Urban human needs: conceptual framework to promoting urban city fulfills human desires

Shaimaa S. Alsayed ⓘ*

Department of Architecture Engineering, College of Engineering and Information Technology, Buraydah Private Colleges, Buraydah, Saudi Arabia

Cities have been created to meet human needs, but creating sustainable societies has become a major challenge in light of the planners' broad interest in creating smart cities or giving exclusive priority to the environmental dimension of sustainability. This is one of the goals related to sustainable development (SDGs) and therefore, the human perspective of urbanism is considered a future challenge in achieving (SDGs). The research aims to bridge the gap in previous studies and highlight the integration of human needs in plans for urban human cities. It also aims to create a conceptual framework that leads to a new theory of urban needs by bridging the knowledge gap in previous studies by considering modern numerical analysis tools, Thus, a bibliometric analysis based on the Biblioshiny and VOSviewer tools within the scope of human needs and urban cities promotion was accomplished. Next selecting evaluation criteria for human needs through a comparative critique of the most important theories of human needs. Then deducting the new theory of urban needs and linking it to the elements of urban composition. Results have reached a new framework that clarifies the human needs that need to be achieved and links them to the urban components to create an integrated urbanization that fulfills the desires of the population. This research serves as a reference for reevaluating urban directions and modern theories that aim to develop future cities. It also helps evaluate cities, envision future human needs, and achieve future prosperity for cities.

KEYWORDS

human needs, urban components, future city, urban cities, urban human needs

1 Introduction

The concept of human needs is extremely valuable in maximizing the potential of individuals as drivers of sustainable development. it will result from that by creating living conditions that enable residents to satisfy their needs, including social well-being and empowerment, it can lead to higher levels of life satisfaction. Consequently, this may strengthen the bond between individuals and their place of residence, as well as their willingness to take action in favor of the overall living environment (Rodzoś, 2019).

The exaggeration in implementing the idea of modern trends in cities has overlooked the primary goal of establishing these cities, which is the human being and his needs through urbanization. Many of these trends think of the city only from an economic perspective (Gibbs et al., 2013), which is an unfair view as they seek to find solutions to the technical and economic problems of the future and the marginalization of humans and their current social problems. It will result from the application of these trends in the future, as

it is based on dealing with cities from a narrow and limited perspective, such as the technical and economic perspective (Rossi, 2016; Caprotti, 2018), which works to reshape cities by applying modern technologies under the pretext that they facilitate life (March and Ribera-Fumaz, 2016), and working to raise economic efficiency, so cities became viewed as a set of technical problems that must be solved through applying digital technologies as an economic opportunity for governments and technology companies (Caprotti, 2018).

The focus of these trends on one aspect of city planning was that they did not provide solutions to the emergence of diseases and epidemics such as COVID-19. It showed the flaw in governments' control over the built environment and did not provide health and safety for citizens. Indeed, there has been an outbreak in many cities as climate change continues to this day, with the presence of global warming problems and the emergence of many social and economic problems such as unemployment, disparity in the classes of society, increased poverty in many countries, the occurrence of social isolation, and a decrease in community interaction and participation among residents and decision-makers as well.

Hence, the importance of creating cities that meet human needs and integrate them as a priority in urban planning. This is achieved by answering several questions:
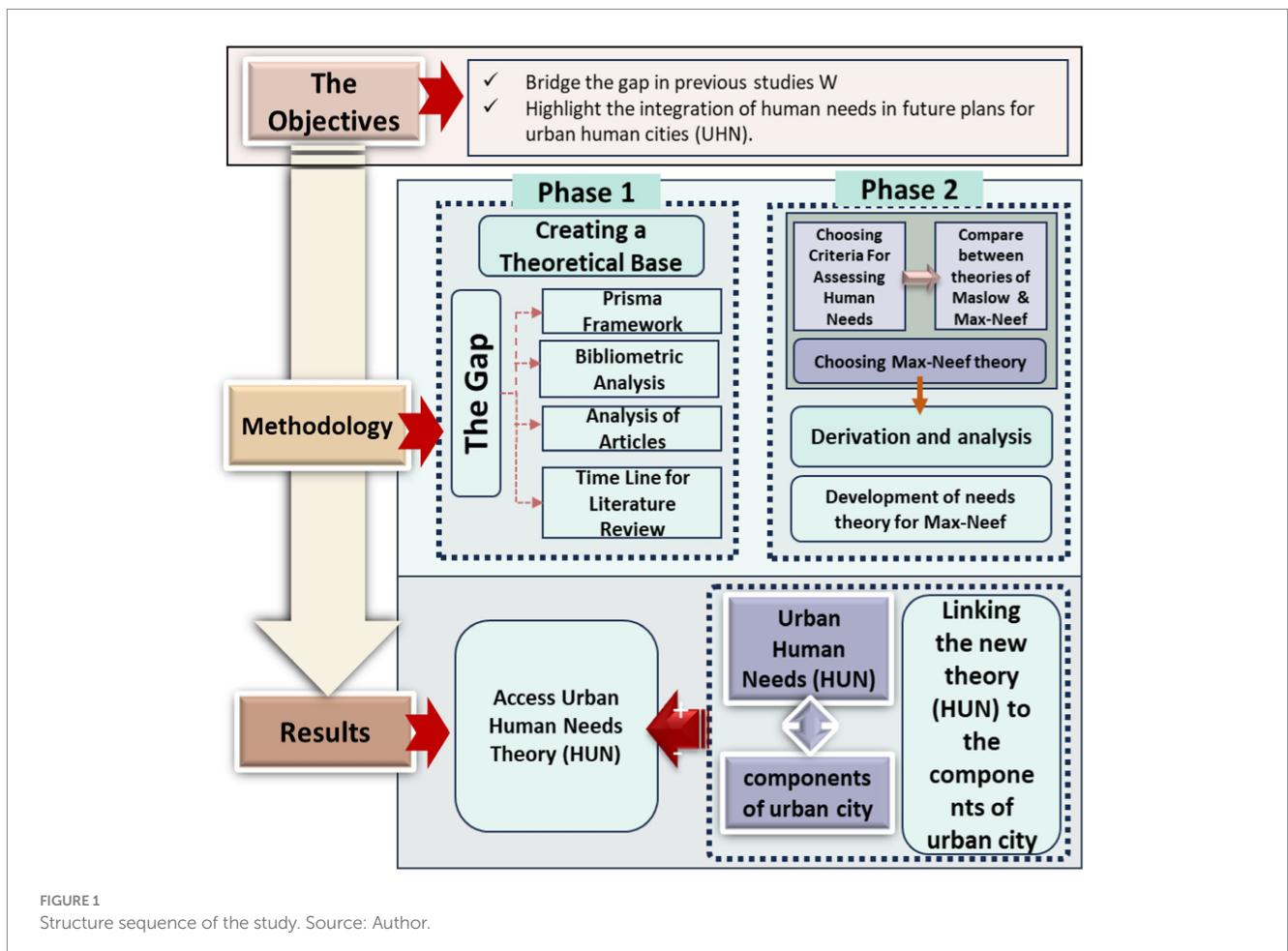
1. How important is it for researchers to study human needs in urban planning, and what is the research gap?
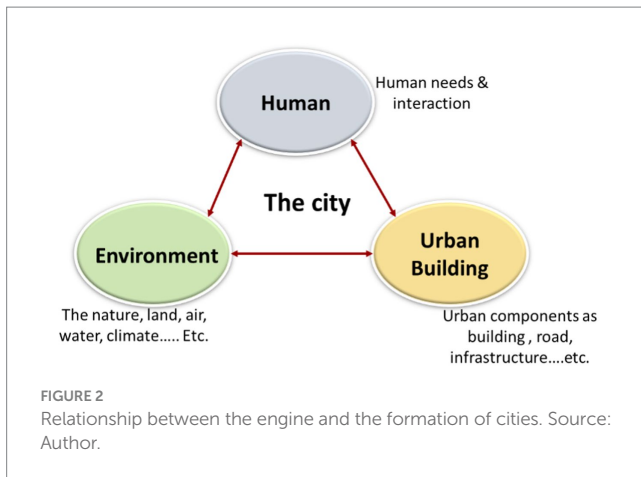
2. What is the meeting point of theories of psychology and sociology in studying human needs with the formation of urban cities?
3. What is the concept of urban human needs (UHN)?
4. How do integrate urban human needs with the formation of urban cities?

The research aims to bridge the gap in previous studies and highlight the integration of human needs into plans for urban human cities (UHN). It also aims to create a conceptual framework that leads to a new theory of urban needs. As shown in Figure1, the rest of this article is organized as follows. Section 2 provides variables for UHN. Section 3 presents the method of theoretical base that is related to bibliometric analysis based on both the Biblioshiny and VOSviewer tools within the scope of human needs and urban cities. Followed by a focus on theories of human needs and choosing criteria for assessing human needs and determining urban components in Sections 4 and 5. Section 6 highlights the concept of HUN. Section 7 discusses the research results and finally, Section 8 presents the conclusion.

2 Variables for UHN

Cities are complex and dynamic systems (Fan et al., 2023). It depends on several variables, as shown in Figure 2, and the relationship between humans, urbanism, and the environment is considered the primary driver of the formation of cities. Human needs refer to a set

FIGURE 1
Structure sequence of the study. Source: Author.

FIGURE 2
Relationship between the engine and the formation of cities. Source: Author.

of personal, economic, social, and political requirements for people to avoid serious harm, achieve their goals, live fulfilling lives, and participate in societal development (Tay and Diener, 2011; Mutică, 2013; Cardoso et al., 2022).

Urban components are various facilities within the urban management public area (Zhang et al., 2019), the relationship between human needs and the components of urban cities is complex, but it is clear that there is a strong interconnection between both of them. Human needs and the components of urban cities are closely linked, as the design, planning, and development of urban areas aim to meet human needs and improve their quality of life. Urban city components refer to the physical and social elements that make up a city, including buildings, infrastructure, transportation, public spaces, and social institutions. Needs, on the other hand, refer to the necessities and wants that people have for their physical, social, and emotional well-being, such as access to clean water, food, shelter, education, healthcare, social interaction, and cultural activities. Urban design and planning must take these human needs into account to ensure that city components respond to the needs of their residents.

The concept of the modern city and its definition as an economic and social system has sparked criticism. Bunkse (1979) argues that this definition is narrow and fails to address basic needs. Ignoring local factors and individual needs results in a social system devoid of any emotional connections with its members. In response, Maclean (1983) proposes initiatives to develop communities in the Riccarton area of Christchurch, focusing on meeting human needs through community work and development. Lowe (1991) discusses the inability of poorly planned urban areas to meet human needs by reviewing issues faced by both industrialized and developing countries, such as transportation, energy, water, housing, services, employment, and conditions necessary to make cities more humane. Following this, Shrestha and Taniguchi (2003) emphasized studying the provision of affordable housing as a basic need. Focusing on studying developing countries (Drakakis-Smith, 1997) conducted a study on two basic needs of impoverished areas, such as food and housing, and how they integrate with other urban elements to improve the quality of life in urban areas.

Ji et al. (2021) argued that there is a research gap in experimental studies that specifically focus on the needs and preferences of citizens regarding sustainable urban services. There seems to be a lack of ability to design for the complexity of human needs and values

(Luckan, 2021). This was demonstrated through several international experiences, including the Paris experiment, where a local bike-sharing project was implemented for 5 years to reduce congestion and pollution. However, citizens perceived this project as ineffective because they believed that air pollution was not a problem in Paris (Bris, 2019).

Hence, scientific research began to focus on city planning from a different perspective, including (Mutică, 2013) who believes that modernist ideas in building cities are less than perfect. A dialogue is needed with sociologists, psychologists, and anthropologists when planning to create a new vision, which is to begin studying the needs of individuals. Thus, he submitted a study on the most important human needs that architecture must meet.

Consequently, research has turned toward incorporating the concept of meeting human needs in urban development plans, after being overlooked in modern urban trends. Seliverstov et al. (2020) have established that cities generate new needs, and Neufeld and Wohl (2022) confirm that in the face of technological and cultural changes, standard housing models have exceeded their capacity to keep up. Housing, in its simplest form, is used to meet basic human needs such as providing shelter and protection. However, today it requires diversity and meeting individual desires for space, luxury, privacy, and comfort.

According to Greene (1992) the concept of community design was introduced to meet basic human needs within broad concepts that encompass cognitive terms, architectural arts, visual arts, and urban design principles. The rapid development of cities has imposed a new diverse set of needs such as housing, work, social interaction, entertainment, transportation of goods and people, the need for nature, and green spaces for recreation and relaxation (Aliyeva et al., 2019). Dietrich (2021) believes that the city focuses not only on its residents but also on other services and facilities. This means that the city has a strong interaction with its surroundings. Therefore, it studies from a planning perspective the demand and resources to meet the city's needs to make it livable internally and with its surroundings to meet its needs.

3 Methods

The procedures used in this study can be partitioned into three main sections that involve choosing the generation of the database as well as the Biblioshiny and VOSviewer tools. The preferred reporting items for systematic reviews and meta-analysis (PRISMA) method were used to develop the database, as the subtitles below emphasize.

3.1 Generation of database

The development of a database presents an important step that directly influences the characteristics of the results. This study emphasized Scopus which can be considered the most available bibliometric source. Regarding the publication inclusion criteria, a literature search on Scopus was conducted by combining relevant keywords like "human needs," "urban," and "cities." The inclusion criteria of this article emphasized human needs and urban cities. When considering the publication filtering criteria, the search process was conducted using the titles, abstracts, and keywords of publication

FIGURE 3
Workflow of the selection procedure based on the PRISMA method.
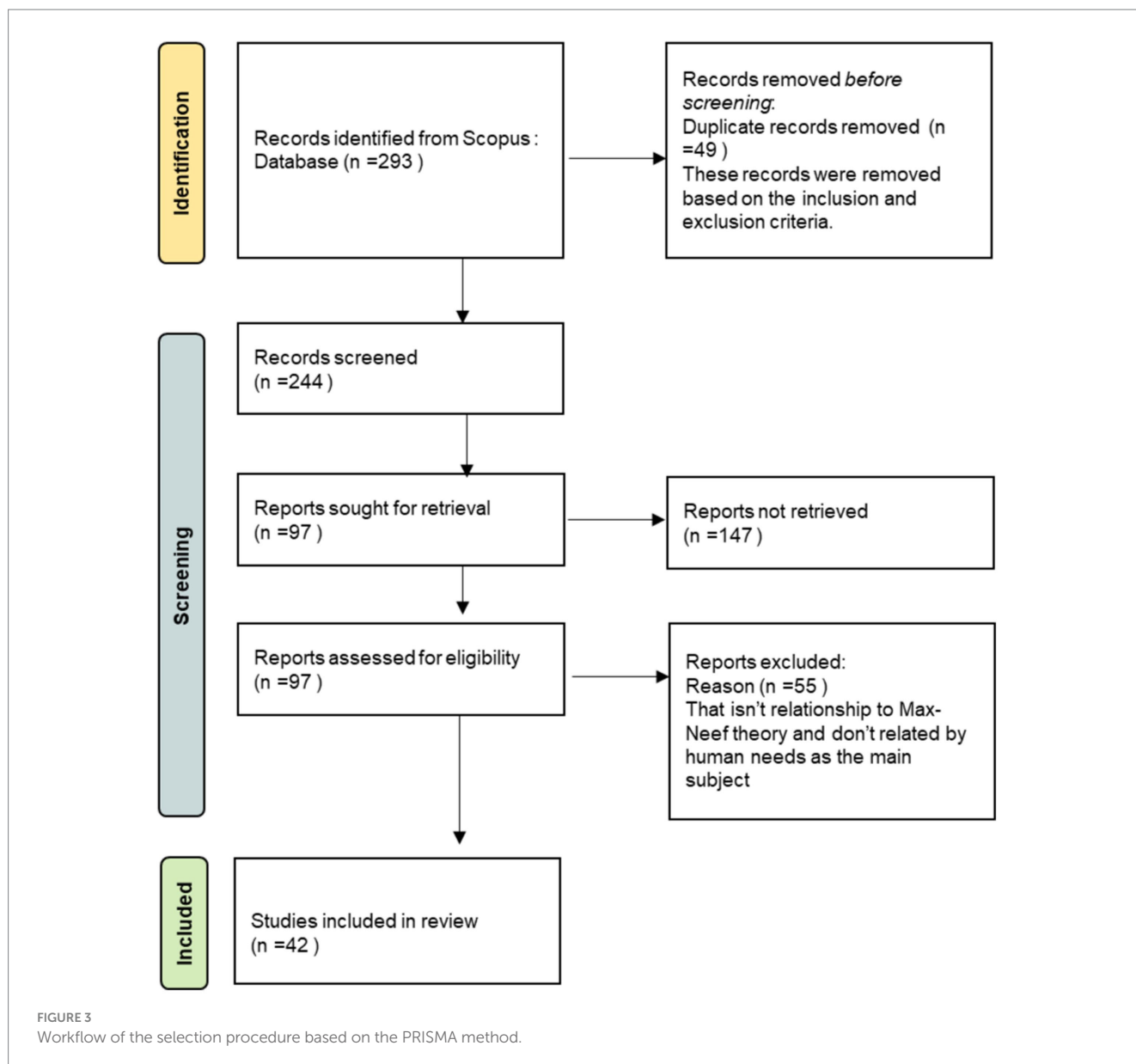
materials. A total of 293 publications were identified on 22 December 2023. Thus, the period for research was determined between 1960 and 2023. Furthermore, this study used two filters—subject area and language—to reduce the number of pertinent papers that fit the criteria. This study focused on "social science," environmental science, "engineering," "earth and planetary sciences," "arts and humanities," and "psychology" as a subject area. Publications that were authored in languages other than English were not included. A total of 244 documents were thus discovered that satisfied the basic filters. After the manual screening of the publication titles and abstracts to ensure that the research fits the goals and parameters, the objectives are to make sure that all keywords are in the right substantive context of the field of research, and 97 publications were found. Finally, the whole text of 97 publications was examined to determine whether they could be kept on as papers pertinent to the study's subject. Thus, as they were linked to the purpose of this bibliometric analysis several criteria were set by focusing on the review of research objectives, research methodology, and results: What is the relevance of it to the research topic? The study dealt with one of the theories of human needs and

I classified the studies based on the theories used in the study for urban or one of its components, and feasibility of practical application to a city sector, 42 were selected, as shown in Figure 3.

3.2 Selection of bibliometric tools

Documents, keywords, journals, authors, references, countries, and other entities in research fields can be visualized using the Biblioshiny and VOSviewer applications. As a result, both Biblioshiny (version 4.1.4) and VOSviewer (version 1.6.20) were used in this investigation.

3.3 Results of bibliometric analysis

3.3.1 Network analysis of co-occurrence

Research frontiers and hotspots can be identified via keyword co-occurrence analysis. Consequently, the bibliometric search

presented in this study was related to the clustering of the 50 most popular keywords throughout the previous years in the publications. The word cloud word dynamics of the authors' most frequently used keywords in human needs and urban cities are shown in Figure 4.

On the other hand, Figure 5 indicates the co-occurrence analysis network, in which colors present various clusters, and the cluster formation is based on the relationships between the objects, resulting in clusters of sections that are strongly related. The most frequently occurring keywords in the chosen publications, in order of highest occurrence, were urban planning (42 occurrences), urban area (37 occurrences), and human needs (28 occurrences). Such results propose relevant concerns on the possibilities of the numerical analysis of urban planning and human needs.

The co-occurrence analysis network was divided into six clusters, and the largest cluster (red color), which includes urban area, city planning, human and psychology, is shown in Figure 5A. In addition, the blue cluster includes urban planning and sustainable cities and urban ecology. The third cluster (green color) is urban design, greenspaces, biodiversity, urban ecosystem, accessibility, and green infrastructure. The fourth (yellow color) emphasizes human needs, urbanization, sustainability, and smart cities. Figure 5B highlights the evolution of the co-occurrence analysis network over time, which demonstrates the applications of urban development and human needs.

3.3.2 Thematic analysis

The four quadrants of the thematic map—niche themes, emerging or declining themes, motor themes, and basic themes—can easily plot and group the keywords to identify research themes Figure 6. The keywords "civil society," and "cemetery," are presented as niche themes. Nevertheless, the keywords "smart city," "architecture design," "environmental technology," "sustainability," and "urban transportation" are presented as emerging, despite their importance. In contrast, the keywords "ecosystems," "biodiversity," "urban area," and "human needs" were considered motor themes, which reflect well-developed and important themes. In contrast, "urban planning," "sustainable development," "urban development," "greenspaces," "urbanization," and "sustainability" reflected basic themes.

According to the thematic analysis, further efforts are required to develop important issues like "urbanization" and "smart cities," in addition to "urban area" in "urban planning" and their related effects on achieving human needs. Additionally, despite its importance, the

most popular terms did not sufficiently repeat the "geometric parameters" technique. Thus, additional study is required to investigate and apply such issues.

3.3.3 Most cited publications

Co-citation analysis was identified for the most globally cited publications, as shown in Figure 7. The top 10 articles have also been compiled in Table 1. The first, third, and tenth positions of the most cited application with 1,573, 454, and 83 citations, respectively, address the importance of urban nature for citizens (Thompson, 2002; Chiesura, 2004; Zwierzchowska et al., 2018). The publication ranks second and seventh position publications with 601 and 130 citations, respectively, identifying major challenges to managing biodiversity and ecosystem service and its effect on humans (Jansson, 2013; Aronson et al., 2017). The fourth-position publication with 354 citations was based on how the built environment contributes to the satisfaction of human needs (Tweed and Sutherland, 2007). On the other hand, the fifth and eighth positions with 224 and 117 citations, respectively, assess the ecosystem health of urban landscapes based on ecosystem services (Peng et al., 2015). The sixth and ninth positions with 171 and 109 citations examine supplies of water as human needs (Anderson, 2003; McKenzieb and Raya, 2009).

Based on an examination of the most widely cited publications, overall, good consistency could be observed between the results of co-citation for references and the co-occurrence of the analysis of the keyword.
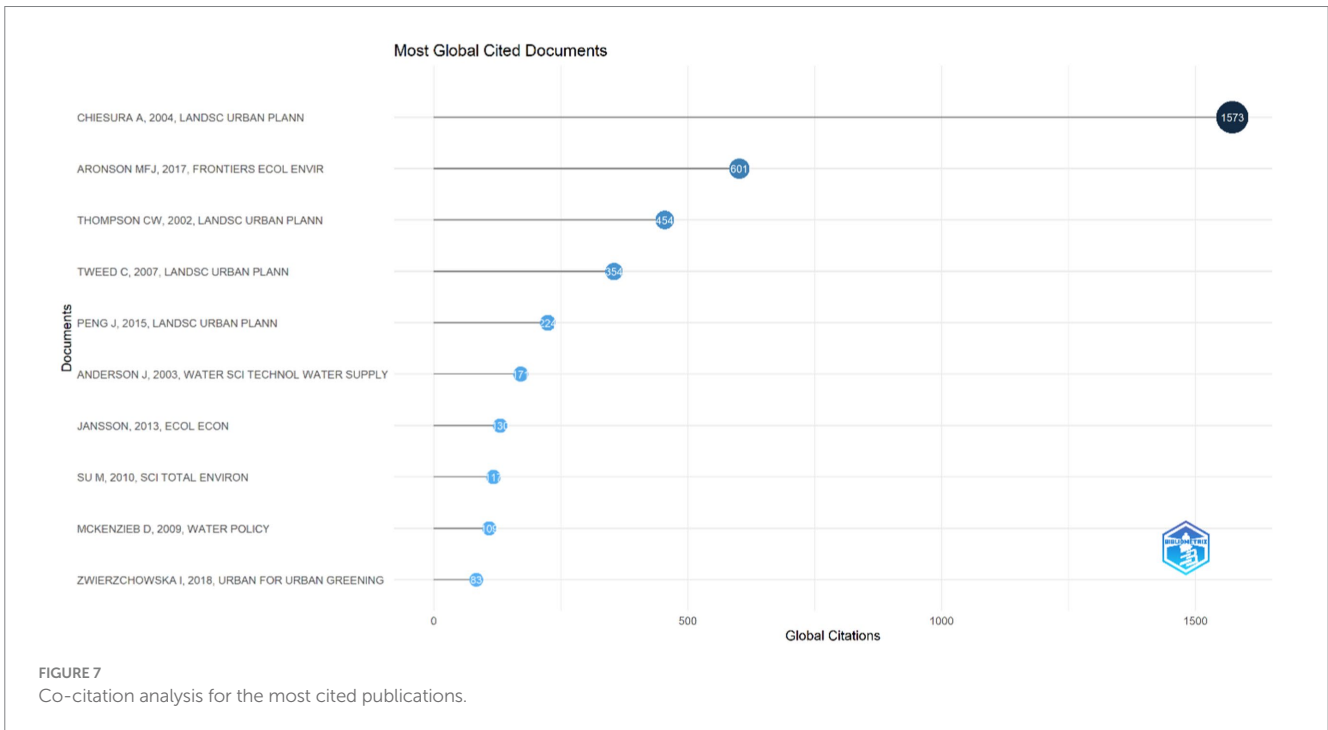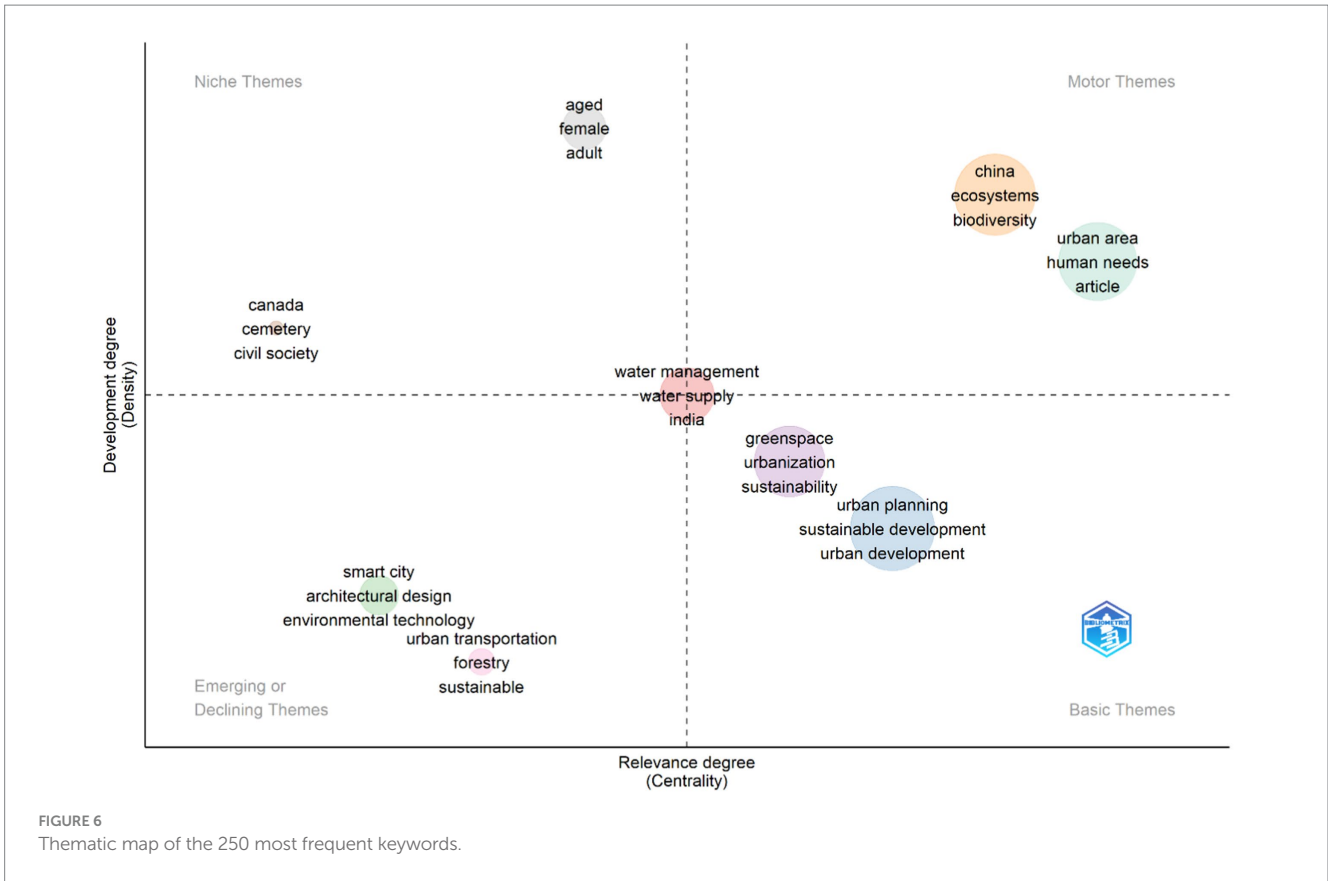
3.3.4 The impact and network of authors

In accordance with the author's impact concerning the total number of citations, Ardill N., Elshater A., Ismail S., Lix, and Yang Z. are the most cited authors, as shown in Figure 8A with three total citations in the research scope. However, concerning the authors' *H*-index, Ismail S., obtained the greatest value, followed by Aaof Kaz, Kash C., Chiesura A., Dietrich U., and Friedmann J. with an *H*-index of 2, as shown in Figure 8B.

Figure 8C shows the output of the top 10 authors over time, with the number of papers (circle size) and the total number of citations (circle color) every year. For Ardill N., a lecturer in the School of Architecture at the University of Brighton, and Fellow of the Higher Education Academy, and a professor of Urban Morphology at Ain Shams University (ASU), Cairo, Egypt, their documents in the research scope presented a greater number, so were the most productive authors. On the other hand, the size of the circles can be defined by the number of citations per 50 authors, which highlights the significance of the authors' network, as illustrated in Figure 9. The lines between the authors indicate linkages. The author's network included 18 clusters. The most cited authors in each cluster were Yang Z. (119 citations), Zlatanova S. (119 citations), Ismail S. (54 citations), Elshater A. (19 citations), and Mierzejewska I. (14 citations).

3.3.5 The network of source

The top 10 sources in the network that frequently published previous research can be used as an accurate indicator of a publication's credibility. The total number of citations of the top 10 sources according to the number of documents is shown in Figure 10, the journal Sustainability (Switzerland) came in first with seven citations, followed by the Journal of Landscape and Urban Planning with five citations.

FIGURE 5
Clustering of the co-occurrence network based on different clusters **(A)** and evolution over time **(B)**.

3.3.6 The network of countries

By using bibliographic coupling, it is possible to identify the countries that have made significant contributions to the research field, which sheds more light on the topic and explains why that specific method of study had been developed. In this context, based

on the number of documents, Figure 11 shows the top countries in the research sector.

The size of each node reflects how many documents each country has published. According to the results, the United States completed 36 documents with 1,221 citations, China completed 23 documents

FIGURE 6
Thematic map of the 250 most frequent keywords.

FIGURE 7
Co-citation analysis for the most cited publications.

with 493 citations, the United Kingdom completed 23 documents with 1,644 citations, Australia completed 12 documents with 268 citations, and Canada completed 10 documents with 689 citations. Three clusters formed, providing the number of publications: red cluster including (six items), green cluster (three items), and blue cluster (three items).

3.3.7 Annual scientific production

Figure 12 illustrates the distribution by years of human needs in urban cities studies publications between 1964 and 2023. Increasing productions in the last 20 years where, in 2023 and 2021, 20 and 40 and 20 publications were published on the other hand, In the period

TABLE 1 Top 10 most-cited publications.

Rank	Publication title	Journal	Total citations	TC over year	References
1st	The role of urban parks for the sustainable city	*Landscape and Urban Planning*	1,573	2004	Chiesura (2004)
2nd	Biodiversity in the city: key challenges for urban green space management	*Frontiers in Ecology and the Environment*	601	2017	Aronson et al. (2017)
3rd	Urban open space in the 21st century	*Landscape and Urban Planning*	454	2002	Thompson (2002)
4th	Built cultural heritage and sustainable urban development	*Landscape and Urban Planning*	354	2007	Tweed and Sutherland (2007)
5th	Linking ecosystem services and landscape patterns to assess urban ecosystem health: a case study in Shenzhen city, China	*Landscape and Urban Planning*	224	2015	Peng et al. (2015)
6th	The environmental benefits of water recycling and reuse	*Water Science and Technology: Water Supply*	171	2003	Anderson (2003)
7th	Reaching for a sustainable, Resilient urban future using the lens of ecosystem services	*Ecological Economics*	130	2013	Jansson (2013)
8th	Urban ecosystem health assessment: a review	*Science of the Total Environment*	117	2010	Su et al. (2010)
9th	Urban water supply in India: Status, reform options and possible lessons	*Water Policy*	109	2009	McKenzieb and Raya (2009)
10th	Multi-scale assessment of cultural ecosystem services of parks in central European cities	*Urban Forestry and Urban Greening*	83	2018	Zwierzchowska et al. (2018)

between 1960 and 2011, the number of publications did not exceed five publications per year.

3.4 Classification of publications

By classifying published research on human needs and urban cities into four basic classifications based on search engines and study methods. It was found that 42 types of research can be classified into research based on Maslow's theory of human needs, Max Neef's theory, and applying human theories to a limited scope of urban components. The last classification is based on creating its classification, as shown in Table 2 and the timeline in Figure 13.

4 Theories of human needs

Human needs theories are a group of psychological and social theories that aim to explain the basic needs, desires, and motivations that drive human behavior (Doyal and Gough, 1991; Danesh, 2012). These theories indicate that some innate needs must be met for individuals to feel satisfied and accomplished in life. Human needs have been identified in many ways for human life in societies (Hallsmith, 2003). Table 3 shows a group of the most famous theories in studying human needs:

Comparing the above theories, it is clear that the ideas behind basic human needs are the most developed and relevant (Max-Neef, 1991), and more comprehensive, flexible, and functional (Papachristou and Rosas-Casals, 2019; Abubakar, 2022) as he explains human needs as an interconnected and interactive system (Guillen-Royo et al., 2017), unlike

Maslow's theory, which views needs as organized in a hierarchy and that they are built based on a measure of importance as Max Neef believes.

The following can be indicated:

- Human needs vary as individual motivations or as social requirements, according to the approach to be taken.
- The priority of these needs varies from one society to another. The priorities of industrial societies differ from capitalist societies from agricultural societies, in addition to the difference in needs according to societal cultures.
- Cities are complex networks of interactions between humans and their environment within the framework of various urban elements to achieve these needs at the individual and societal levels.
- Therefore, it was found that when studying human needs at the city level.
- It is truer to look at them as an interactive network, as Max Neve sees it, and not as hierarchical needs.
- Depending on the nature of the society being studied, the relative weights of these needs vary, but their availability as an interconnected network is essential for building a healthy society.
- The goal of achieving these needs is to satisfy human and societal desires to achieve satisfaction and stability.

Therefore, the needs and requirements presented by Max Neef are considered an entry point for creating a basis for identifying urban needs, which can be linked to theories of human needs. Max Neef's theory can be highlighted as the closest; as it is based on integration between needs, it is based on the following points: understanding human
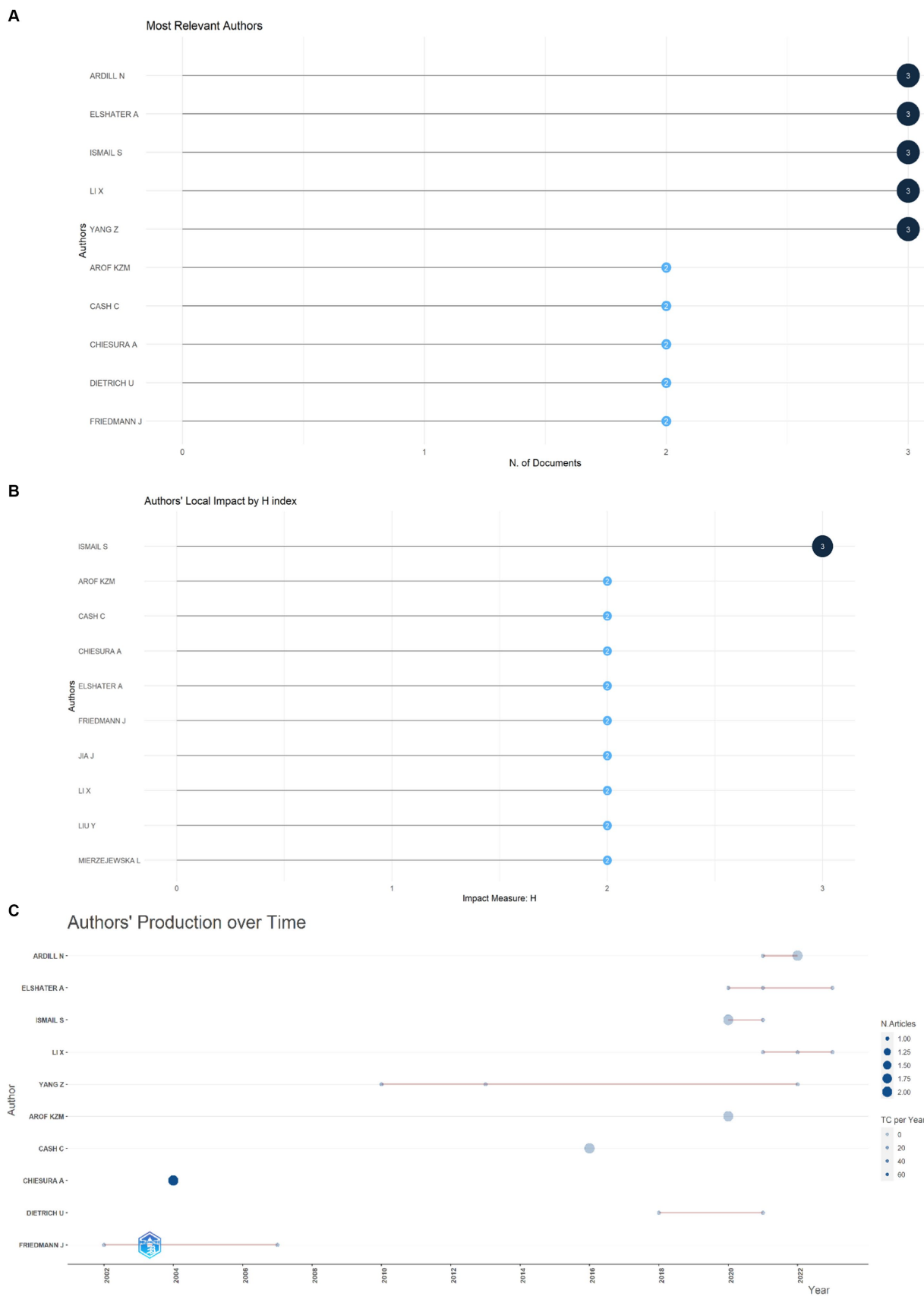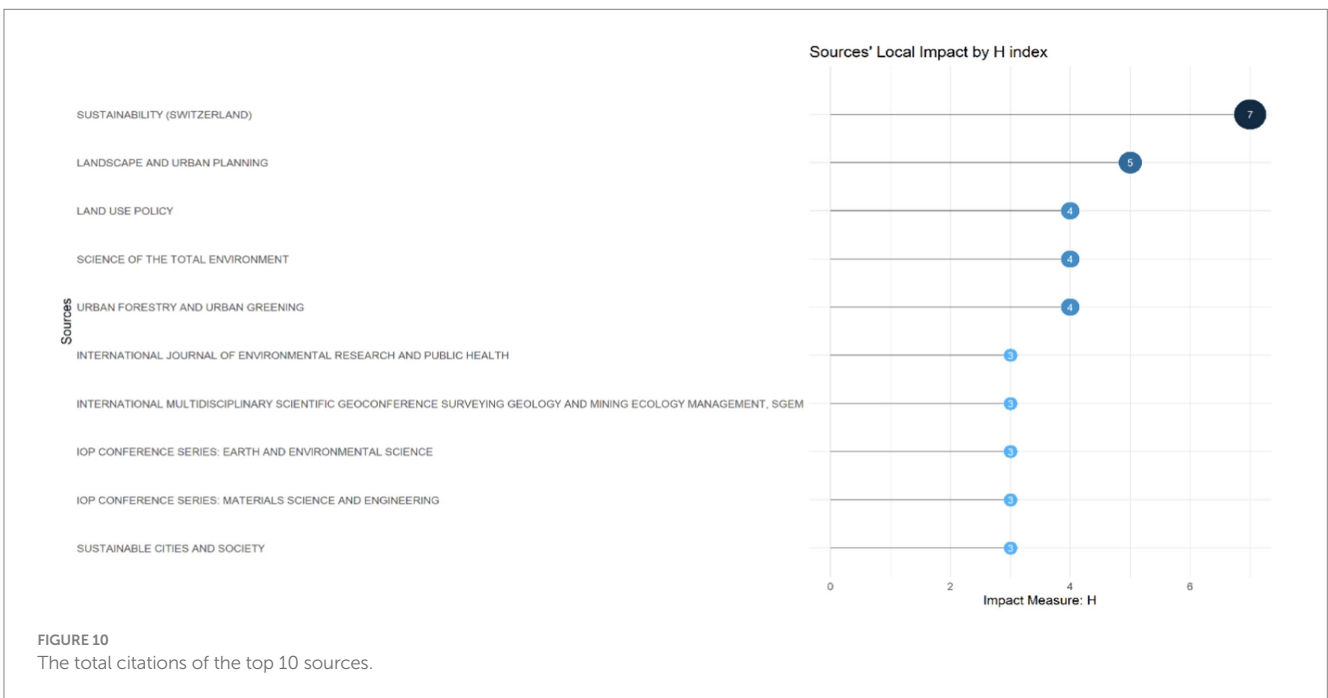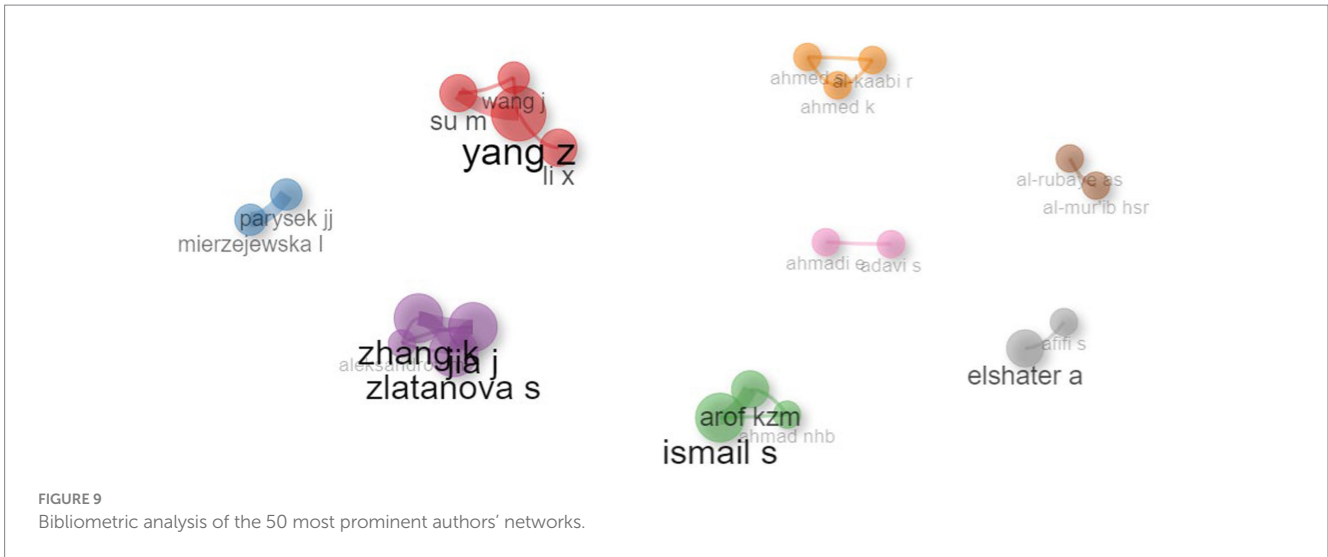
FIGURE 8
Bibliometric analysis of the top 10 authors: **(A)** total citations; **(B)** *H*-index; **(C)** production over years.

FIGURE 9
Bibliometric analysis of the 50 most prominent authors' networks.

FIGURE 10
The total citations of the top 10 sources.

needs and their complex interplay. An interactive, interconnected system. Needs are constant across all cultures and during different historical time periods but change is in the way these needs are met. Believes that one need is not more important than another need. There is no fixed order of precedence in the order of needs. It emphasizes the importance of social and environmental sustainability in addressing human needs.

While offering a comprehensive view of human needs, has some weaknesses to consider:
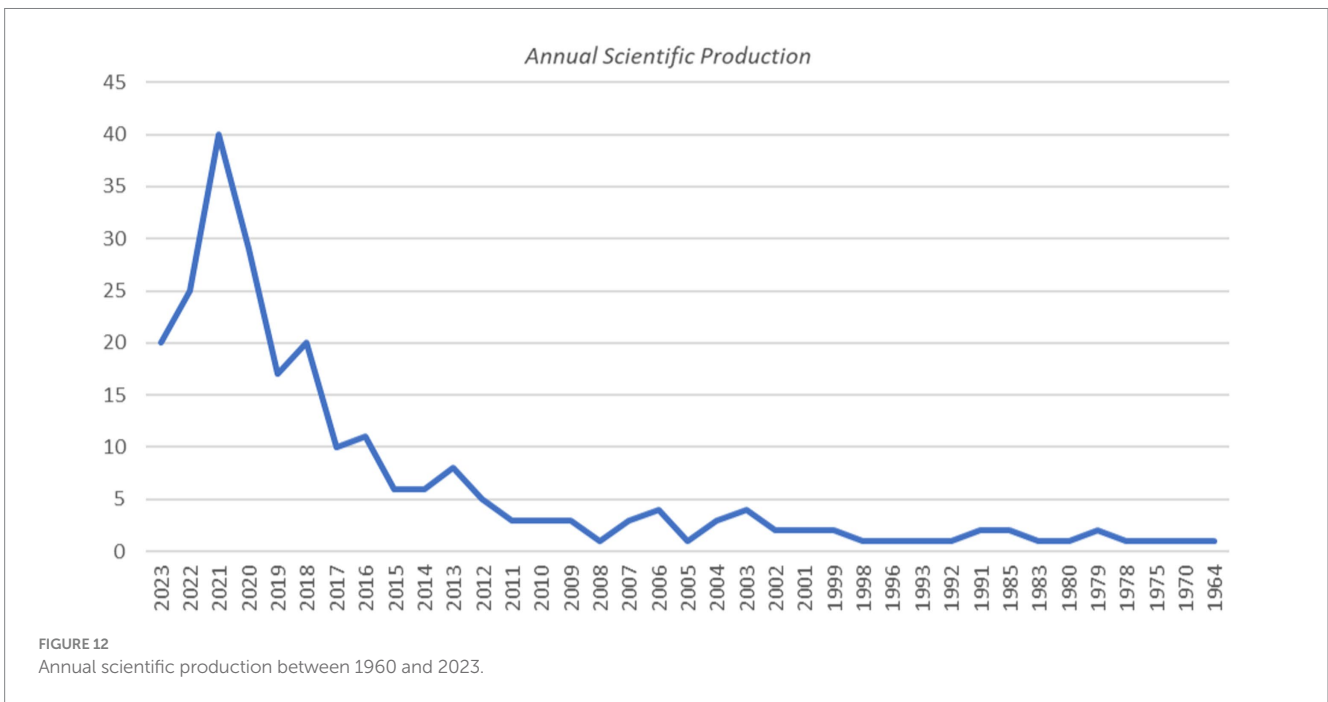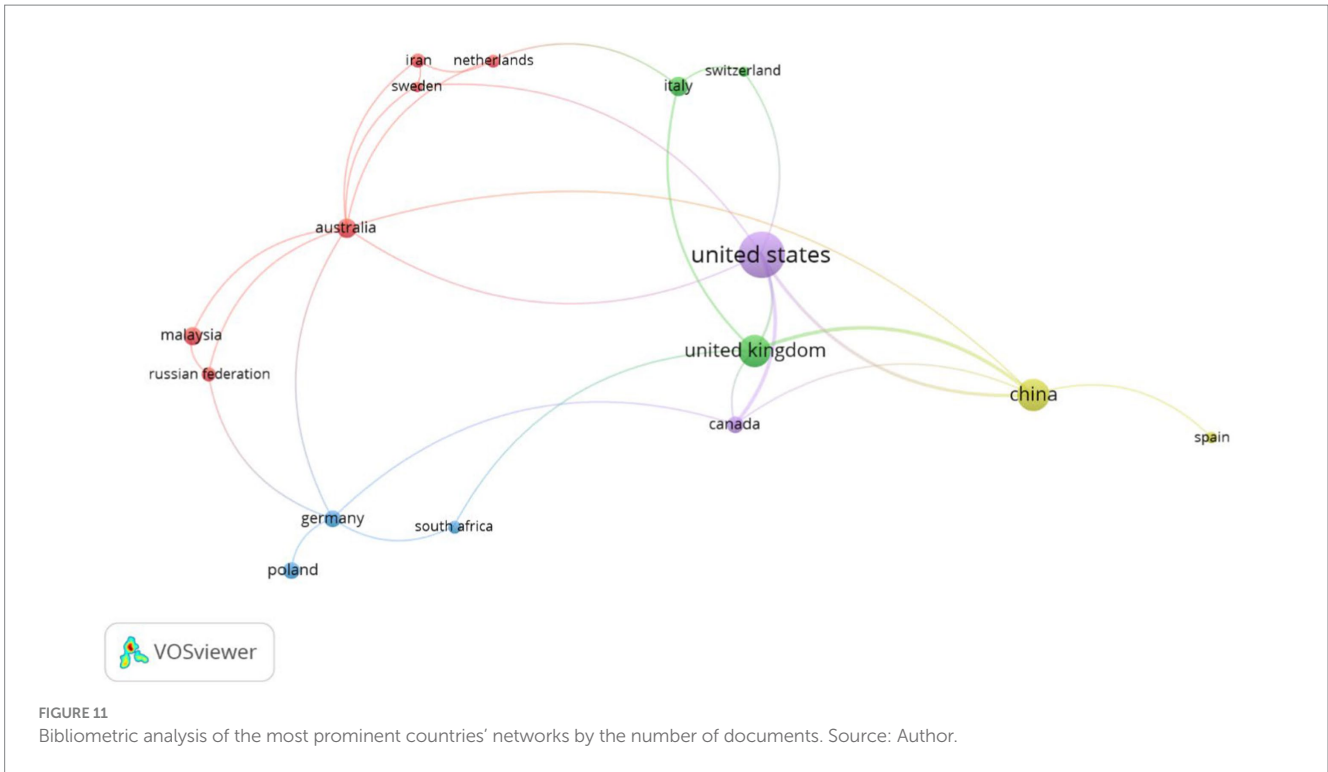
- The theory does not provide a clear framework for measuring need satisfaction across diverse populations.
- Limited focus on context: The theory does not explicitly account for external factors like social and economic inequalities that can significantly influence how needs are met.

- Focus on individual needs: The theory primarily focuses on individual needs. While acknowledging social connection as a need, it does not delve deeply into the dynamics of social structures and power relations that can affect need fulfillment.

By acknowledging the limitations, the theory can be used alongside other needs-based frameworks to create a more nuanced understanding of human motivation.

5 Components of urban cities

Cities are complex and dynamic systems (Fan and Zhang, 2023). Urban components are various facilities within the urban management public area (Zhang et al., 2019). Examining the

FIGURE 11
Bibliometric analysis of the most prominent countries' networks by the number of documents. Source: Author.

FIGURE 12
Annual scientific production between 1960 and 2023.

components of urban planning reveals that numerous prominent publications and scholarly articles have drawn upon a common set of elements, albeit with evolving terminology through time; nevertheless, they all concur on the physical aspects embodied by infrastructure, buildings, roads, transportation, and public areas (Cuesta et al., 1990; Venables, 2007; Dempsey et al., 2008; Coyle and Duany, 2011; Forsyth, 2014; Wong et al., 2015; Howard et al., 2016; Fun et al., 2018; Bibri and Krogstie, 2019; Krisztián Nagy, 2022). Certain scholars have delved deeper into these components,

particularly addressing the organization of sites, residential structures, pathways, streets, urban fabric, etc. Nonetheless, there is consensus that certain physical components are pivotal to the configuration and formation of a city, specifically infrastructure, transportation networks, buildings, public spaces, and land uses. The progression of contemporary urban planning trends, exemplified by the advocacy for human-centric cities and the promotion of intelligent, adaptable, resilient, eco-friendly, and sustainable urban areas, has necessitated the inclusion of additional criteria in city

TABLE 2 List of the analyzed bibliometric publications that are included in the review.

Label	References	Title	Methods (theory)	Highlights
1	Santoni et al. (2023)	Relocating illegal urban settlements and fulfilling the human needs through physical order: an evaluation of the Marunda flats in Jakarta, Indonesia	Maslow's hierarchy	Provided a classification of human needs in illegal dwellings into five levels: necessity, i.e., physical needs, security, social needs, self-reward, and self-actualization. They applied this theory to an illegal settlement in Indonesia
3	Marvi et al. (2023)	Defining the social-sustainable framework for smart cities	Maslow's hierarchy	Develop indicators for smart cities to achieve social sustainability and meet citizens' needs
4	Cardoso et al. (2022)	The cities we need: towards an urbanism guided by human needs satisfaction	Max-Neef theory	The provided study is about proposing a human needs-based framework for assessing and developing cities. It does not provide a specific answer to the query
5	Sheikh and van Ameijde (2022)	Promoting livability through urban planning: a comprehensive framework based on the "theory of human needs"	Maslow's hierarchy	Aim to assess and improve urban planning for promoting equitable and healthy communities, specifically focusing on Hong Kong. The framework illustrates that Hong Kong's urban livability issues go beyond basic provision, mobility, and sustainability
6	Wang et al. (2022)	Research on the optimal allocation of ecological land from the perspective of human needs—taking Hechi city, Guangxi as an example	Applying to Hachi city	The article discusses the optimal allocation of ecological land in Hechi city, Guangxi from the perspective of human needs, including material needs, security needs, and spiritual needs
7	Gu et al. (2022)	Measuring residents' perceptions of multifunctional land use in peri-urban areas of three Chinese megacities: suggestions for governance from a demand perspective	Maslow's hierarchy	Found that the need for self-esteem is followed by the need for safety, physiological, and social needs, based on their application in three Chinese cities
8	Palmer et al. (2022)	Urban research for sustainability: developing a comparative transdisciplinary co-production approach to realise just cities	Max-Neef approach	It evaluates eight cities globally to address the achievement of fair cities through a classification that allows for comparing urgent local priorities. Many researchers have conducted studies on human needs in various cities and linked them to their environmental culture and specific problems
9	Neufeld and Wohl (2022)	Experiments in living together		The article is about a housing project called Railside in Winnipeg. It discusses the need for housing models to adapt to the changing world and the lack of diversity in current housing projects
10	Ye et al. (2022)	Physiological and psychological influence of multi-media in urban business districts		Believes that understanding the complex interaction between human needs and physical facilities in public places represents a challenge due to the knowledge gap in the design and research of sustainable cities. Therefore, he conducted a comparative study on the physiological and psychological effects of six commercial corridors to achieve the optimal design of multimedia on the functional corridors of the business district
11	Saloma and Akpedonu (2021)	Parks, plans, and human needs: Metro Manila's unrealised urban plans and accidental public green spaces		Applied it to public green spaces in Manila. Contemporary uses of these spaces suggest that the intermingling of the upper and lower classes as envisioned in these plans is limited; nonetheless, they represent endeavors by fairly diverse groups to actively satisfy human needs within and beyond how these spaces were initially designed

(Continued)

TABLE 2 (Continued)

Label	References	Title	Methods (theory)	Highlights
12	González-Méndez et al. (2021)	Agent-based modeling for urban development planning based on human needs. Conceptual basis and model formulation		Presented a study that was an agent-based model (ABM) for urban development planning based on the relationship between city inhabitants and the satisfaction of their basic needs with their physical environment
13	Aktaş and Dönmez (2021)	An urban paradox: urban resilience or human needs		Stated that change, transformation, and adaptation expected to occur with the concept of urban resilience cannot be considered separate from human and human welfare
14	Lam et al. (2021)	A demand-side approach for linking the past to future urban-rural development	Maslow's hierarchy	Updated Maslow's hierarchy of needs into a system based on indicators and the needs of developing countries to meet contemporary physiological and psychological needs, serving as a driver for economic and cultural growth in developing countries
15	Ji et al. (2021)	Towards people-centric smart city development: investigating the citizens' preferences and perceptions about smart-city services in Taiwan		A study was conducted to assess citizens' preferences in Taiwan and analyze 35 smart city services to enhance sustainable urban development and achieve societal well-being
16	Dietrich (2021)	Space needed to make a city sustainable and necessary changes to reach it: the case of Germany		This article investigates what a sustainable city could be. Starting from the human needs a livable city is sketched regarding its density and internal organization, land use, buildings, and their arrangement. The potential of harvesting renewable energies and food per land unit is estimated. The present demand leads to an immense need for land to cover it
17	Zeng et al. (2020)	Humanistic demand and spatiotemporal perspective in the evaluation of urban life quality—a case study of Shandong province in China	Maslow's hierarchy	Found through its application in the city of Shandong—China that the human demand and spatiotemporal perspective are necessary for assessing the urban life image. Therefore, they created a new evaluation system based on the relationship between people and the environment to assess the quality of life based on Maslow's hierarchy of needs
18	Çelikyay (2020)	Empathic design approach to public space organization in the urban environment	Maslow's hierarchy	Presented the empathetic design of public spaces in the urban environment. Following this, a group of researchers developed and updated studies based on Maslow's hierarchy to match the needs of the era
19	Arof et al. (2020a)	Exploring opportunities of adopting biophilic cities concept into mixed-use development project in Malaysia		Called for the creation of a biophilic city that is closer to human and environmental needs while being able to manage rapid urbanization and population growth
20	Arof et al. (2020b)	Critical strategies for construction players in the adoption of biophilic city concept in Malaysia		Called for the creation of a biophilic city that is closer to human and environmental needs while being able to manage rapid urbanization and population growth
21	Seliverstov et al. (2020)	Development of transport infrastructure organization model for modern cities with growing effectiveness		The article discusses the development of a transport infrastructure organization model for modern cities with growing effectiveness
22	Gimelli et al. (2019)	Linking water services and human well-being through the fundamental human needs framework: the case of India	Max-Neef approach	Focused on studying the availability of water through the concept of Max-Neef as a human need that goes beyond the concept of survival

(Continued)

TABLE 2 (Continued)

Label	References	Title	Methods (theory)	Highlights
23	Rodzoś (2019)	The concept of human needs in sustainable development of cities | Teoria potrzeb ludzkich w rozwoju zrównoważonym miast	Maslow's hierarchy	The theoretical importance of meeting human needs and reaching the conclusion that creating a certain environment allows its inhabitants to meet their needs, including social welfare needs, which leads to a higher level of satisfaction with their lives that may translate into stronger relationships with society
24	Hurly and Walker (2019)	Nature in our lives: examining the human need for nature relatedness as a basic psychological need		Discussed the human need for connection to nature as a fundamental psychological need
25	Papachristou and Rosas-Casals (2019)	Maximising the degree of user choice: a simple tool to measure current levels of quality of life in urban environments	Max-Neef approach	Relied on the Max-Neef (1991) model of human development to measure the current levels of quality of life in urban environments by assessing the extent to which human needs are met
26	Illia Ibrahim and Diyana Nizarudin (2019)	Human interaction theory for sustainable city		Discussed the theory of human interaction and how to meet human needs through open urban spaces. In the same context
27	Aliyeva et al. (2019)	Urban area planning and environment in Kazakhstan's cities: case of Almaty	Applying by Almaty	It believes that the rapid development of cities imposes a new variety of needs, such as housing, work, social interaction, leisure, movement of people and goods, and the need for nature and green spaces for recreation and relaxation
28	Caprotti (2018)	Future cities: moving from technical to human needs	Applying to Brazil	Highlights the importance of prioritizing human needs in plans for new cities
29	Rodrigues (2018)	Local government aimed at quality of life in sustainable cities		Discusses the development of Brazil and meeting its basic needs
30	Wisting (2017)	Managing urban development based on human wellbeing		Came up with indicators to measure the quality of well-being in urban areas based on the theory of human needs to be a basis for urban development processes. The change, transformation, and adaptation expected to occur with the concept of urban resilience cannot be considered separate from human and human welfare
31	Beck and Villarroel Walker (2013)	Nexus security: governance, innovation and the resilient city		Discuss the concept of flexibility through the concept of "meeting needs" to achieve a balance between evaluations of environmental security and the individual's sense of belonging to institutions and governance
32	Liu and Tan (2010)	Functional analysis of the land-use system in urban residential areas	Maslow's hierarchy	Analyzed land use function and identified the functional level in residential areas based on Maslow's hierarchy
33	Tweed and Sutherland (2007)	Built cultural heritage and sustainable urban development	Maslow's hierarchy	Criticized most of the efforts made to achieve sustainable development through Maslow's hierarchy in their study on the role of cultural heritage in sustainable urban development. They found that these efforts focus on the lower levels of the hierarchy, ignoring the higher levels, arguing that basic needs must be met at the bottom of the pyramid before attempting to satisfy others. They concluded that the relationships between the levels are complex and that it is not necessary to completely meet needs at one level before feeling the deficiencies in the higher levels

(Continued)

TABLE 2 (Continued)

| Label	References	Title	Methods (theory)	Highlights
34	Kochtitzky et al. (2006)	Urban planning and public health at CDC		Urban planning should include assessing and planning for the community's needs in various areas such as transportation, housing, and others. From here, the needs are connected to different urban sectors or components, and urban planning and public health aim to improve human well-being by emphasizing the evaluation of needs and the provision of services
35	Alperyte (2006)	Cultural needs of Lithuanian inhabitants in the context of global consumer culture		Focuses on cultural needs and how thinking about human needs has changed in the general concept of spaces. This research was applied to the Lithuanian population and reached several conclusions, the most important of which is that cultural activities are an important element in leisure time
36	Shrestha and Taniguchi (2003)	A holistic approach for providing affordable housing to the urban poor of Nepal		The article proposes a holistic approach to providing affordable housing to the urban poor in Nepal, integrating various aspects of housing and addressing the associated factors collectively
37	Hallsmith (2003)	The key to sustainable cities: meeting human needs, transforming community systems		The article discusses the need for a new approach to city planning that focuses on meeting human needs and transforming community systems for sustainable cities
38	Hallsmith (2003)	The key to sustainable cities: meeting human needs, transforming community systems		Discussed the importance of meeting human needs for sustainable cities and proposed a new approach to urban planning that focuses on developing social, economic, and environmental health systems and governance
39	Drakakis-Smith (1997)	Third world cities: sustainable urban development IIIÐ basic needs and human rights		Focusing on studying third world countries, he studied two of the basic needs of poor areas, such as food and housing, and how they are integrated with other urban elements
40	Greene (1992)	City shape: communicating and evaluating community design		This article presents a framework or taxonomy for community planners and designers to use to help citizens understand and evaluate community designs
41	Lowe (1991)	Shaping cities: the environmental and human dimensions		The article discusses the impact of urban planning on human and planetary well-being, including the tie between land use and transport, energy use in buildings, underground water, exclusionary land use controls, and making urban areas more humane
42	Maclean (1983)	Human need and community initiatives in an urban setting	By applying in Christchurch City	Some characteristics of this pocket Borough bounded by Christchurch City and Waimarie District are introduced, followed by a discussion of community work, its administrative context, and development
43	Bunkse (1979)	The role of a humane environment in Soviet urban planning	By applying in Riga, Latvia	It is shown that rational, socioeconomic solutions for urban development largely ignore local factors and the needs of individuals. The resulting landscape represents an abstract social system, and it is unlikely that individuals will form affective bonds with it
44	Greenbie (1978)	A model for accommodating the human need for small scale communities within the context of global cooperative systems	Theories of P. D. MacLean and J. B. Calhoun (small American+ cities)	Discusses a theoretical model that indicates the possibility of meeting the human needs of small communities through global cooperative systems, by applying it to a small American city
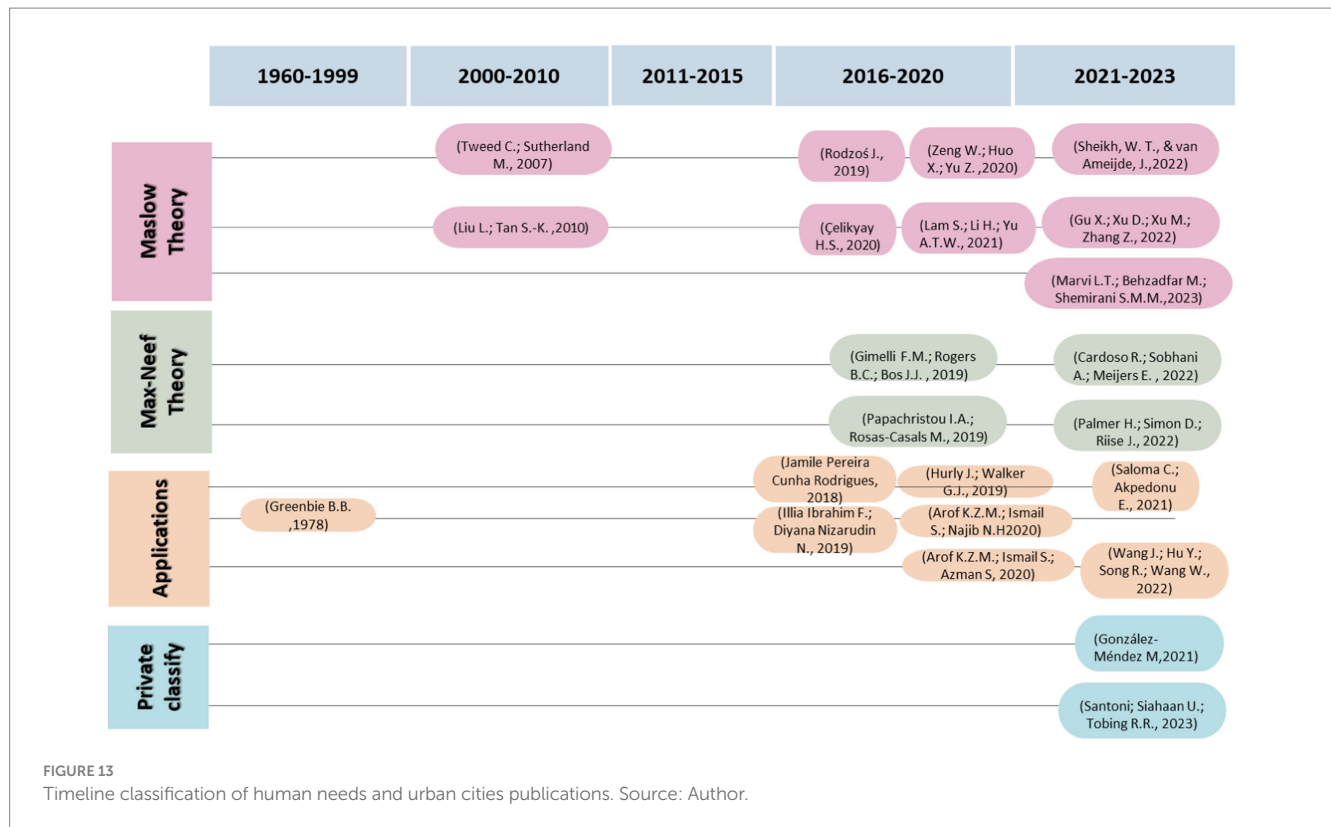
FIGURE 13
Timeline classification of human needs and urban cities publications. Source: Author.

development to align with advancement and the anticipated urban landscape. Consequently, the study developed basic elements of cities for investigation, focusing on future human needs that change with sustainability. It outlined urban city elements considering physical and motivational factors, aiming to promote synergy among cities, humans, and the environment. This conceptual framework is illustrated in Figure 14.

6 Urban human needs

The cities function as a complex system comprising a variety of interconnected elements that interact with one another, with each component engaging in various interactions with multiple other elements. Despite the presence of established principles and standards guiding urban planning and the development of individual elements within it, there exists a lack of uniformity in the approach to defining its spatial voids, which varies from one location to another based on a range of factors such as the influence of cultural and social dynamics, the unique requirements of each void, and the specific spatial and geographic conditions at play. This variability results in a degree of flexibility in the design and planning of the city's elements and their interconnections.

From this point of view, it has created a convergence point for understanding urban needs by linking them to the components of urbanization by building a theoretical framework for the study of human needs based on:

- Flexibility in identifying human needs, where it must be a series that is capable of multiple interpretations with changing times.
- These needs should be integrated and interconnected, and not each one individually.
- They should consider cultural and spatial changes.

- They should also consider the different requirements from one person to another and cover all human needs as much as possible.

Many theories of human needs are addressed in various ways with different indicators, but through the previous discussion of theories of human needs, we find that Max Neef's theory, in general, provides a strong foundation to build on, but it needs some additions to address the shortcomings of considering the influence of the social and cultural context and taking into account individual and social needs and the dynamic, changing nature of needs, which allows us to have a deeper understanding of human needs and the possibility of achieving them in addition to identify an entry point that caters to human necessities using the urbanization elements. Upon analyzing the constituents of the urban environment, we observe them as interconnected parts, making it impractical to develop a cohesive cityscape in isolation without the presence of all essential elements for human needs. So, the urban human needs (UHN) framework serves as a structured approach aimed at elucidating the essential requirements of individuals that must be met, effectively establishing a connection between these needs and the various components within urban settings. This framework ultimately strives to facilitate the development of an interconnected urban environment that is capable of satisfying the aspirations and necessities of the populace. The formulation of this framework involved a meticulous process of extracting the fundamental UHN elements based on the above, human urban needs were formulated as shown in Figure 15.

Figure 16 shows the components of urban needs based on Max Neef's human needs, which consist of 12 components: subsistence (existence), health and safety, identity and belonging, creativity and innovation, leisure, knowledge, freedom, flexibility and renewal, self-esteem, power, relationships and participation and justice.

TABLE 3 A comparison between different theories of human needs.

|	Theory	Needs	Key points
Maslow's Hierarchy of Needs (1954) (Santos and Martins, 2007)	Proposed by Abraham Maslow, this theory suggests a pyramid-shaped hierarchy of five needs. People are motivated to fulfill basic needs at the lower levels before moving on to higher-level needs (Wisting, 2017)	1. Physiological 2. Safety 3. Love/belonging 4. Esteem 5. Self-actualization (pyramid structure)	- It suggests that individuals must satisfy lower-level needs before progressing to higher-level needs - The theory emphasizes the importance of fulfilling basic needs before pursuing personal growth and self-fulfillment - Weaknesses: rigid hierarchy might not always be accurate; needs can overlap and be pursued simultaneously
Alderfer's ERG theory	Developed by Clayton Alderfer, this theory builds on Maslow's but proposes three core needs that can be satisfied in various ways	1. Existence (basic needs) 2. Relatedness (social connection) 3. Growth (self-development)	- It suggests that individuals can pursue multiple needs simultaneously and that frustration in one need can lead to the desire for satisfaction in another - It recognizes that individuals may regress to lower-level needs if higher-level needs are unsatisfied - Emphasizes the importance of social connection - Weaknesses: Less well known than Maslow's theory, the three categories are broader and less specific. But its Strengths: More flexible than Maslow's hierarchy, it acknowledges the possibility of regressing to lower needs if higher needs are unmet
McClelland's acquired needs theory	Developed by David McClelland, this theory focuses on three core acquired needs	1. Achievement 2. Power 3. Affiliation	- The theory proposes that individuals vary in the strength of these needs, and the dominant need drives their behavior. Achievement-oriented individuals seek personal accomplishment, affiliation-oriented individuals prioritize social relationships, and power-oriented individuals strive for influence and control - Focuses on individual differences in needs - Ignores basic physiological and safety needs. focuses on psychological needs - McClelland believed these needs are learned through experiences and cultural influences, and they can vary in strength between individuals
Self-determination theory (SDT)	Developed by Edward Deci and Richard Ryan, SDT focuses on three psychological needs:	1. Autonomy (independence) 2. Competence (mastery) 3. Relatedness (connection)	SDT suggests that individuals are driven by the desire to feel autonomous, competent, and connected to others. It highlights the importance of supporting individuals' intrinsic motivation and fostering a sense of autonomy to promote well-being and optimal functioning
Max-Neef Theory (Max-Neef, 1992)	Max-Neef proposes nine fundamental needs that are universal and constant across cultures and time. These needs can be satisfied in various ways (Wisting, 2017; Brand-Correa et al., 2018)	1. Subsistence 2. Protection 3. Affection 4. Understanding 5. Participation 6. Leisure 7. Creativity 8. Identity 9. Freedom	- Max-Neef's theory emphasizes that needs are interrelated and can be satisfied in various ways. and must be addressed holistically - It emphasizes the importance of meeting basic material needs while recognizing the significance of psychological, social, and existential needs - Max-Neef's theory provides a comprehensive framework for understanding human needs and their complex interplay
Costanza's theory	Costanza's theory expands the concept of needs by incorporating objective and subjective well-being dimensions	Needs vs. desires	- Suggests that needs encompass material resources, social relationships, personal capabilities, and subjective experiences. It recognizes that well-being is a multifaceted construct influenced by a range of factors beyond material possessions - Focuses on the distinction between basic needs for survival and desires influenced by culture and marketing - Critiques Maslow's inclusion of desires like esteem in the need's hierarchy - Argues that focusing on desires can lead to overconsumption and environmental damage
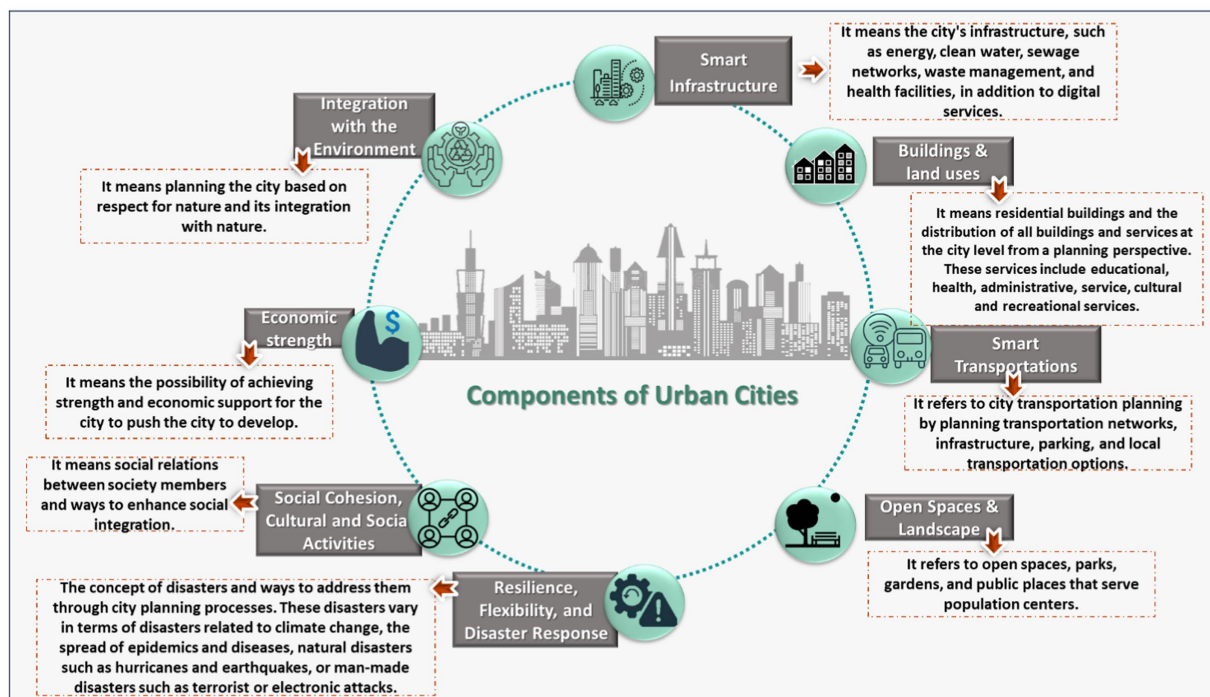
FIGURE 14
Concept of urban cities' components. Source: Author.

7 Results and discussion

The results of this study can be divided into two sections.

7.1 Results of bibliometric analysis

Through bibliometric analysis, the results showed:

- In recent years, there has been increasing interest in studying the relationship between urbanization and human needs, but the research output is insignificant. This indicates the worsening of the problem of neglecting human needs in the planning process due to changing modern urban trends and their neglect of this aspect. Consequently, there is a need for a system that integrates human needs into urban planning to address this issue. Studies focused on studying human needs from the perspective of human needs theories in psychology and sociology, such as Maslow's theory and Max Neve's theory, without determining their suitability to urban needs.
- Interest in this field and the study of human needs has increased in large cities such as China and the United States. Despite technological advancements, this indicates the impact of technology on urbanization in these countries and its neglect of human needs. The decline in studies of human needs and their relationship to urbanization in developing countries has been noted. When reviewing available studies, it was found that studies still did not reach the maturity level to comprehensively reach a concept of human needs, as they were limited to studying necessities such as housing and water.

- Analytical research studies found that the concept of human needs represents a change over time and that human needs differ as time passes. No study completely agrees with the other in terms of the urban needs that should be provided. This indicates the necessity of considering flexibility in determining needs. Where the city is an integrated system; therefore, a comprehensive study of its needs and the presence of an integrated approach that represents the system of human needs in urbanization are essential.

7.2 Creating a new theory of urban human needs

Many theories of human needs address human needs in different ways and with different indicators, as shown in Table 3. Despite the multiplicity of theories of human needs, previous studies relied in their studies on only two theories: (Maslow's Hierarchy of Needs and Max Neef's Theory), as shown in Table 2. While ignoring the shortcomings of these theories and their suitability for measuring human needs at the city level.

To make up for these shortcomings, UHN's theory was based on adopting Max Neef's theory and integrating it with previous theories within the framework of human needs in cities.

The concept of Max Neef's theory was adopted, which is based on the integration and interaction between needs and the interconnection between them, and then its nine elements were developed to cover all aspects of human needs at the level of cities, based on an analysis of the human needs that were addressed and focus on context, dynamic needs, integration with other theories, and an analysis of the concept
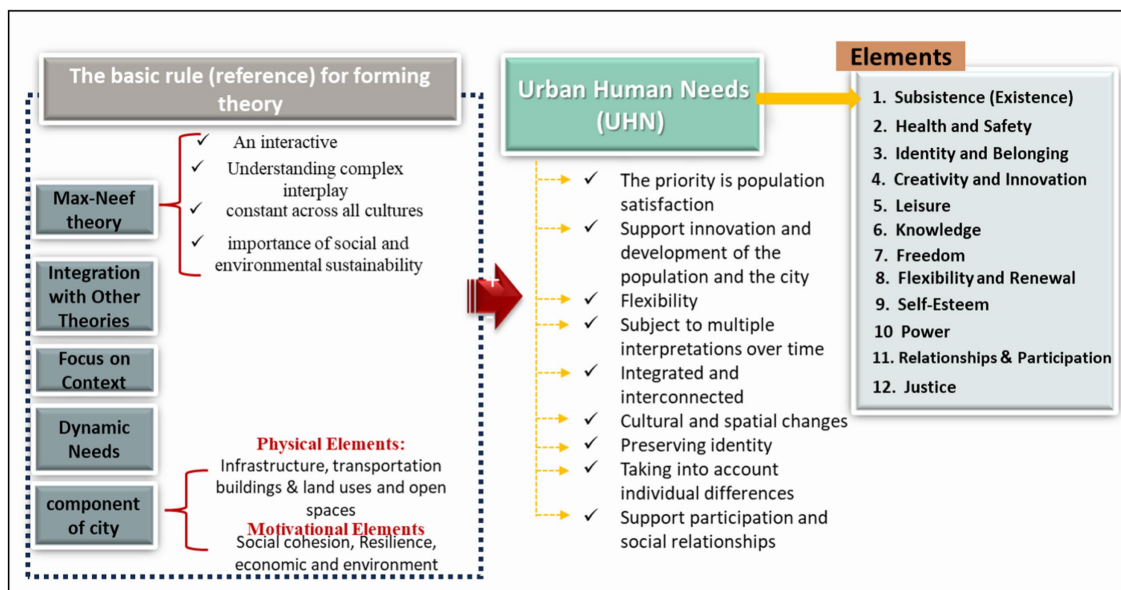
FIGURE 15
The process of developing the human needs theories to create urban human needs (UHN).

of each component of city construction, in order to create a theory. It addresses human needs more comprehensively.

7.3 Feedback between the new theory and the components of the urban city

As shown in Figure 17, The city is an interaction between humans and the built environment within a specific environment. This research focuses on studying humans through their needs and the possibility of meeting them through the elements of the built environment. The relationship between human needs and the city is reciprocal, as human needs must be fulfilled through all elements of the city to have a decent and comfortable life. There must be good urban planning that fulfills all human needs through the components of the city to obtain an ideal layout that meets the needs of its users.

Illustrating the concept of feedback between the human needs of the city and the components of the city is what Figure 17 accomplishes. The UHN was attained by delving into theories of human needs in psychology and the components of urbanization. When this theory is applied to urbanization, it generates indicators and methodologies aimed at realizing the theory on the ground. Consequently, a feedback process is initiated through urbanization on the theory of urban human needs, working toward enhancing and refining the theory. For example, the application of urban human needs can be linked to the various components of urbanization in public spaces. Designing parks and plazas in a manner that promotes interaction and learning is essential, whether through workshops, community gardens, or public art displays. Creating spaces that facilitate diverse cultural expressions, such as street performances or ethnic festivals, plays a crucial role in fostering a sense of belonging and identity. This can be aligned with the SDT principles focusing on autonomy, competence, and relatedness. Within urban infrastructure, it is imperative to implement reliable and accessible public transportation systems to enhance independence and

freedom of movement. Investing in skill-building programs and providing co-working spaces can empower residents to develop their competencies and work toward entrepreneurial endeavors. Moreover, facilitating community events and activities that promote interaction and social connections is vital, drawing from insights of both theories and focusing on housing. Developing mixed-use communities with various housing options is essential to cater to diverse needs and income levels, ultimately fostering a sense of belonging. Promoting resident involvement in neighborhood planning and design processes can increase autonomy and instill a sense of ownership over the urban environment. Leveraging technology for needs fulfillment, such as using online learning platforms for "Understanding" or civic engagement apps for "Participation," can be a valuable strategy. Creating a diverse and accessible job market is crucial in providing residents with opportunities to fulfill their needs for "Subsistence" and potentially "Power" through economic success. Designing cities with a focus on environmental sustainability can promote healthy lifestyles and minimize environmental impact, thereby addressing the need for "Health" and potentially "Transcendence" through a connection with nature. By strategically applying these principles to various aspects of urbanization, cities can evolve into more supportive environments that cater comprehensively to the diverse needs of their residents, thereby promoting well-being and fostering a stronger sense of community.

UHN is a framework that clarifies the human needs that need to be achieved and links them to the urban components to create an integrated urbanization that fulfills the desires of the population. The research presented a general framework to guide planners to plan cities according to human needs (i.e., cities for humans) within the framework of future trends to suit the changes created, these needs were represented through a general framework representing 12 needs that are interactive and interconnected with each other, and it is necessary to strive to cover these needs as much as possible through the components of city construction.

Concepts of urban human needs. Source: Author.
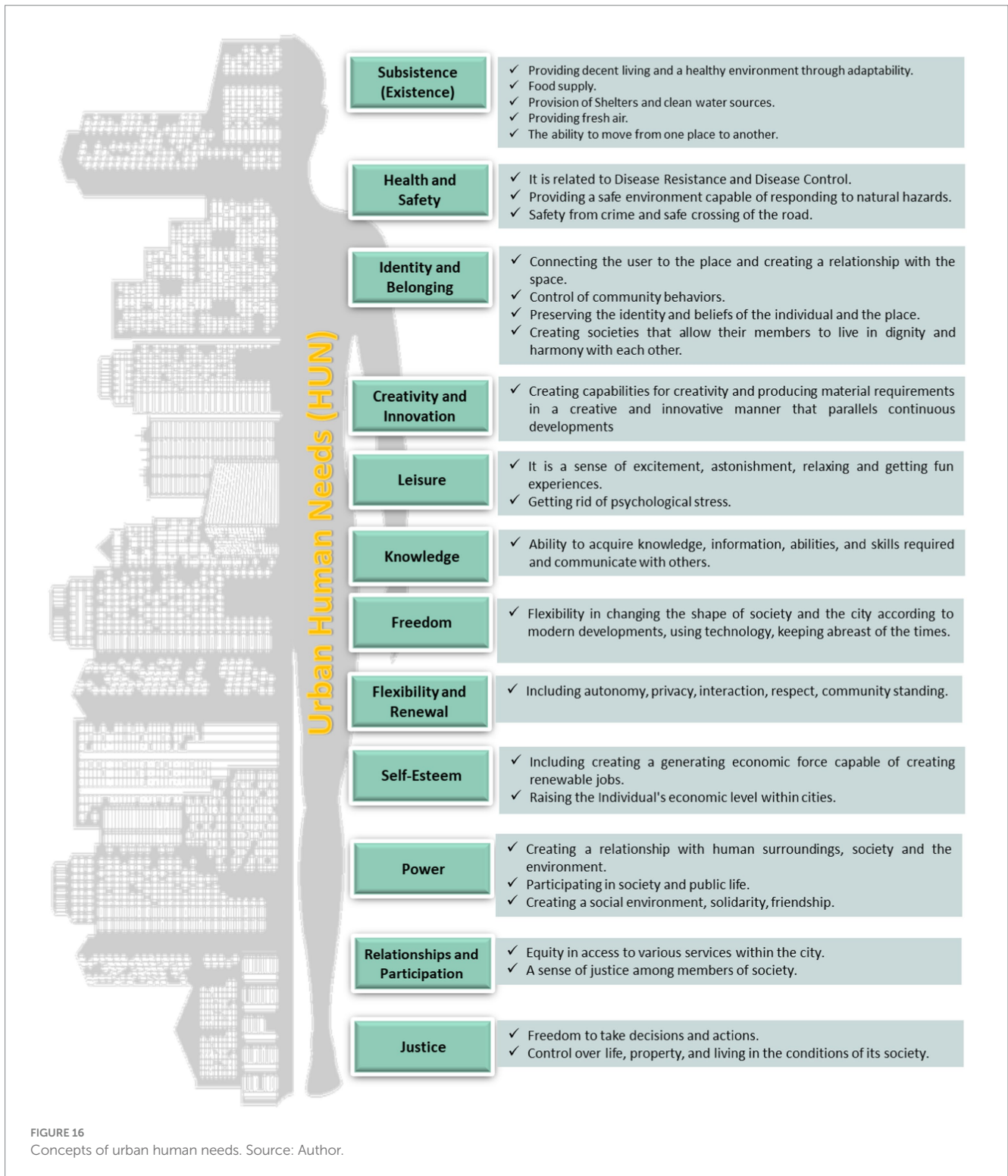
Based on the previous analysis of the bibliometric analysis and a comprehensive review of various configuration parameters related to human needs and urban cities, researchers have shown a growing interest in the correlation between urbanization and human needs, but the research output is minimal, highlighting the neglect of human needs in planning due to modern urban trends. An integrated system is necessary to incorporate human needs into urban planning to tackle this issue. Studies have concentrated on human needs theories, especially in major cities like China and the United States. Despite technological advancements, there is a lack of focus on human needs in urbanization. Analytical research reveals that human needs evolve and vary among studies, emphasizing the need for flexibility in determining needs. Given that a city is a complex system, a thorough examination of its needs
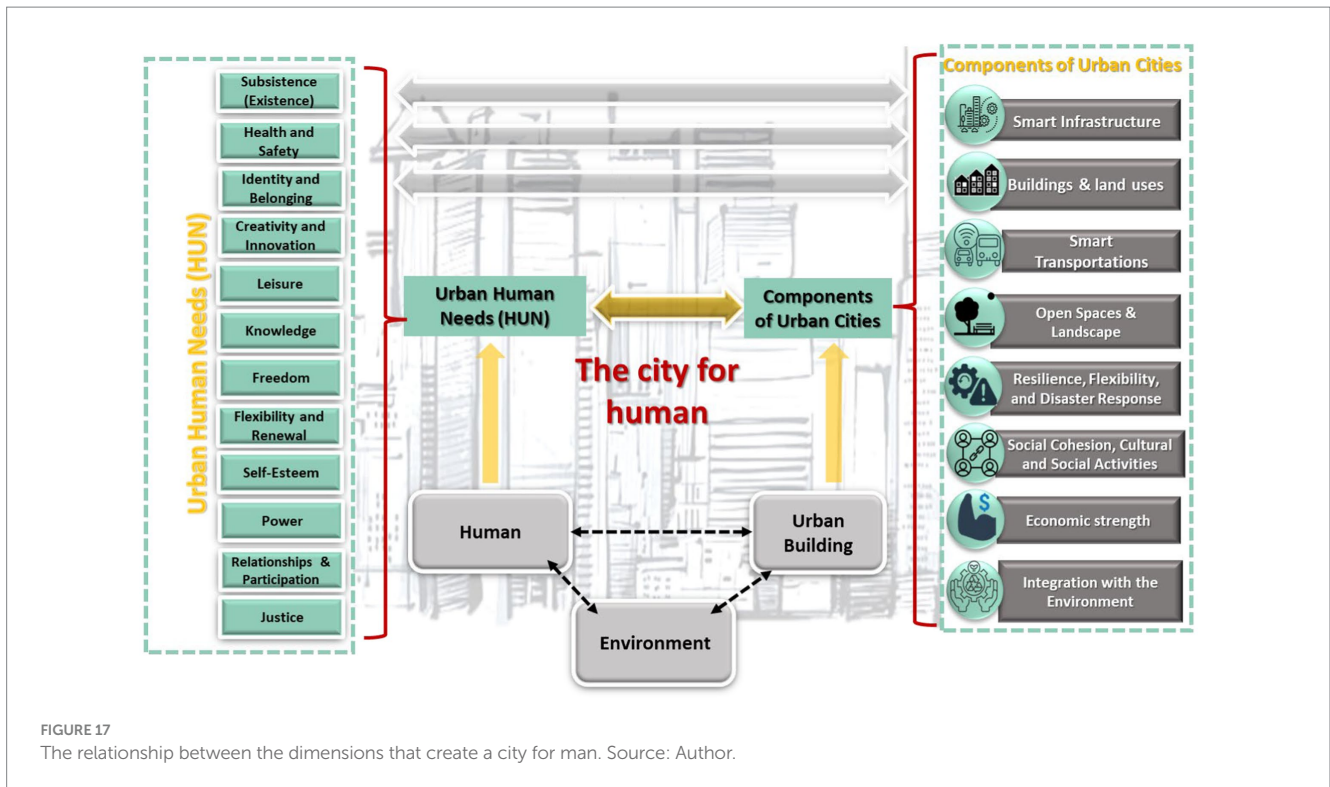
FIGURE 17
The relationship between the dimensions that create a city for man. Source: Author.

and an integrated approach to human needs in urbanization are crucial.

This framework subsequently necessitates an in-depth examination of the methodology to fulfill these requirements by considering each element individually.

In the end, this framework aims at:

- Covering all human needs through all elements of cities, aiming to improve the quality of urban life and achieve satisfaction from the population.
- It is considered a systematic thought to achieve future sustainability within the frameworks of smart cities and adapt them to serve humanity and not vice versa.
- This framework is primarily directed at serving people and achieving their desires. It is considered a future gateway to humanizing future smart cities.

Regarding the limitations, numerous potential restrictions must be taken into account. Primarily, the development of the database, a pivotal phase, laid the groundwork for this particular examination. On 22 December 2023, an exploration was carried out utilizing a restricted set of keywords within narrowly defined groupings, yielding specialized outcomes that lacked generalizability. Furthermore, a substantial quantity of literature was omitted from this study through the Scopus database, employing three criteria: categories, publication types, and language; or through manual scrutiny aligned with the aims and extent of the micro level, and the appropriateness of retaining articles relevant to the research subject.

This study strengthened the possibility of achieving human needs by formulating a new concept specializing in physical needs. This gives urban planners and designers an opportunity to be guided in city planning and can be developed by researchers through applied studies on cities.

8 Conclusion

Humanizing cities is a way to achieve human needs through urbanization and create integrated urbanism. The research focused on the human angle by focusing on his needs, meeting them, and linking them to the elements of urbanization through several steps: using bibliometric analysis (Biblioshiny and VOSviewer) and finding the extent of researchers' interest in this field and its impact. Then addressing the research gap in previous studies and highlighting the importance of integrating human needs into urbanization plans. Then criticize the theories of human needs in psychology, develop Max Neef's theory of human needs, and generate urban human needs (UHN). And prove that these needs are interrelated and must be fulfilled according to their importance, without dispensing with one of them, to achieve human balance. It then presents a framework that presents the human needs that must be fulfilled through urbanization.

The importance of this research lies in the fact that it represents a preliminary stage that draws a vision of future human needs at the level of urbanization and a basis on which future urban planning can be based. This research opens new horizons to study how to achieve HUN human needs through urban elements and create indicators and criteria that measure the extent to which human needs are achieved, which provides the key to developing and building more humane cities capable of understanding human needs in the cities in the future.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

SSA: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Funding

Conflict of interest

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

References

Abubakar, A. (2022). Towards a human-centred approach for enhancing place prosperity: defining and operating within the basic human needs. *Open House Int.* 47, 190–206. doi: 10.1108/OHI-12-2020-0171

Aktaş, N. K., and Dönmez, N. Y. (2021). An urban paradox: urban resilience or human needs *Design of Cities and Buildings: Sustainability and Resilience in the Built Environment*, 173.

Aliyeva, Z., Assipova, Z., Bazarbekova, M., Mussagaliyeva, A., and Sansyzbayeva, A. (2019). Urban area planning and environment in Kazakhstan's cities: case of Almaty. *Int. Multidiscip. Sci. GeoConference Surv. Geol. Min. Ecol. Manag.* 19, 775–782. doi: 10.5593/sgem2019/5.2/S20.097

Alperyte, I. (2006). Cultural needs of Lithuanian inhabitants in the context of global consumer culture. *Transform. Bus. Econ.* 5, 122–135.

Anderson, J. (2003). The environmental benefits of water recycling and reuse. *Water Sci. Technol. Water Supply* 3, 1–10. doi: 10.2166/ws.2003.0041

Arof, K. Z. M., Ismail, S., Najib, N. H., Amat, R. C., and Ahmad, N. H. B. (2020a). Exploring opportunities of adopting biophilic cities concept into mixed-use development project in Malaysia. *IOP Conf. Ser. Earth Environ. Sci.* 409:012054. doi: 10.1088/1755-1315/409/1/012054

Arof, K. Z. M., Ismail, S., Subramaniam, C., Azman, S., Rani, W. N. M. W. M., and Zolkepli, M. F. (2020b). Critical strategies for construction players in the adoption of biophilic city concept in Malaysia. *Plan. Malays.* 18, 181–192. doi: 10.21837/pm.v18i11.719

Aronson, M. F. J., Lepczyk, C. A., Evans, K. L., Goddard, M. A., Lerman, S. B., MacIvor, J. S., et al. (2017). Biodiversity in the city: key challenges for urban green space management. *Front. Ecol. Environ.* 15, 189–196. doi: 10.1002/fee.1480

Beck, M. B., and Villarroel Walker, R. (2013). Nexus security: governance, innovation and the resilient city. *Front. Environ. Sci. Eng.* 7, 640–657. doi: 10.1007/s11783-013-0549-5

Bibri, S. E., and Krogstie, J. (2019). Generating a vision for smart sustainable cities of the future: a scholarly backcasting approach. *Eur. J. Futures Res.* 7:5. doi: 10.1186/s40309-019-0157-0

Brand-Correa, L. I., Martin-Ortega, J., and Steinberger, J. K. (2018). Human scale energy services: untangling a 'golden thread'. *Energy Res. Soc. Sci.* 38, 178–187. doi: 10.1016/j.erss.2018.01.008

Bris, A. (2019). *Smart cities: world's best don't just adopt new technology, they make it work for people.* Available at: https://theconversation.com/smart-cities-worlds-best-dont-just-adopt-new-technology-they-make-it-work-for-people-124939#. (Accessed 30 October, 2020)

Bunkse, E. V. (1979). The role of a humane environment in Soviet urban planning. *Geogr. Rev.* 69, 379–394. doi: 10.2307/214802

Caprotti, F. (2018). Future cities: moving from technical to human needs. *Palgrave Commun.* 4:35. doi: 10.1057/s41599-018-0089-5

Cardoso, R., Sobhani, A., and Meijers, E. (2022). The cities we need: towards an urbanism guided by human needs satisfaction. *Urban Stud.* 59, 2638–2659. doi: 10.1177/00420980211045571

Çelikkay, H. S. (2020). "Empathic design approach to public space organization in the urban environment" in *Theory and practice in sustainable planning and design.*

Chiesura, A. (2004). The role of urban parks for the sustainable city. *Landsc. Urban Plan.* 68, 129–138. doi: 10.1016/j.landurbplan.2003.08.003

Coyle, S., and Duany, A. (2011). *Sustainable and resilient communities: a comprehensive action plan for towns, cities, and regions.*

Cuesta, R., Sarris, C., Signoretta, P., and Moughtin, J. C. (1990). *Urban design: method and techniques.*

Danesh, H. B. (2012). *Human needs theory, conflict, and peace.*

Dempsey, N., Brown, C., Raman, S., Porta, S., Jenks, M., Jones, C., et al. (2008). *Elements of urban form*, 21–51.

Dietrich, U. (2021). Space needed to make a city sustainable and necessary changes to reach it: the case of Germany. *WIT Trans. Ecol. Environ.* 253, 229–240. doi: 10.2495/SC210201

Doyal, L., and Gough, I. (1991). A theory of human need. *Crit. Soc. Policy* 4, 6–38. doi: 10.1177/026101838400401002

Drakakis-Smith, D. (1997). Third world cities: sustainable urban development IIIÐ basic needs and human rights. *Urban Stud.* 34, 797–823. doi: 10.1080/0042098975835

Fun, S. L., Christiaanse, K., Cairns, S., Richthofen, A. V., Leyk, D., Knecht, K., et al. (2018). *Urban Elements: Advanced Studies in Urban Design*. Zürich, Switzerland: ETH Zürich, Department of Architecture.

Fan, C., Xu, J., Natarajan, B. Y., and Mostafavi, A. (2023). Interpretable machine learning learns complex interactions of urban features to understand socio-economic inequality. *Comput. Aided Civ. Inf. Eng.* 38, 2013–2029. doi: 10.1111/mice.12972

Fan, L., and Zhang, D. (2023). Study on the hotspots of urban tourism spaces based on Instagram-worthy locations data: taking Beijing as an example. *Environ. Plan. B* 50, 1822–1837. doi: 10.1177/23998083221146542

Forsyth, A. (2014). The urban design handbook: techniques and working methods (2nd ed.), by Urban Design Associates. *J. Am. Plan. Assoc.* 80, 448–449. doi: 10.1080/01944363.2014.998135

Gibbs, D., Krueger, R., and MacLeod, G. (2013). Grappling with smart city politics in an era of market triumphalism. *Urban Stud.* 50, 2151–2157. doi: 10.1177/0042098013491165

Gimelli, F. M., Rogers, B. C., and Bos, J. J. (2019). Linking water services and human well-being through the fundamental human needs framework: the case of India. *Water Altern.* 12, 715–733.

González-Méndez, M., Olaya, C., Fasolino, I., Grimaldi, M., and Obregón, N. (2021). Agent-based modeling for urban development planning based on human needs. Conceptual basis and model formulation. *Land Use Policy* 101:105110. doi: 10.1016/j.landusepol.2020.105110

Greenbie, B. B. (1978). A model for accommodating the human need for small scale communities within the context of global cooperative systems. *Urban Ecol.* 3, 137–153. doi: 10.1016/0304-4009(78)90004-9

Greene, S. (1992). City shape: communicating and evaluating community design. *J. Am. Plan. Assoc.* 58, 177–189. doi: 10.1080/01944369208975792

Gu, X., Xu, D., Xu, M., and Zhang, Z. (2022). Measuring residents' perceptions of multifunctional land use in peri-urban areas of three Chinese megacities: suggestions for governance from a demand perspective. *Cities* 126:103703. doi: 10.1016/j.cities.2022.103703

Guillen-Royo, M., Guardiola, J., and Garcia-Quero, F. (2017). Sustainable development in times of economic crisis: a needs-based illustration from Granada (Spain). *J. Clean. Prod.* 150, 267–276. doi: 10.1016/j.jclepro.2017.03.008

Hallsmith, G. (2003). *The key to sustainable cities: meeting human needs, transforming community systems*. Gabriola Island: New Society Publishers.

Howard, E., Burgess, E. W., Corbusier, L., Mumford, L., Jacobs, J., Wirth, L., et al. (2016). *The City Reader*. 6th Edn.

Hurly, J., and Walker, G. J. (2019). Nature in our lives: examining the human need for nature relatedness as a basic psychological need. *J. Leis. Res.* 50, 290–310. doi: 10.1080/00222216.2019.1578939

Illia Ibrahim, F., and Diyana Nizarudin, N. (2019). Human interaction theory for sustainable city. *IOP Conf. Ser. Earth Environ. Sci.* 268:012046. doi: 10.1088/1755-1315/268/1/012046

Jansson, T. (2013). Reaching for a sustainable, resilient urban future using the lens of ecosystem services. *Ecol. Econ.* 86, 285–291. doi: 10.1016/j.ecolecon.2012.06.013

Ji, T., Chen, J.-H., Wei, H.-H., and Su, Y.-C. (2021). Towards people-centric smart city development: investigating the citizens' preferences and perceptions about smart-city services in Taiwan. *Sustain. Cities Soc.* 67:102691. doi: 10.1016/j.scs.2020.102691

Kochtitzky, C. S., Frumkin, H., Rodriguez, R., Dannenberg, A. L., Rayman, J., Rose, K., et al. (2006). Urban planning and public health at CDC. *MMWR Morb. Mortal Wkly. Rep.* 55, 34–38.

Krisztián Nagy, D. (2022). Hinterlands, city formation and growth: evidence from the U.S. westward expansion. *Rev. Econ. Stud.* 90, 3238–3281. doi: 10.1093/restud/rdad008

Lam, S., Li, H., and Yu, A. T. W. (2021). A demand-side approach for linking the past to future urban-rural development. *Urban Plan.* 6, 162–174. doi: 10.17645/up.v6i2.3798

Liu, L., and Tan, S.-K. (2010). Functional analysis of the land-use system in urban residential areas. 2010 International Conference on E-Business and E-Government, 5191–5194

Lowe, M. D. (1991). *Shaping cities: the environmental and human dimensions*

Luckan, Y. (2021). "Defining the layers of urban complexity: an epistemological shift towards inclusive cities" in *Urban inclusivity in southern Africa: the urban book series*.

Maclean, A. (1983). "Human need and community initiatives in an urban setting" in *Canterbury at the crossroads*.

March, H., and Ribera-Fumaz, R. (2016). Smart contradictions: the politics of making Barcelona a self-sufficient city. *Eur. Urban Reg. Stud.* 23, 816–830. doi: 10.1177/0969776414554488

Marvi, L. T., Behzadfar, M., and Shemirani, S. M. M. (2023). Defining the social-sustainable framework for smart cities. *Int. J. Hum. Cap. Urban Manag.* 8, 95–110. doi: 10.22034/IJHCUM.2023.01.08

Max-Neef, M. (1991). *Human scale development: conception, application and further reflections*. New York and London: The Apex Press.

Max-Neef, M. (1992). "Development and human needs" in *Real-life economics: understanding wealth creation* (London: Routledge), 197–213.

McKenzieb, D., and Raya, I. (2009). Urban water supply in India: status, reform options and possible lessons. *Water Policy* 11, 442–460. doi: 10.2166/wp.2009.056

Mutică, A. P. (2013). "Architecture and human needs" in *Acta technica napocensis: civil engineering & architecture*.

Neufeld, C., and Wohl, S. (2022). "Experiments in living together" in *Future urban habitation: transdisciplinary perspectives, conceptions, and designs*.

Palmer, H., Simon, D., and Riise, J. (2022). Urban research for sustainability: developing a comparative transdisciplinary co-production approach to realise just cities. *Int. J. Sustain. Dev.* 25, 78–94. doi: 10.1504/ijsd.2022.126473

Papachristou, I. A., and Rosas-Casals, M. (2019). Maximising the degree of user choice: a simple tool to measure current levels of quality of life in urban environments. *Urban Plan.* 4, 207–222. doi: 10.17645/up.v4i2.2006

Peng, J., Liu, Y., Wu, J., Lv, H., and Hu, X. (2015). Linking ecosystem services and landscape patterns to assess urban ecosystem health: a case study in Shenzhen City, China. *Landsc. Urban Plan.* 143, 56–68. doi: 10.1016/j.landurbplan.2015.06.007

Rodrigues, J. P. C. (2018). Local government aimed at quality of life in sustainable cities *Entrepreneurial, Innovative and Sustainable Ecosystems. Applying Quality of Life Research*. Springer, Cham 35–53)

Rodzoś, J. (2019). The concept of human needs in sustainable development of cities | Teoria potrzeb ludzkich w rozwoju zrównoważonym miast. *Problemy Ekorozwoju* 14, 91–99.

Rossi, U. (2016). The variegated economics and the potential politics of the smart city. *Territ., Politics, Gov.* 4, 337–353. doi: 10.1080/21622671.2015.1036913

Saloma, C., and Akpedonu, E. (2021). Parks, plans, and human needs: Metro Manila's unrealised urban plans and accidental public green spaces. *Int. J. Urban Sustain. Dev.* 13, 715–727. doi: 10.1080/19463138.2021.2021418

Santoni, , Siahaan, U., and Tobing, R. R. (2023). Relocating illegal urban settlements and fulfilling the human needs through physical order: an evaluation of the Marunda flats in Jakarta, Indonesia. *ISVS E-J.* 10, 56–75.

Santos, L. D., and Martins, I. (2007). Monitoring urban quality of life: the porto experience. *Soc. Indic. Res.* 80, 411–425. doi: 10.1007/s11205-006-0002-2

Seliverstov, S., Seliverstov, Y., Gavkalyk, B., and Fahmi, S. (2020). Development of transport infrastructure organization model for modern cities with growing effectiveness. *Transp. Res. Procedia* 50, 614–625. doi: 10.1016/j.trpro.2020.10.073

Sheikh, W. T., and van Ameijde, J. (2022). Promoting livability through urban planning: a comprehensive framework based on the "theory of human needs". *Cities* 131:103972. doi: 10.1016/j.cities.2022.103972

Shrestha, S. B., and Taniguchi, O. (2003). A holistic approach for providing affordable housing to the urban poor of Nepal. *J. Asian Archit. Build. Eng.* 2, 153–160. doi: 10.3130/jaabe.2.153

Su, M., Fath, B. D., and Yang, Z. (2010). Urban ecosystem health assessment: a review. *Sci. Total Environ.* 408, 2425–2434. doi: 10.1016/j.scitotenv.2010.03.009

Tay, L., and Diener, E. (2011). Needs and subjective well-being around the world. *J. Pers. Soc. Psychol.* 101, 354–365. doi: 10.1037/a0023779

Thompson, C. W. (2002). Urban open space in the 21st century. *Landsc. Urban Plan.* 60, 59–72. doi: 10.1016/S0169-2046(02)00059-2

Tweed, C., and Sutherland, M. (2007). Built cultural heritage and sustainable urban development. *Landsc. Urban Plan.* 83, 62–69. doi: 10.1016/j.landurbplan.2007.05.008

Venables, A. J. (2007). *The dynamics of city formation: finance and governance*. Available at: http://www.econ.brown.edu/faculty/henderson/

Wang, J., Hu, Y., Song, R., and Wang, W. (2022). Research on the optimal allocation of ecological land from the perspective of human needs—taking Hechi city, Guangxi as an example. *Int. J. Environ. Res. Public Health* 19:12418. doi: 10.3390/ijerph191912418

Wisting, C. (2017). "Managing urban development based on human wellbeing" in *Master's Thesis*.

Wong, T.-C., Han, S. S., and Zhang, H. (2015). *Population mobility, urban planning and management in China*.

Ye, K., Luo, H., Zhong, H., and Kang, J. (2022). Physiological and psychological influence of multi-media in urban business districts. *Sustain. Cities Soc.* 77:103546. doi: 10.1016/j.scs.2021.103546

Zeng, W., Huo, X., and Yu, Z. (2020). Humanistic demand and spatiotemporal perspective in the evaluation of urban life quality—a case study of Shandong province in China. *IOP Conf. Ser. Earth Environ. Sci.* 580:012065. doi: 10.1088/1755-1315/580/1/012065

Zhang, H., Cheng, C., and Miao, S. (2019). A precise urban component management method based on the GeoSot grid code and BIM. *ISPRS Int. J. Geo Inf.* 8:159. doi: 10.3390/ijgi8030159

Zwierzchowska, I., Hof, A., Iojă, I.-C., Mueller, C., Poniży, L., Breuste, J., et al. (2018). Multi-scale assessment of cultural ecosystem services of parks in central European cities. *Urban For. Urban Green.* 30, 84–97. doi: 10.1016/j.ufug.2017.12.017