural amenities and environmental health issues, influences perceived liveability and satisfaction with the urban environment. Economic prosperity is considered crucial for urban livability, but challenges such as high housing and living costs in economically developed cities are acknowledged (Ogneva-Himmelberger et al., 2013; Zhan et al., 2018). Overall, the text emphasizes the multidimensional nature of urban liveability and the importance of considering various factors, including environmental, economic, and social aspects, in urban planning and policy-making.

Inequality in Liveability

The text delves into the evolving concept of urban liveability, which has become closely linked to sustainability, focusing on environmental, economic, and equitable goals (Basiago, 1998). International agreements like the Sustainable Development Goals (SDGs) and the New Urban Agenda (NUA) aim to enhance urban quality of life, with SDG 11 targeting inclusive, safe, resilient, and sustainable cities (UN, 2018). In India, the Ministry of Urban Development has developed a city liveability index focusing on social, environmental, economic, and civic aspects influencing citizens' inclination to live in a city (CII, 2010). Additionally, liveability ranking metrics, such as those by the Economic Intelligence Unit (EIU), have emerged, using indicators like stability, healthcare, culture, education, and infrastructure to assess cities globally (Kashef, 2016). Various countries have different approaches to assessing liveability, with the UK prioritizing cleanliness, safety, greenery, and sustainability, while Australia focuses on residents' health, welfare, and quality of life (Leach et al., OCSE, 2015). Urban liveability measurement remains debated due to differing evaluation criteria and personal characteristics (Ruth & Franklin, 2014; Sofeska, 2017). In China, rapid urbanization has led to challenges like crime, air pollution, and inadequate public facilities, impacting urban liveability (Ouyang et al., 2017). Overall, urban liveability encompasses a broad spectrum of factors influencing a city's attractiveness and quality of life, including social amenity, health, wellbeing, livelihood, and ecological sustainability (Timmer & Seymoar, 2005; Newman, 1999).

Transport, Mobility and Liveability

The text emphasizes the importance of studying cities' genetic code to enhance their economic vibrancy by evaluating competitiveness and liveability (Antognelli & Vizzari, 2017). It suggests assessing cities based on dimensions and sustainability indicators, updating rankings every five years and linking development expenditure to liveability rankings (Giffinger et al., 2007; Faircloth 1998). Additionally, the quality of life (QOL) and wellbeing are closely linked concepts, with liveability reflecting the quality of life in human-

environment relations (Walljasper, 1997). Different criteria proposed for determining liveability vary at different stages of economic development (Ruth & Franklin, 2014). Liveability rankings focus on healthcare, cultural, environmental, educational, and infrastructural factors, highlighting the importance of green spaces in enhancing liveability and providing sustainable environmental services (Blomquist et al., 1988; Chabuk et al., 2017). The text also discusses the complexity of urban systems and geographic heterogeneity's impact on critical urban subsystems like transportation and energy, affecting liveability and environmental quality (Estévez-Mauriz et al., 2017). Spatial accessibility is identified as a crucial factor in urban liveability, contributing to vitality, walkability, and improved quality of life (Ducas 2011; Carlson et al. 2012; Frank et al. 2010). Furthermore, convenient transportation is highlighted as a significant predictor of people's satisfaction with the urban environment, particularly in densely populated areas like China, with factors such as road conditions, public transit access, parking availability, and traffic congestion influencing transportation-related satisfaction (Ji & Gao, 2010; Tao et al., 2014; Zhang & Gao, 2008; Saitluanga, 2013). Access to public transportation is shown to improve health and wellbeing outcomes (Eibich et al., 2016).

Aging and Liveability

The importance of selecting appropriate measurement methods for evaluating urban liveability from multiple dimensions and disciplinary angles (Pacione, 1990; Tang et al., 2017). It highlights factors such as urban security, environmental health, and the convenience of daily life as key influencers of urban liveability (Buys & Miller, 2012; Zhan et al., 2018). Urban security, encompassing traffic safety, crime rates, and emergency shelters, is crucial for shaping livable urban environments (De Jesus et al., 2010; Martínez et al., 2015; Yu & Wen, 2016). Environmental health, focusing on pollution in water, air, solid waste, and noise, is essential for constructing livable cities (Rehdanz & Maddison, 2008; Badland et al., 2014). Convenience of daily life, including access to public services like shopping, education, healthcare, culture, and entertainment, is another critical aspect of urban liveability (Mohit et al., 2010; Zhang et al., 2021). Economic prosperity is highlighted as crucial for material life and city construction, although often overlooked in livability evaluations, especially concerning high housing and living costs in economically developed cities (Ogneva-Himmelberger et al., 2013). Moreover, subjective satisfaction in a place is deemed crucial for identifying key attributes of livability, encompassing various domains like social, economic, physical, and psychological health, as well as access to amenities and safety (Shabanzadeh Namini et al., 2019; Yu et al., 2014). Urban liveability is defined as a well-balanced and stable development in economic, social, cultural, land use, and environmental aspects, closely tied to urban life (Liu et al., 2014; Kazemi et al., 2018). It emphasizes the importance of urban security, community resilience, and disaster management systems in shaping liveable urban spaces (Lombardo et al., 2018; Dirks, 2010). Recreation, leisure sports activities, and cultural services are also significant contributors to urban liveability, impacting residents' quality of life and satisfaction (Hartman et al., 2020; Wheatley and Bickerton, 2017).

Remote Sensing and GIS based Assessment and Analysis

The definition and assessment of urban liveability lack consensus, with various approaches highlighting different components and methods for evaluation. Existing methods for ranking cities based on liveability are often tailored to specific cities, limiting their transferability and failing to account for intra-urban differences (Van Kamp et al., 2003; Perez & Namazi, 2017). Three main approaches to urban liveability measurement include comprehensive evaluation, subjective assessment based on residents' perceptions, and the use of Geographic Information System (GIS) technology (Badland et al., 2014; Wang et al., 2020). Comprehensive evaluation involves measuring specific dimensions and objective indicators, while subjective assessment relies on surveys and interviews to capture residents' perceptions. The GIS method utilizes GIS and remote sensing technologies to extract land use information and generate indicators. Each approach offers unique advantages and applicability in different contexts (Fu et al., 2019).

Indicators and Dimensions of Liveability

Urban liveability assessment is influenced by various factors, including urban security, environmental health, and the convenience of daily life (Tao et al., 2014; Zhan et al., 2018). While researchers argue that socioeconomic attributes can impact livability assessment, this paper focuses on an objective evaluation method that does not consider personal attributes (Sofeska, 2017; Tang et al., 2017; Zanella et al., 2014). Urban liveability is a multi-dimensional concept that requires careful consideration from multiple angles, with urban geographers defining it as the extent to which a city meets the physical and psychological needs of its citizens (Pacione, 2003). Urban planning, architectural design, and geographical research add spatial dimensions to the inquiry, emphasizing the importance of planning and design in shaping urban liveability (Gurran et al., 2016; Kashef, 2016; Teo, 2014). The Sustainable Development Goals and the Healthy Cities movement underscore the significance of creating healthy, liveable, and sustainable cities, particularly in the face of global challenges

such as climate change and urbanization (Alderton et al., 2019; Jackson et al., 2013). Socio-economic factors like gender, age, education, income, and occupation also play a crucial role in influencing urban liveability, highlighting the complex interplay between individual characteristics and urban environments (Daraei & Mohajery, 2013).

III. Discussion

The paper provides a comprehensive examination of urban liveability, highlighting its multifaceted nature and various dimensions. It emphasizes the importance of considering both environmental and human variables in assessing liveability, encompassing factors such as residential status, environmental aspects, inequality, transport, mobility, aging, and assessments utilizing remote sensing and GIS-based techniques. By integrating these dimensions, the paper offers valuable insights for policymakers, urban planners, and researchers striving to create sustainable, inclusive, and vibrant communities. One key aspect of the paper is its discussion on the concept of liveability, which revolves around creating living environments that prioritize residents' well-being and happiness. It acknowledges the complexity and heterogeneity of urban liveability, influenced by diverse perceptions and experiences of residents, making standardized assessment challenging across cities. Nonetheless, the paper underscores the importance of improving liveability to promote residents' health and well-being while reducing a city's environmental impact, highlighting its significance in urban planning and design. The methodology section outlines a systematic approach to reviewing and synthesizing existing research across multiple disciplines, ensuring thorough coverage of the topic. By critically analyzing the selected literature and integrating qualitative and quantitative data, the paper provides empirical support for its findings. Furthermore, the paper discusses various dimensions of liveability, including residential status, environmental aspects, inequality, transport, mobility, and aging. It highlights the interconnectedness of these dimensions and their impact on urban liveability, emphasizing the need for a holistic approach in urban planning and policy-making.

Overall, the paper contributes to the understanding of urban liveability by offering a comprehensive framework and discussing key dimensions and indicators. It serves as a valuable resource for stakeholders involved in shaping the future of cities, guiding efforts to create sustainable, inclusive, and vibrant urban environments.

IV. Conclusion

In conclusion, this paper highlights the multidimensional nature of urban liveability and its significance in shaping residents' well-being and quality of life. By incorporating factors such as environmental sustainability, social inclusion, economic prosperity, and cultural amenities, urban planners can create more resilient, vibrant, and equitable cities. The evolving concept of liveability is closely tied to global sustainability goals, as evidenced by international agreements like the Sustainable Development Goals and the New Urban Agenda. However, the paper also acknowledges the challenges associated with measuring and evaluating liveability due to diverse perspectives and evaluation criteria. Despite these challenges, the discussion emphasizes the importance of integrated approaches and collaboration across sectors to address urbanization challenges and create healthier, more sustainable, and inclusive urban environments. The paper underscores the need for policymakers, urban planners, and researchers to consider a holistic approach to urban development, integrating environmental, social, economic, and cultural considerations to enhance urban liveability and improve residents' overall quality of life.

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