

Towards the Sustainable Urban Development Goal: A Review of Evaluation Tools

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Abstract

Good policies on sustainable urban development always focus on the people who live in cities. Decisions related to urban planning, governance, and finance can generate or exacerbate health risks, or they can foster healthier environments that reduce the risk of diseases. The shape and form of sustainable urban development infrastructure centres living communities and impacts the health of citizens; it can mitigate risks and promote the well-being of the urban population. At a time when falling revenues threaten public budgets, local spending continues to rise as local authorities are given increasing responsibility. The aim of the article is to identify and follow the city's evaluation tools, such as SR 37120, in an effort to monitor the success and impact of sustainability interventions, evaluating, measuring, diagnosing problems and pressures in cities, and therefore identifying areas that would benefit from good governance and science-based answers toward a sustainable urban development.

Keywords: public authorities, sustainability, urban development, health, indicators, assessment tools, citizens.

INTRODUCTION

Urbanization is defined by the United Nations as the movement of people from rural to urban areas, as a desirable state or set of urban conditions that persists over time (Adinyira et al., 2007). Across Europe, cities have been at the center of change throughout history, from the spread of Greek and Roman civilizations during the Italian Renaissance to the Industrial Revolution in the United Kingdom,

(Kotzeva & Brandmuller, 2016; Draghici et al., 2022). Thus, Europe slowly transformed from a largely rural, agricultural community, into a large urban community as more than half of the European population lived in an urban area by 1950 (also confirmed by the statistical data provided by the Organization of Nations United in 2018). This was also the case for North America and Oceania. On the other hand, more than 80% of people living in Africa and Asia in 1950 lived in rural areas. While the rhythm of urbanization on these two continents subsequently accelerated, in 2015 the majority of their populations from Africa (59.6%) and Asia (51.8%), continued to live in rural areas. It is worth noting that almost three quarters of the European population lived in an urban area in 2015, while even higher proportions were recorded in Latin America and the Caribbean (79.8%) and North America (81.6 %). These different levels of urbanization show that globally, only in the last decade has the total number of people living in urban areas exceeded that of people living in rural areas (Kotzeva & Brandmuller, 2016).

The same research mentions that the spatial distribution of cities varies considerably: Europe is generally characterised by a large number of relatively small towns and cities, which are distributed in a polycentric way; this reflects, to some extent, its historical past, which has led to a fragmented pattern of about 50 countries spread across the continent. In contrast, in parts of Asia and North America, a relatively large proportion of the urban population is concentrated in a small number of very large cities. (Kotzeva & Brandmuller, 2016). Developing countries implement urbanization as a national strategy for economic development, especially to pursue a balanced development between urban and rural areas. However, people continue to move to cities in search of better lives and economic opportunities. As a result, sustainable urbanization practices play an important role in achieving global sustainable targets. Decision makers who plan, build, and govern cities exercise a great influence on the basic conditions of a healthy life, such as access to decent housing, clean air and water, nutritious food, smart transport, and sustainable urban mobility, opportunities for physical activity, and protection from toxic pollutants. These fundamental links were addressed in the Third United Nations Conference on Housing and Sustainable Urban Development, Habitat III, when a new agenda for the next 20 years of urban development emerged, Habitat III (2016). If previous Habitat conferences did not address a special attention to the dependence between health and sustainable urban development, The New Urban Agenda stressed that health is not only about the provision of health care services, but also it is about how the shape and form of urban development influences the health of city residents. Local administrations that offer health-enabling environments and coordinated support for their citizens can also guarantee healthy lifestyles and ensure a balanced economy (Caprotti et al., 2017).

Health is the most valuable asset of a sustainable city. Healthy cities are sustainable and resilient in terms of environment. It is a well-known fact that to provide inhabitants with a good quality of life, governments face greater challenges. The urbanization process toward a desired urban sustainable development is built following a documented plan, a well-written integrated urban strategy. The main elements to communicate how successful public policies and urban strategies have been are sustainable urban indicators. Clean air, energy-efficient infrastructure, and green spaces in cities can attract more investment. and businesses, create more jobs and offer more opportunities to people of all ages. In order to understand the relationship between urban areas and better performance in terms of urban sustainability, sets of indicators, frameworks, and assessment tools have been developed (Briassoulis, 2001). It has been proven that urban sustainability indicators are essential to help set targets, conduct assessments, and facilitate communication between policy makers, experts , and citizens (Verbruggen & Kuik, 1991). Therefore, in the diversity of cities and regions, a wide range of indicators of urban sustainability are used, depending on their needs and specific objectives (Brandon & Lombardi, 2005;

Verbruggen & Kuik, 1991). However, practical challenges have showed mixed results in applying sustainability indicators in different environments, which consequently, sustainability performance sometimes improves slightly (Seabrooke et al. 2004). They vary due to the inadequate selection of indicators for the sustainable urbanisation process. It has been argued that one of the main reasons for not reaching the desired performance is the lack of indicators to guide and monitor sustainable urbanisation processes (Briassoulis, 2001). The paper aims not only to show a selection of different methods/tools, but also show the need for a consistent process of selecting indicators based on standards obtained from best practices (Shen et al., 2011). Transformation of sustainable pathways does not simply mean expanding sustainable initiatives. It consists of dealing with these to change the structure of the legal, political, economic, and other social systems aiming to enable leaders in government, academia, and all the interested stakeholders to spark transformative changes towards a more just, healthy, and sustainable world. Therefore, the selection of indicators must be carried out with a clear understanding of the requirements in which they will be applied. We also agree with the widely held opinion that the most current assessment of urban sustainability methods often does not demonstrate a sufficient understanding of the interdependencies of social, economic, and environmental aspects. Furthermore, the various sustainability methods point out the huge gaps between theories of assessment and practices of assessment (Adinyira et al., 2007). Sustainability indicators are seen as an essential component in the general assessment of progress toward sustainable urban development. They are useful in monitoring and measuring environmental conditions by taking into account a number of variables or manageable characteristics (McLaren & Simonovic, 1999; Ameen & Mourshed, 2019).

A REVIEW OF THE EXISTING SUSTAINABLE URBAN DEVELOPMENT ASSESSMENT METHODOLOGIES

Many methods for assessing urban sustainability can be identified from literature, and date back from the Pre-Brundtland era to nowadays. Reviews of urban sustainability assessment techniques conducted using the built environment quality assessment for sustainability through time framework reveal several methods available for sustainability assessment of urban activities (Deakin et al., 2002). However, a close study of existing assessment methods indicates, in particular, three groups of methods that are classified based on their methodological basis. These are namely: “environmental in general” methods, Life cycle assessment (LCA) methods, and sustainability indicator assessment methods.

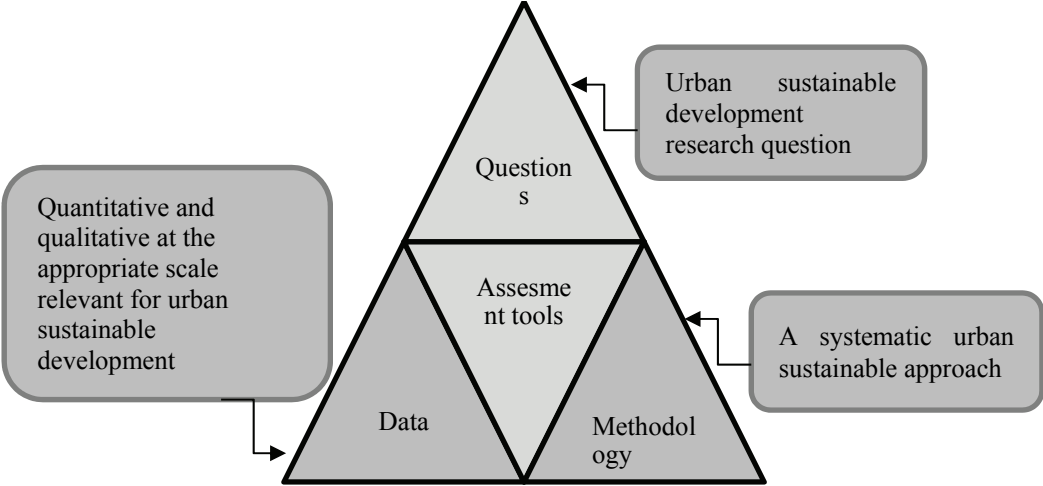
Table 1: Methods classified on their methodological basis

No	Method	Description
1	Environmental in general method	Dates back to the pre-Brundtland era when sustainability focused on environmental issues (consumption, pollution).
2	Life cycle assessment	Dates after Agenda 21, a shift of focus from environmental assessment to life cycle assessment
3	Sustainability indicator assessment methods	A wide range of indicators characterising different aspects and dimensions of urban development.

Sustainability assessment methods based on environmental assessment used methods such as checklists or matrices and evaluations. It was done using logical frameworks, cost-effective analysis, and multicriteria evaluation, but in view of the rather minimal coverage of urban development activities by »environment in general« methods of assessing urban sustainability have lost their novelty (Brandon et al., 1997). Life cycle assessment (LCA) methods can be traced to after the Agenda 21’s. The attention

was shifted to the development of methods. from environmental assessment to life cycle assessment. LCA methods that seek to address broader sustainability issues, such as environmental limitations, concerns about social justice, and the need for participation of stakeholders, were based on structured methodologies to evaluate the impacts of urban development on the entire life cycle. The Sustainable Development Indicator Assessment Method uses a wide range of indicators to characterise different dimensions and aspects of urban development. Under the sustainability assessment, people can track their progress towards sustainability. Sustainability indicators are considered an essential element in assessing progress in sustainable development. They are useful in monitoring and measuring environmental conditions by considering a number of controllable variables or characteristics (McLaren & Simonovic, 1999). These tools are available for implementation by all interested stakeholders and include aspects of sustainable development beyond environmental dimensions such as public health and services, governance, income, business opportunities, and transport. The challenge for urban authorities is to decide which tool best addresses the needs and objectives of a particular city, which would be easy to implement and which justifies the financial and human effort in some cases, as shown in Figure 1.

Figure 1: An Approach to Sustainable Urban Development Assessment



Source: Authors own development.

The selection of different tools may be desirable for a city with a small population; in other instances, a large city may wish to join a global indicator programme already determined. Urban sustainability indicators, such as the SR 3712 family (Figure 2), provide the simple and measurable evidence needed to create and maintain cities that are not only green, but promote long-term economic productivity and the health and well-being of their citizens. Furthermore, all monitoring activities aim to fill data gaps, improve data flow, and provide an integrated data base to monitor sustainable urban development.

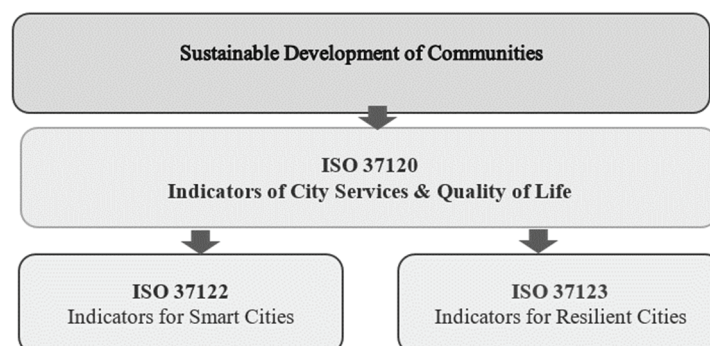
Table2: Indicator Frameworks and Tools

#	Framework/Tool	Issued by	Source (URL)
1	The EEA Framework on Urban Metabolism (Minx et al., 2011).	European Environment Agency	https://ideas.climatecon.tu-berlin.de/documents/wpaper/CLIMATECON-2011-01.pdf
2	Assessment Tool for Sustainable Urban Development (European Commission, 2023)	European Commission	https://urban.jrc.ec.europa.eu/sat4sud/en

3	Sendai Framework for Disaster Risk Reduction 2015 – 2030, (U.N., 2015).	United Nations	https://www.preventionweb.net/files/43291_sendaiframeworkfordrren.pdf
4	Indicators for Sustainability	International Sustainable Cities	https://sustainablecities.net/
5	Urban audit statistics, coordinated by Eurostat ('European Commission, 2014)	General Directorate of the European Commission	https://ec.europa.eu/eurostat/ramon/statmanuals/files/KS-BD-04-002-EN.pdf
6	European Green Capital Award 'European Commission (2023)'	European Commission	https://environment.ec.europa.eu/index_ro
7	Reference Framework for Sustainable Cities (RFSC, 2023)	RFSC	https://www.mdlpa.ro/uploads/articole/attachments/617a9d1f5b5bb758658478.pdf http://rfsc.eu/ Reference Framework for Sustainable Cities, RFSC
8	Indicators of Urban Sustainability (Eurofund, 2023)	European Foundation for the Improvement of Living and Working Conditions.	https://www.eurofound.europa.eu/data
9	Urban ecosystem Europe - informed cities	International Council for Local Environment Initiative (ICLEI); Ambiente Italia	https://informedcities.eu/home/
10	European Green Leaf Award (European Union, 2023)	European Union	http://ec.europa.eu/environment/europeangencapital/europeangreenleaf

As tools for measuring progress or static diagnostics of »city metabolism« (Wolman, 1965), urban sustainability indicators provide the simple and measurable evidence needed to create and maintain cities that are not only green, but that promote long-term economic productivity, as well as the health and well-being of their citizens. But in order to do that, open government data transparency is a must. In view of global population growth, local authorities face many challenges in providing quality services such as health, education, public mobility, security, pollution, waste disposal, or energy consumption.

Picture 2: Sustainable development of communities – relationship between the family of city indicators



Adapted from (ISO, 2019).

The availability of public information in an open data format not only generates informed citizen decisions, but also a clear diagnostic of sustainable indicators, which brings a city closer to the smart city. Standardised indicator systems (ISO) help cities measure their performance. Every coherent local

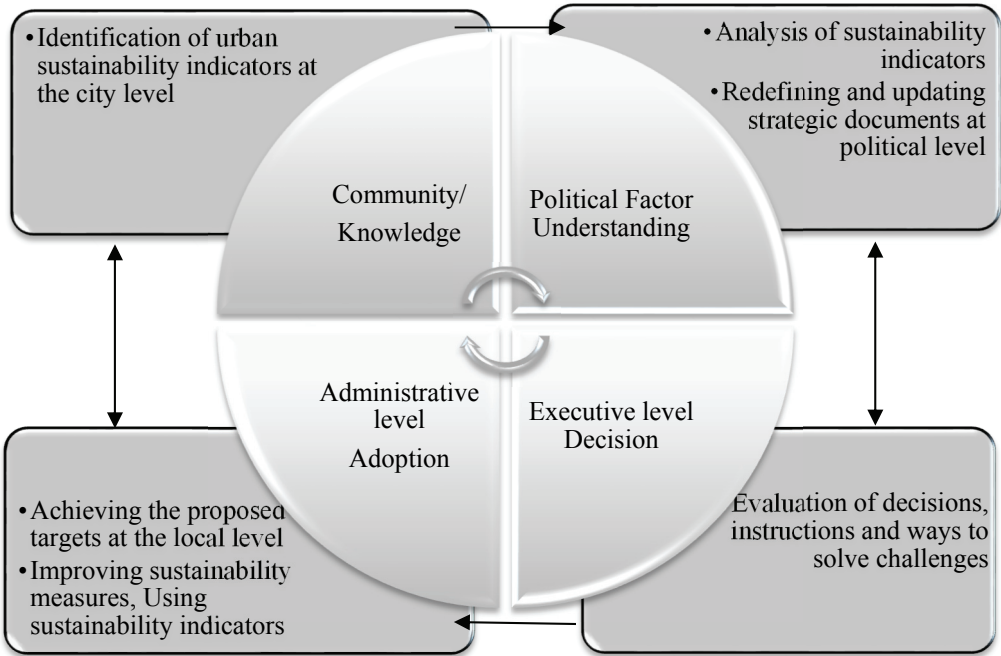
strategy is supported by appropriate indicators. Indicators for city services and quality of life, known as ISO 37120, are the first international standard focused on data at the city level. It was published in 2014 and was revised in 2018 (ISO, 2018). Along with two additional standards: indicators for smart cities ISO 37122, (ISO, 2019) and indicators for resilient cities ISO 37123, (ISO, 2019) form an exhaustive approach on how and what to measure (Figure 2) and are designed to steer and evaluate city management performance in view of real city-level progress towards UN SDGs.

APPROACH AND METHOD

The goal is to develop indicators (and to aggregate them) that demonstrate the progress cities are making towards sustainable urban development and inform supporting policy, planning, and investment. As a first preliminary step in the process, the standard set of indicators should be rooted in existing systems. The characteristics of existing indicator systems must be explored, established if a standard set of sustainable urban development indicators could be drawn or adapted from existing systems. By doing so, a consensus can be reached and the identified challenges and risks can be solved. This study has three aspects: existing expertise, literature review, and analysis of existing systems.

The existing expertise comes from strategic documents that requested the study and set the parameters and frameworks that guide it. Existing literature is also important. There is considerable work on indicators, especially those related to sustainability and sustainable development, and it informs researchers about the understanding of evidence-based measurement systems. Finally, a standard indicator system should be based not only on established research, but also on existing indicators. Therefore, the aim of this study is channeled on examining and organizing the existing indicators and testing their appropriateness in accordance with the prescribed conceptual frameworks.

Picture 3: Integration of Urban Indicators in City Decision-Making Processes



Source: Authors own development.

The introduction of the SR ISO 37120:2020 standard defines a set of indicators for measuring the performance of urban services and quality of life. The identification of urban indicators at the community level and their definition in strategic documents by the political factor offers at the executive

level solutions for reaching the targets assumed and adopted at the administrative level. This process is cyclical.

CONCLUSIONS

An efficient organisation shows a general concern for the sustainable urban development of the smart city from the perspective of innovation and adaptation to environmental changes; of relevant, efficient, secure, community-focused smart services (Banaduc et al., 2022). Many methods for assessing urban sustainability can be identified from literature, and date back from the Pre-Brundtland era to nowadays. Under the sustainability assessment, people can track their progress towards sustainability. Sustainability indicators are considered an essential element in assessing progress in sustainable development. Measuring progress or static diagnostics of a «city metabolism» (Wolman, 1965), urban sustainability indicators can offer the evidence needed to create green, healthy and long-term economic productive cities.

Among the benefits of using these standards, we can list: saving existing resources, reducing pollution, managing energy more efficiently and optimising services, streamlining traffic, attracting investments, etc. In the specialized literature, we have identified several tools created by public authorities, international organisations for the identification, evaluation, and measurement of indicators related to sustainable urban communities. Choosing appropriate indicators for the particularities of each community can be difficult when governance is not informed by science-based policies, effective, or orientated towards the adoption of sustainable solutions. Urban sustainability indicators provide a correct and transparent diagnosis of the community.

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