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TOWARDS A COMMON UNDERSTANDING OF URBAN SUSTAINABILITY

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Abstract. Although the term "urban sustainability" has gained worldwide popularity in the past few decades, there is still no common understanding of its definition. The purpose of this paper is to provide a comprehensive analysis of the "urban" and "urban sustainability" terms by synthesizing the existing definitions and proposing a new term through a review of relevant literature, research and definition. In this study, the authors discuss numerous facets of urban sustainability, including environmental preservation, social equality, and economic growth. A comprehensive bibliometric analysis and systematic literature review are conducted to identify the meaning of the terms. It is concluded that urban sustainability can be defined as a state in which major subsystems of a city (economical, social, physical, and environmental) work in harmony to ensure the long-term well-being of its inhabitants and the preservation of natural resources on which the city's growth and prosperity rely.

Keywords: sustainability, urban sustainability, sustainable urban development, definition of "urban sustainability".

JEL Classification: Q5, P25.

Introduction

Since urbanisation has been accelerating globally and more than half of humanity now lives in cities, urban sustainability has become a crucial idea in the twenty-first century (United Nations, 2018). Although the word "sustainability" has many different meanings, in general, it refers to a system's potential to endure over time without jeopardising its ability to meet the demands of the future. Urban sustainability, then, is the ability of cities to meet the requirements of their citizens now and in the future while maintaining the long-term resilience and health of the urban ecosystem (Newman & Jennings, 2008).

Urban sustainability has changed over time, and numerous academics and organisations have offered varying interpretations of what it comprises (Bulkeley et al., 2014; Burchell et al., 2002; Friedmann, 2014; United Nations Development Programme [UNDP], 2016). Although others place more emphasis on social and economic sustainability, some emphasise the significance of environmental sustainability (Brenner et al., 2012; Sassen, 2013; Satterthwaite, 2013). Yet, there is growing agreement that urban sustainability should be viewed as an integrated concept that incorporates the three sustainability pillars (environmental, social, and economic) (Grimm et al., 2008; McPhearson et al., 2016; Pickett et al., 2008).

In this paper, the definitions of "urban sustainability" and "sustainable urban development" are critically analysed, and a clear and concise definition for each term is proposed. To achieve this, a comprehensive literature review, employing the PRISMA approach to systematically review is conducted, and the existing definitions in the field are analysed. In addition, the difference between the terms "sustainability" and "sustainable development" is discussed, while their implications in the context of urban planning are explored.

The paper is structured as follows:

- Background: An overview of the rise in interest in urban sustainability and the challenges faced in defining this concept.
- Methodology: PRISMA approach was used to conduct a systematic literature review and the process of selecting and analysing relevant articles.
- Analysis of existing definitions: a critical analysis of the definitions of "urban sustainability" and "sustainable urban development" found in the literature, highlighting the similarities, differences, and potential issues.

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Proposed definitions: based on analysis, a clear and concise definition for "urban sustainability" and "sustainable urban development" is proposed. The authors seek to contribute to a more coherent understanding of "urban sustainability" and "sustainable urban development" and to facilitate more effective research and policymaking in the field of urban planning and development.

1. Literature review

Growing awareness of the limited nature of natural resources and the need to combine economic growth with environmental conservation led to the birth of the idea of sustainability. The 1980s saw the introduction of the idea of sustainable development as it became apparent that environmental protection and economic growth were not antagonistic ends in themselves (Golubiewski et al., 2019).

When urbanisation became a more significant engine of global economic growth, the idea of sustainable urban development emerged from the more general idea of sustainable development (Hassan et al., 2014). In 1976, Vancouver hosted the first Habitat I conference, which established the need for sustainable urban development and gave communities a forum to debate related concerns and exchange best practices (United Nations, 1976). The Habitat Agenda was agreed upon at the second United Nations Conference on Human Settlements (Habitat II), which was held in Istanbul in 1996, and it provided a thorough framework for sustainable urban development (United Nations, 1996).

Since then, the idea of sustainable urban development has developed further, with an increasing focus on the necessity of striking a balance between economic growth, environmental conservation, and social fairness (Montoya et al., 2019). Urban-related objectives, such as SDG 11: Sustainable Cities and Communities, are part of the comprehensive framework for sustainable development established by the United Nations in 2015 (UNDP, 2016).

Urban sustainability is a multifaceted idea that includes a variety of elements that improve urban communities' quality of life. Sustainability on three main fronts: environmental, social, and economic is widely emphasised in the literature.

The ability of a city to sustain its ecological resources over time, such as the quality of its air and water, its biodiversity, and its natural ecosystems, is known as environmental sustainability. Urban areas frequently experience pollution, deforestation, and other forms of environmental deterioration, which can have a substantial impact on the natural world. Because of this, fostering environmental sustainability necessitates a coordinated effort to safeguard and conserve natural resources, lessen pollution, and advance sustainable behaviours like waste reduction and renewable energy (Girardet, 2018).

Social sustainability aims to increase urban dwellers' quality of life while simultaneously making sure that the advantages of urban development are fairly distributed. This aspect of sustainability is fostering social cohesion, making living conditions safe and healthy, and making sure that the requirements of every member of society are met. Investment in affordable housing, increasing access to healthcare and education, and building accessible public places are all tactics for fostering social sustainability (Joss et al., 2019).

The ability of metropolitan regions to achieve economic growth and prosperity in a manner that is both environmentally and socially sustainable is referred to as economic sustainability. In order to minimise detrimental environmental and social repercussions, this aspect of sustainability necessitates striking a balance between the requirements of neighbourhood companies, investors, and residents. Supporting small companies and entrepreneurs in the community, putting money into environmentally friendly transportation infrastructure, and encouraging the expansion of environmentally friendly industries like green technology are all ways to promote economic sustainability (Baker et al., 2019).

Urban sustainability is a fast-developing idea, with a wide range of definitions and methods created throughout time. Urban sustainability is defined differently depending on the situation; however, there are several characteristics that are shared by many of the definitions that are now in use.

The Brundtland definition, which states that sustainable development is "development that fulfils the requirements of the present without compromising the ability of future generations to satisfy their own needs", is one of the most often used definitions of urban sustainability (Brundtland Commission, 1987). In order to ensure a sustainable future, this concept emphasises the significance of striking a balance between economic, social, and environmental concerns.

The "triple bottom line" idea, which highlights the significance of balancing economic, social, and environmental factors in urban development, is another popular approach to urban sustainability (Elkington, 1999). This method acknowledges that for urban growth to be truly sustainable, it must be economically viable, socially equitable, and environmentally sustainable.

A number of more modern concepts and frameworks have also been created to direct efforts to sustain urban areas. The Sustainable Development Goals (SDGs), for instance, offer a thorough framework for supporting sustainable development and include a particular aim focused on sustainable cities and communities (United Nations, 2015).

In a similar vein, the idea of the "circular economy" has drawn more and more attention in recent years as a possible framework for fostering sustainable urban growth. The circular economy strategy places a focus on how crucial it is to create goods, services, and systems that reduce waste and encourage resource efficiency (Ellen MacArthur Foundation, 2020).

Despite the variety of approaches to urban sustainability, a number of existing definitions and frameworks share some similar characteristics. The significance of encouraging social fairness and inclusivity in urban planning is one of these themes. This might involve addressing problems like poverty, inequality, and prejudice, as well as encouraging access to necessities like housing, healthcare, and education.

The necessity of promoting environmental sustainability in urban development is another recurring theme. This may entail initiatives to lower greenhouse gas emissions, support renewable energy sources, and safeguard natural resources like water and land. Likewise, there is a rising understanding of the significance of supporting natural ecosystems and biodiversity in urban settings (McPhearson et al., 2016).

The significance of fostering economic growth and job creation in a manner that is socially and environmentally sustainable is emphasised in many urban sustainability strategies. This may entail promoting sustainable sectors, assisting small enterprises in the community, and making investments in public utilities and infrastructure to foster long-term economic prosperity (Baker et al., 2019).

As a whole, the idea of urban sustainability involves a variety of distinct definitions and strategies, but there are some recurring characteristics that cut through many of the frameworks that are already in place. Cities can aim to provide healthy, prosperous, and sustainable living conditions for their citizens by fostering social fairness, environmental sustainability, and sustainable economic development.

2. Methodology

This study uses a systematic literature review together with the PRISMA approach for choosing and analysing pertinent publications in order to clarify the ambiguity around the words "urban sustainability" and "sustainable urban development". This methodology section describes the processes that were taken and the techniques that were employed to carry out the study.

A systematic literature review was conducted to gather a comprehensive collection of articles related to the terms "urban sustainability" and "sustainable urban development". The databases Web of Science (WOS) and Scopus were searched using keywords such as "urban sustainability", "sustainable urban development", and "definition". The search results were then compiled and screened for relevance, considering only articles published in English.

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach was employed to refine the literature selection and ensure a rigorous analysis. This method involves several stages: Identification- articles related to the keywords were identified in the databases; screening – titles and abstracts were screened to assess their relevance to the research topic; eligibility – full-text articles were obtained and evaluated for their suitability for inclusion in the study; inclusion the final set of articles was selected based on their relevance and the presence of a clear definition of "urban sustainability" or "sustainable urban development".

Using the PRISMA approach ensured that the study was conducted in a transparent and replicable manner, minimising potential biases and enhancing the reliability of the findings.

Once the final set of articles was selected, the definitions of "urban sustainability" and "sustainable urban development" provided by the authors were extracted and analysed. The analysis involved comparing and contrasting the different definitions to identify common themes, patterns, and discrepancies. This process allowed for the development of clear and concise definitions for each term, addressing the confusion and inconsistencies found in the literature.

3. Bibliometric analysis

First, let us look at the existing "urban sustainability" literature. To begin with "urban sustainability" was searched in Scopus and Web of Science (WOS) databases. In WOS there were 39,863 publications highlighting the key phrase "urban sustainability". As is seen in Figure 1, the majority of articles were published in the fields of Environmental Sciences, Green Sustainable Science Technology, Environmental Studies and Urban Studies.

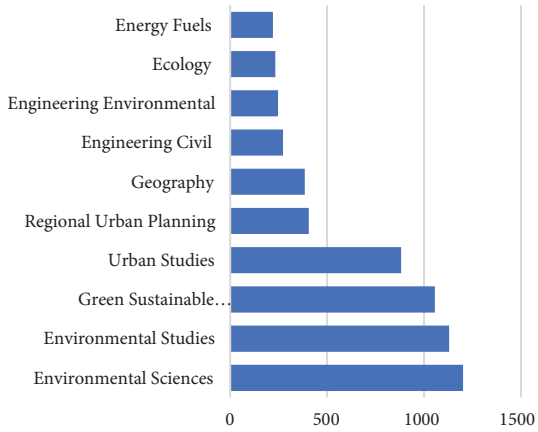

Figure 1. Number of "urban sustainability" related publications in different fields on WOS (source: created by the authors)

Meanwhile, in Scopus, the search for "urban sustainability" resulted in 30,020 documents. As it is shown in Figure 2, the first time, appearance of this keyword in a paper was as early as 1981, when only one paper was published, followed by a 4-year quiet period with no publications related to this topic. Over time, however, there was a steady increase in interest in this field and a rapid growth to nearly 4000 articles written in 2021 (Figure 2).

As was previously shown, there are many study articles on the subject of "urban sustainability" that are

available, but what does this term actually mean? The number of publications that are available substantially drops while attempting to define this notion.

Just 90 results for "urban sustainability" AND "definition" are retrieved from WOS, and 133 results are found in Scopus.

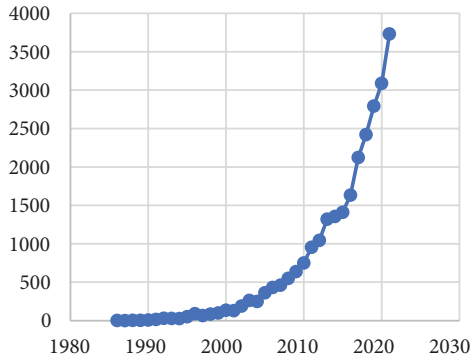

Figure 2. Number of documents on "urban sustainability" published in Scopus from 1980–2021 (source: created by the authors)

Despite the fact that "urban sustainability"-related materials initially started to appear in 1981, the definition of this idea was first introduced in 2004, according to Scopus. The number of papers that are supposed to provide the definition of this phrase experiences some significant changes and peaks in 2022 with 18 documents. The greatest number of documents providing the definition of urban sustainability was sponsored by the National science foundation, European Commission, Horizon 2020 Framework Program and Svenska Forskningsrådet Formas.

4. PRISMA review of the literature

Although "definition" was one of the searched keywords, the author's analysis of all the articles in the list revealed that the majority of the authors did not offer this definition in the selected papers. Therefore, the author used the PRISMA approach to search through all of these articles and other scientific sources to define "urban sustainability".

First, a search for the keywords "sustainable urban development" AND "definition" was carried out in the Scopus and WOS databases. Overall, 223 documents appeared in response to this search. 52 out of 223 documents were duplicated, and therefore one copy of each of the 52 duplicates was removed. 13 documents were written in languages other than English and thus also removed from the selection. After all these steps we had 158 documents left. Out of 158 documents full texts to 12 papers could not be found, leading to their exclusion from the final set of documents for analysis. Each document was then screened for the definition of "urban sustainability"; however, although all of these documents had "urban sustainability" among the keywords and used this term several times within papers, only 11 papers really contained the definition (Figure 3).

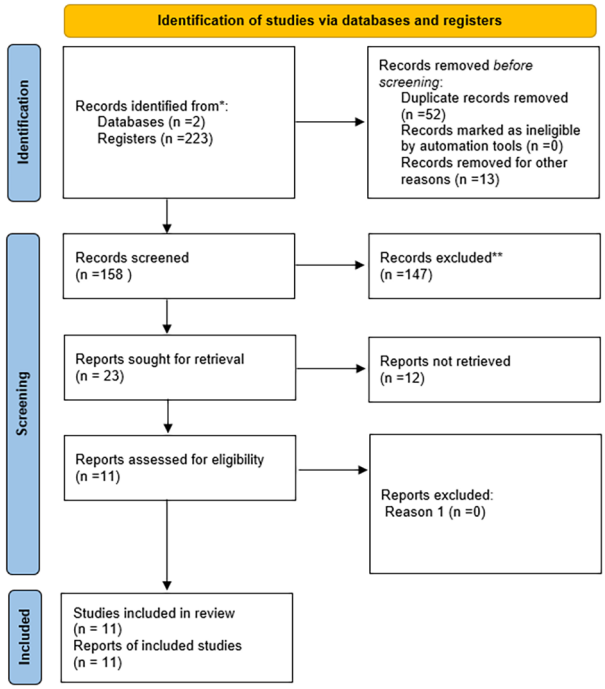

Figure 3. PRISMA for systematic literature review of the definition of urban sustainability (produced by the authors based on Page et al., 2021)

Let us examine the definition of urban sustainability provided by the authors of the chosen articles. You can find definitions suggested by the authors as well as references to the studies in Table 1.

As can be seen from Table 1, even in these 11 articles, many authors cite other writers' work rather than offering their own definition, and some explicitly assert that no such definition exists. In addition, despite the fact that urban sustainability is the keyword, other authors define it as sustainable urban development. This causes a great deal of confusion when trying to undertake research in this area. So, it may be inferred that the phrase "urban sustainability" needs to be defined explicitly right away.

Let's examine the concept of "sustainable urban development" first and talk about whether or not it can serve as a stand-in for "urban sustainability".

The ideas of sustainability and sustainable development are commonly related, according to the literature, and as a result, both terms are used interchangeably in academic and scientific contexts (Olawumi & Chan, 2018; Sartori et al., 2014). Yet, a number of schools of thought contend that sustainable development is a contradictory concept because its objectives are inconsistent and it is impossible to sustain endless economic growth on a finite planet (Redclift, 2005; Sachs, 1999). This position raises issues in social, political, economic, cultural, and environmental fields in addition to epistemological ones since it bases national and international environmental policies and initiatives on a convoluted or nebulous concept. This has led writers like José Naredo (2004) to issue dire warnings about the need to rethink sustainability in terms of a different concept (Kothari et al., 2014). This circumstance shows that both concepts are still debatable

and emphasises the need for a more thorough academic analysis of their definitions.

Many academics tend to agree on the definition of the sustainable development idea, notwithstanding occasional disagreements on this subject. Despite some debates around this topic, various scholars tend to agree about the definition of the sustainable development concept. Since its first appearance in the early 1970s, when various publications warned that the Western development model needed to be constrained (Mebratu, 1998; Mitlin, 1992); the cumulative evidence of the harmful effects on the environment of the agricultural green revolution (Carson, 1962); industrial pollution, including cases like the Seveso disaster and the Minamata disease (Bertazzi, 1991); and the Western way of life and urbanisation (Meadows et al., 1972), the concept went through a number of transformations. Finally, sustainable development was defined as one which satisfies existing demands without jeopardising the capacity of future generations to satisfy their own needs. Of course, different authors have varied viewpoints on this definition, but the essence of the idea is still the same.

So, what distinguishes sustainability from sustainable development? Despite the fact that these phrases are frequently used synonymously and have some comparable meanings, the second idea has stronger semantics because it is a process. As a result, sustainability is seen as a long-term goal, while sustainable development

Table 1. Definitions of "urban sustainability" from the selected via PRISMA method papers (source: produced by the authors)

Reference	Definition and key ideas
Ahvenniemi and Huovila (2020)	Here, the authors do not provide their own definition; instead, they refer to another author (Macke et al., 2019) who stated that the definition of urban sustainability is still vague.
Montoya et al. (2019)	Urban sustainability is the desirable state of urban conditions that endures throughout time. Additionally, the authors refer to Barton and Grant (2006) who claimed that urban sustainability is seen as a method that makes it possible to plan according to ideals that serve as a long-term "goal-objective" for developing cities; and Hiremath et al. (2013), according to whom the goal of urban sustainability is to strike a balance between environmental conservation and urban development that is also socially equitable in terms of things like income, employment, housing, and access to essential services. The authors conclude that urban sustainability is a balanced process involving four dimensions: economic, social, environmental, and the built environment.
Ojeda-Revah et al. (2020)	Here, again, the authors do not provide their own definition but refer to another paper in which urban sustainability is understood as "an adaptive process of facilitating and maintaining a virtuous cycle between ecosystem services and human well-being through concerted ecological, economic, and social actions in response to changes within and beyond the urban landscape" (Wu, 2014).
Camagni et al. (1998)	Urban sustainability logically refers to the three environments in two ways: (a) in a static sense, as maximisation of the net cross-externality effects of each of the three environments on the other two, both in the short and long terms; this entails avoiding negative interactions and trade-offs to the greatest extent possible and utilising all potentials for positive feedback effects; and (b) in a dynamic sense, as co-evolution of the three environments.
Camagni (2017)	In this paper the author does not provide a definition of urban sustainability; instead, it defines sustainable urban development, which according to him is a process of co-evolution and synergistic integration of the major systems that comprise a city (economic, social, physical, and environmental), which ensures long-term wellbeing for the local population without interfering with nearby areas' potential for development and, as a result, lessens the negative effects of development on the biosphere.
Toli and Murtagh (2020)	There isn't a single, widely accepted definition of sustainability at the urban level. Nevertheless, there is a collection of urban sustainability traits that are frequently used. Intergenerational equity, intragenerational equity (social, geographic, and governance equity), environmental preservation, significantly reduced use of non-renewable resources, economic vitality and diversity, local autonomy, citizen well-being, and satisfaction of basic human needs are a few of these.
Hassan et al. (2014)	Urban sustainability reflects the optimal conditions that continue to exist within the urban area, whereas sustainable urban development refers to the creation of sustainable urban areas. The two concepts are closely related and are frequently used interchangeably. Sustainable urban development, on the other hand, refers to the policies and procedures that advance sustainability.
Lorr (2012)	Urban sustainability means making dense urban life appealing and liveable while staying within set development or growth boundaries.
Shen et al. (2011)	Urban sustainability can be considered a measure to determine how far a city has progressed toward a desired level of sustainability. This condition is defined as a practice that makes efficient use of resources, enhances life quality in a wonderful environment while remaining constrained by the physical limits of our planet.
Shen et al. (2013)	The essential value of urban sustainability always resides in the balance of environmental, economic, and social growth, despite the fact that there are many distinct definitions of urban sustainability given by various communities in various locations about their own unique problems.
Wu (2014)	Urban sustainability may refer to a set of dynamic conditions that meet the demands of the present and future generations in a city, but its true essence lies in the constant adaptive process of creating and upholding those conditions.

describes the numerous strategies and pathways used to get there. In other words, sustainability is the end objective, whereas sustainable development is a process or a series of actions. As a result, it is not particularly acceptable to use them as synonyms.

5. Definition of "urban sustainability"

Based on the discussion above the author proposes the following definition of sustainable urban development – "the method of progress that implies ideas and tools that are implemented by urban planning to improve and/or construct cities without permanently depleting their natural resources while enhancing the standard of living in a city across several dimensions (environmental, cultural, political, institutional, social, and economic) for current and future generations".

This definition is derived from a combination of the keywords urban, sustainability and development. Urban, then, refers to the land immediately next to and including a city. Dense human constructions, including homes, businesses, roads, bridges, and trains, characterise highly developed urban regions. Sustainability is a balance between economic growth, environmental protection, and social well-being so that the demands of both present and future generations are met (Scoones, 2016). In terms of social, environmental, and economic impact, a sustainable urban environment is one that has been planned and managed to minimise negative effects (Sodiq et al., 2019). The development of environmentally friendly replacements is a key component of many sustainability programs. Therefore, it can be seen that the meaning of sustainable urban development revolves around the balancing of the resources in cities without compromising the needs of future generations.

Meanwhile, the term "urban sustainability" can be defined as "a state in which the major subsystems of a city (economic, social, physical, and environmental) work in harmony to ensure the long-term well-being of its inhabitants and the preservation of the natural resources on which the city's growth and prosperity rely".

Conclusions

In this study, the terms "urban sustainability" and "sustainable urban development" have been defined in a clear, succinct manner after being rigorously examined. The paper clarified the ambiguity around these terms and their usage in academic and scientific publications through a thorough assessment of the literature and the use of the PRISMA approach.

From the conducted analysis it can be deduced that urban sustainability refers to a city's state of being planned, built, and maintained in a way that promotes the long-term health and wellness of its residents and the environment, as well as economic and social justice. This state's qualities include the preservation of natural resources, a reduction in greenhouse gas emissions, an improvement in the quality of the air and water, and the creation of liveable, walkable, and accessible regions for all community members. Urban sustainability is the ability of a city to address issues of the twenty-first century, such as population growth, resource depletion, and climate change, while still preserving a high standard of living for its residents.

The study does, however, have certain limitations. The analysis only considered papers written in English, potentially ignoring important contributions written in other languages. Therefore, future research directions could involve broadening the analysis to incorporate non-English sources. Additionally, examining how the suggested definitions will actually be used in urban planning and governance may shed light on how well they will work in actual situations.

Defining "urban sustainability" and "sustainable urban development" is crucial for the recognition and overcoming of the difficulties that urban areas face in their pursuit of a sustainable future.

Disclosure statement

Authors do not have any competing financial, professional, or personal interests from other parties.

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