



Developing Social Sustainability Criteria and Indicators in Urban Planning: A Holistic and Integrated Perspective

Hilay Atalay* 

Nuran Zeren Gülersoy** 

Abstract

One of the main reasons for today's urban problems is the disregarding of social sustainability in urban interventions and the lack of an approach that evaluates social sustainability with all its issues as a universal and holistic one. In this context, the aim of this study is to determine and categorize social sustainability criteria, objectives, and indicators to measure and to assess social sustainability for ensuring the sustainability of cities that could be used in all urban areas and applied in urban planning. Within this scope, social sustainability criteria, objectives, and indicators identified by international organizations and academic/scientific studies on different scales and in urban areas were evaluated systematically and analytically. A matrix has been generated according to the frequency of occurrence of social sustainability criteria and indicators. Although research studies focus on criteria and indicators according to scale, subject, and specified matters. It is a necessity to identify social sustainability criteria and indicators that can be used on every scale and in every urban area. Accordingly, ten criteria have been determined: population, accessibility, education and skills, health, housing, security, belonging, participation, social capital and social cohesion, urban life quality, satisfaction, and adequacy of services. Based on the criteria, targets, sub-targets, indicators, and indicator definitions for each criterion have been identified. However, the significance of each criterion is addressed, as well as the reasons for their necessity for social sustainability. This study proposes a universal, detailed, and holistic perspective for the measurement and assessment of social sustainability that enables the use of both quantitative and qualitative data together and envisages the use of mixed techniques in obtaining and evaluating data. In addition, criteria and indicator systems will be able to guide practitioners and policymakers to make decisions related to the social structure before and after the implementation of urban projects.

Keywords:

Social sustainability, Criteria and indicators of social sustainability, Measurement of social sustainability, Urban sustainability

*City and Regional Planning Doctorate Program, Graduate School, Istanbul Technical University, Istanbul, Türkiye. (Corresponding author)

✉ Email: atalayh@itu.edu.tr

** Professor, Faculty of Art, Design and Architecture, Department of Architecture, Işık University, Istanbul, Türkiye.

✉ Email: zeren.gulersoy@isikun.edu.tr

INTRODUCTION

In the process of change and transformation of cities, the concept of sustainability is being integrated into many fields due to human interventions in all systems, including cities. The sustainability concept in the context of finding solutions to universal problems of the world has become an important issue in many different fields as theoretical and practical principles have developed. Even though the necessity of evaluating the three components of a sustainable society emerged after the 1980s, physical and economic renewal have been concentrated on rehabilitating existing cities to respond to the changing needs of cities (Colantonio and Dixon 2011). By neglecting the social dimension of sustainability in urban interventions, problems such as inequality, inadequacy, and insecurity have occurred in cities, especially in the organization of spaces. However, in an environment where urban interventions are limited due to the physical and economic structure of the cities, there is a necessity to address environmental, economic, and social aspects from a holistic perspective to ensure social sustainability as well as to provide the foundation for creating sustainable cities under changing conditions. In this context, the purpose of this paper is to determine and to categorize the social sustainability criteria, goals, indicators, and its definitions taken into account a holistic approach to ensure the sustainability of cities for measuring and assessing social sustainability that could be applied to urban planning practice.

SOCIAL SUSTAINABILITY IN URBAN PLANNING

Although there is no standard general definition for social sustainability, it is seen that the theoretical framework of the concept varies according to the scale, spatial characteristics, subject matter, and working perspectives studied by the scientists. It is clear that the concept of sustainability has been developed more slowly than other aspects of sustainability because social sustainability is the least interesting dimension of sustainability (Woodcraft, 2011). As a result, the goal of the earliest definitions of social sustainability is to clarify the idea. It is evident that thorough explanations and analyses of the idea have been detailed, particularly since the 2010s.

In the most general sense, social sustainability could be described as "the maintenance and development of the well-being of current and future generations (Chiu, 2003) and the fulfilment of the basic social needs of all societies (Eizenberg and Jabareen, 2017). According to more detailed definitions, social sustainability is referred to an integrated relationship between physical space, humans, and society. Individual activities and the produced environment are discussed, as well as the connections between individual life opportunities and institutional structure (Munzel et al., 2018). Focusing on well-being, maintaining in a similar manner, and developing desirable living spaces and working areas highlight the social aspect of sustainability as a growth target that extends beyond economic understanding (Munzel et al., 2018). Some

approaches focus on equality, diversity, and ensuring welfare when defining social sustainability. Barron and Gauntlett (2002) define socially sustainable societies as having an equitable, diverse, connected, self-governing, and good quality of life. The key concept is expressed as the equal access of all residents to resources and fair opportunities for well-being (Murphy, 2012). Equal access and equality should be provided to all basic services such as health, education, transportation, housing, and recreation (McKenzie, 2004). Social sustainability in urban areas, which is part of the concept of sustainable development with a more comprehensive and large-scale structure, is not based solely on the planning of pastoral public spaces that provide humanistic, anthropical, and environmental quality and promote sociality by creating a holistic and accessible social environment (Goosen and Cilliers, 2020).

Traditional approaches associate social sustainability with issues such as employment, social equality, and justice; softer and less concrete issues such as social cohesion and integration, sense of place, and quality of life are starting to be emphasized in the interpretation as the theoretical infrastructure of the concept development (Yifachel and Hedgcock, 1993). While Polese and Stren (2000) define social sustainability as the development and/or growth of a city that supports an environment that is compatible with the regular development of civil society and that enables culturally and socially different groups to live together, they also provide a more comprehensive definition of social integration as a concept that encourages improvements in quality of life. To ensure social sustainability, Chiu (2003) highlights the need to preserve social cohesion and minimize social polarization and exclusion.

As the concept of social sustainability has begun to be emphasized, the issues shaping the concept have begun to differ. In addition to approaches that evaluate the concept from different perspectives, some approaches evaluate the concept holistically and in a multi-layered way. In this context, social sustainability and concepts such as health, participation, needs, social capital, economy, ecology, and, recently, happiness, which is based on the basic values of equality and democracy, are blended with principles such as well-being and quality of life (Cuthill, 2010). All of these principles (social equality, social inclusion, awareness, and the realization of social capital) are all associated with the concept of urban social sustainability, which emphasizes that social sustainability creates synergy with social acceptability (Bramley and Power, 2009). Similarly, the concept emphasizes social cohesion, the necessity to oppose social exclusion and discrimination, and the encouragement of public participation in public affairs.

In its simplest definition, social sustainability means that the environment and its components provide equivalent, equitable, and fair living circumstances for all members of society. Social sustainability is defined as a system that is based on the fundamental values of equality

and justice, where population distribution and economic well-being is well- balanced; equal access to basic services such as health, housing, and security are provided, and opportunities for individual/social development; individuals have a sense of belonging to the environment and society in which they reside; public participation in management is encouraged; social capital and social cohesion are arranged, and the quality of life is sufficient.

CRITERIA AND INDICATORS USED IN THE MEASUREMENT AND EVALUATION OF SOCIAL SUSTAINABILITY

There are many different studies and research generated by international organizations and research on measuring and assessing whether social sustainability is achieved and also how it will be achieved. Within the scope of this paper, studies and reports of international organizations, books, scientific articles, and project reports have been examined in the literature review regarding the measurement, evaluation of sustainability, and social sustainability in particular. In this context, previous research to examine the criteria, indicators, and assessment methods used to measure social sustainability has been evaluated and divided into two different groups: the research of scientific and international organizations.

To assess social sustainability criteria and indicators, scientific research was examined through databases terms such as "social dimension of sustainability in urban design," "social sustainability," "issues, criteria, and indicators of social sustainability," and "measuring social sustainability." Studies that are relevant to this article's aim, scope, and objectives have been reviewed and discussed. Fourteen scientific research of varying quality that identifies the key elements of the idea, evaluate the concept with its subsystems and contain implementations in the case studies have been selected from all reviewed ones. It is important to note that researches conducted between 2002 and 2018 have different typologies, both geographically and in scale, as well as in terms of the study subject and evaluation method.

Moreover, 9 articles, 2 project reports, 2 papers, and 1 book were among the 14 studies considered in the in-depth review. And 5 studies were chosen from Europe (3 from the United Kingdom, 1 from Finland, and 1 from Germany), 5 from Asia (China, Hong Kong, Jordan, Israel, and Cyprus), and 4 from Australia. However, the studies were chosen from a variety of scales, including national (1), regional (1), urban (1), district-neighbourhood (7), building scale (1), and unknown scale (3). It is important to point out that 7 studies (Omann and Spangenberg 2002, Baron and Guantlett 2002, McKenzie 2004, Cuthill 2010, Dempsey et al 2011, Khan, 2016, Eizenberg and Yosef Jabareen 2017) focus on social sustainability issues and indicators but do not use social sustainability indicators in the sample areas. In the other 7 studies that used exemplary case studies (Chan&lee 2007, Mak and Peacock 2011, Yung et

al, 2011, Colantonio & Dixon 2011, Woodcraft, 2012, Abed, 2016, Atanda 2018), social sustainability indicators were constructed and described based on the case study characteristics.

It has been determined that the studies conducted up until 2010 were mostly focused on conveying the conceptual framework of social sustainability and did not include implementation studies. The criteria used to measure social sustainability, as seen in research undertaken between 2000 and 2010 [Omann and Spangenberg (2002), Baron and Guantlett (2002), McKenzie (2004), Chan & Lee (2007), and others] focus on key elements such as meeting basic needs, equality/equal opportunities, diversity, security, justice, well-being, cultural relations, participation, social awareness, and quality of life.

In exemplary case studies, social sustainability criteria and indicators are varied and defined depending on the scale and original characteristics of the area or project. And the studies conducted between 2010 and 2018 [Cuthill (2010), Mak and Peacock (2011), Yung Chan, Xu (2011), Dempsey, Bramley, Power, Brown (2011), Colantonio & Dixon (2011), Woodcraft (2012), Abed (2016), Khan (2016), Eizenberg and Yosef Jabareen (2017), Atanda (2018)] focus on criteria such as basic needs, quality of life, wellbeing, demographic change, employment, access, education and skills, health, safety, housing and environmental health, satisfaction, sense of place, belonging, cultural identity and collective memory, image and heritage, local culture, diversity, social capital, social infrastructure, social justice and equality, social cohesion, social inclusion, societal sustainability, and behavioural changes are all taken into consideration.

According to the examination of these scientific research conducted between 2002 and 2018, it has been seen that equality/justice, accessibility/meeting basic needs, quality of life, well-being, demographic change, employment, education and skills, health, safety, housing and environmental health, satisfaction, sense of place, belonging, cultural identity and collective memory, cultural relations image, and heritage, security, participation, social capital and social cohesion, diversity, social awareness social inclusion have been used as social sustainability criteria. In these examined research studies, it has been seen that interviews with specialists or stakeholders involved in the project and surveys of local residents have been used as data collection methods in the case studies. Meantime, it has been found out that different evaluation methods such as scoring systems, factor analysis, frequency evaluation, and analytic hierarchical processes were used in case studies in the 14 scientific studies examined.

The work of international organizations such as the United Nations (UN), the Organization for Economic Development and Co-operation (OECD), the World Health Organization (WHO), the European Commission (EUROSTAT), and the European Union (EU) has been studied to examine and to evaluate the criteria/issues and indicators used by international organizations to measure social sustainability.

Within this framework, although there are common or similar social sustainability issues used by international organizations, social sustainability indicators vary according to the objectives and policies of the organizations. The UN, the OECD, and the WHO, which work on a national scale, have examined high-scale issues such as equality, health, education, housing, security, population, sufficiency, poverty prevention, and the labour market (UN, 2001; UN 2007; OECD, 2011; WHO, 1999). The European Commission has examined social sustainability at a more local/urban level in its studies (EC, 2003). According to these reports, it has been observed that they address issues such as employment opportunities, the satisfaction of the local community and citizens, provision/availability of local public spaces, and services, children's journeys to and from school, accessibility to basic services, personal security level, socio-economic development, social inclusion, demographic change, public health, and good governance (UN, 2001; UN 2007; OECD, 200; OECD, 2011; WHO, 1999; EUROSTAT, 2013).

Within the scope of the Sustainable Development Indicators determined by the OECD in 2000, were used to measure the sustainability of the social structure and evaluated on a country scale. The OECD (2011) developed the indicators of social justice to ensure social justice. On the other hand, The WHO (1999) determined the environmental health indicators, including the social aspect of sustainability, on a national scale in its study on sustainable development and healthy environments. To measure the change in the sustainable development indicators between the European Union and member states over the years, the social indicators were examined among the indicators developed by the European Commission in 2003 to measure the local sustainability profile. In addition, separate sustainability indicators have been set for the City of Oslo (EC, 2003).

The criteria and indicators used to measure and evaluate social sustainability vary depending on the study approach, the country's planning system, the scale, planning approaches, whether sample application work has been done, the characteristics of the project area or the implementation area, as well as the data collection method. Although, the indicators used by both academic studies and international organizations to measure social sustainability are different from each other in terms of scale, purpose, policy, and data acquisition methods. It is noted that the social sustainability criteria/subjects are largely similar. In this context, demographics, population, equality, health, education, access, housing, satisfaction, quality, basic services, security, social cohesion, and social inclusion have been identified as common social sustainability issues in both study typologies.

CRITERIA AND INDICATORS SYSTEM FOR MEASURING AND ASSESSING SOCIAL SUSTAINABILITY

The main purpose of this criteria and indicator system is to measure and assess social sustainability. In order to achieve this goal, an

evaluation system to ensure social sustainability by taking a holistic approach to spatial change and development has been developed. In this context, the system defines the basic issues and criteria of social sustainability, the objectives for the provision of social sustainability, and the indicators that enable us to measure and evaluate these goals. The system has been developed to be applicable to all urban areas and at all urban scales. The indicators may vary according to the characteristics, spatial dynamics, and scale of the application area. The system scale and scope to be evaluated have been determined as the district/neighbourhood unit in this study.

The determination of social sustainability criteria and indicators is a part of the more comprehensive research called the model of assessing and measuring social sustainability. This model has an eight-step process. To establish the criteria and indicator system, initially, social sustainability criteria have been determined. And in the second step, social sustainability targets have been established. In the third step, social sustainability indicators, which are the means of measuring social sustainability, have been defined. The methods for obtaining the data that will form the indicators in the implementation area have been defined, and then the methods for evaluating the data have been decided. In the next step, social sustainability is measured by obtaining data from the selected implementation area. And in the last stage, by measuring social sustainability, it has been determined whether social sustainability can be achieved or not, and an interpretation of the results and relations has been made (Figure 1).

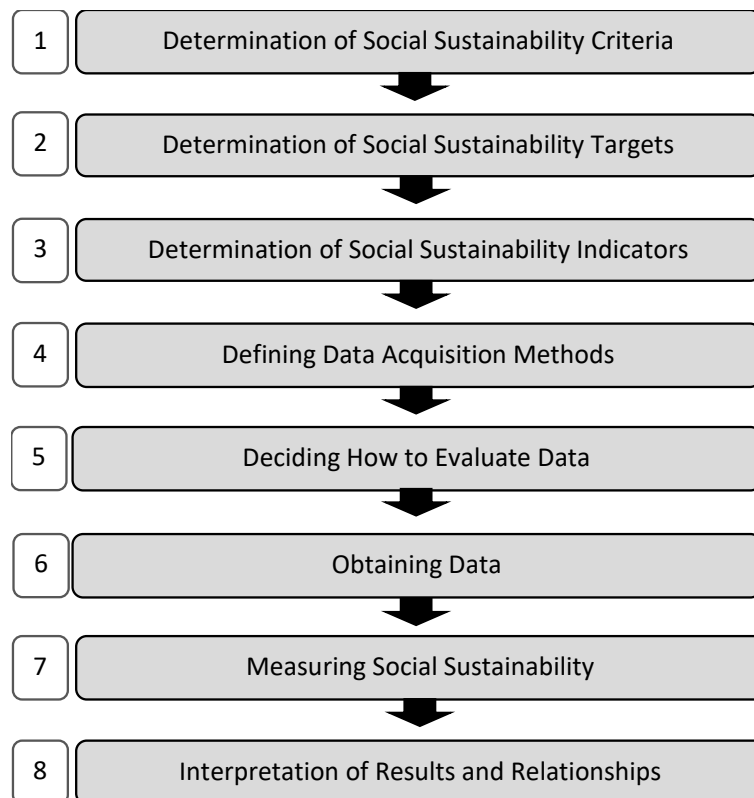


Figure 1. Flowchart for measuring and evaluating the social sustainability.

Criteria, Objectives, Indicators, and Indicator Definitions of the Social Sustainability

The criteria have been determined by considering the synthesis of the literature review, which is explained in chapter 3, the environmental and economic dimensions of sustainability, and the intersection of these issues with social sustainability. Each study evaluated in the literature review has been examined according to its criteria, and the criteria and indicators have been synthesized by creating a matrix including all of them. This matrix was utilized for selecting social sustainability criteria and indicators according to the repetition and frequency of the criteria and indicators, taking into consideration the spatial planning system. According to this matrix, the 10 criteria that form the top headings of the proposed/created indicator system for measuring and evaluating social sustainability have been determined as follows: Population, Accessibility, Education and Skills, Health, Housing, Security, Belonging, Participation, Social Capital, and Social Cohesion, Urban life quality Satisfaction, and Adequacy of Services (Figure 2).

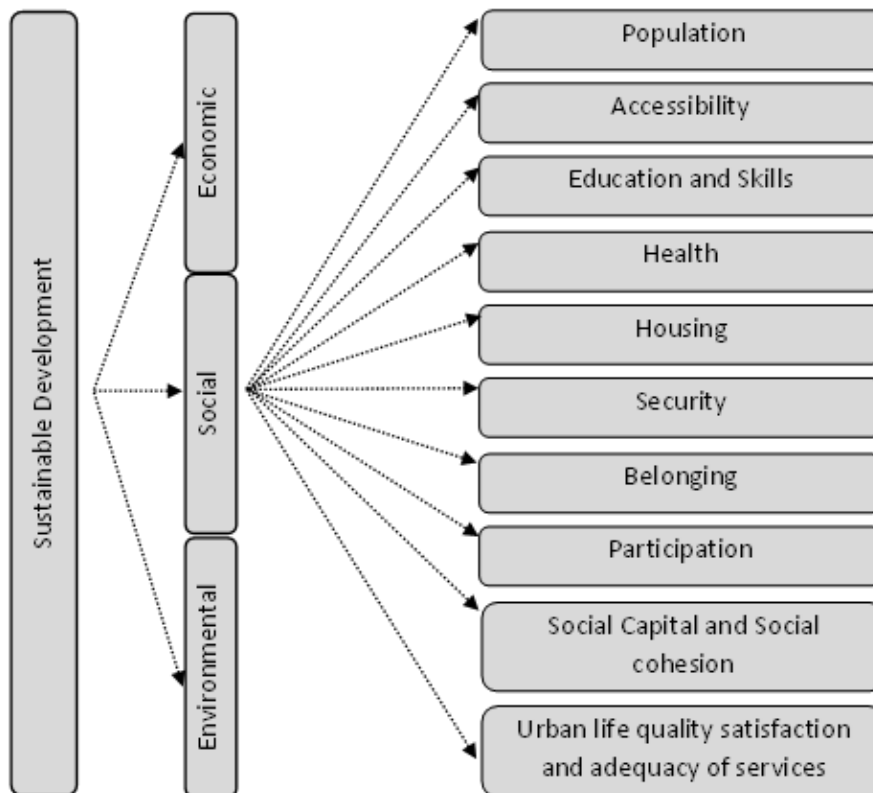


Figure 2. The criteria for measuring and evaluating the social sustainability.

Although the criteria describing the main system of social sustainability have been examined in certain headings, they have been evaluated holistically during the evaluation phase. If the components of urban space are inseparable and form a coherent, holistic structure, the basic elements that affect and create the urban space are also entire. In this respect, the principles of equality and justice, which are the basic principles of the social sustainability concept, are evaluated holistically

within all the criteria since they are related to and include all the criteria. To evaluate whether social sustainability has been achieved or not, and also to make planning decisions to ensure it, answers are being sought to questions about the subjects that constitute the conceptual framework of social sustainability. These questions, for which answers are being found, correspond to the social sustainability criteria, and they provide guidance in reaching the goal in the process of measuring and evaluating social sustainability.

Indicators and indicator definitions have been determined to test and measure whether the targets and sub-targets that are the requirements of each social sustainability criteria have been achieved or not. Indicator definitions are used to specify the data that will be used to measure the indicators. For each criterion, tables with definitions of the main target, sub-target, indicator, and indicator definitions have been developed. The main target and sub-targets of the criterion are symbolized by (TA), and indicators (I) on the tables for each criterion. Under the heading of 10 criteria in the system, 12 targets consist of 49 indicators that enable the realization of the target/sub-targets together with 25 sub-targets and indicator definitions to measure these indicators.

Population

Several characteristics related to population dynamics, such as change, characteristics of the population, population growth or zero population growth, poverty, and employment status, are the main subjects and indicators of sustainable development, as well as social sustainability. However, it is seen that the population criterion is also correlated with all the other criteria of social sustainability. This criterion is the main element that defines urban spaces of all sizes in their internal dynamic. The unbalanced characteristics of the population pose a risk to the continuity of social sustainability. It is an important requirement to ensure the balanced distribution and economic welfare of the population for human beings, which is the main subject of social sustainability, to use other resources effectively and in a balanced and fair manner. Factors that determine population dynamics, such as spatial distribution of the population, age, gender, employment status, income level, and income equality by gender, are also closely related to social sustainability. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the population criteria are seen in table 1. All indicators of population criteria are measured by household surveys.

Table 1. Population criteria, targets, sub-targets, indicators, and indicator definitions.

TA(1) Ensuring a Balanced Distribution of the Population		
Sub-Targets	Indicators	Indicator Definitions
TA(1.1) Ensuring a Balanced Distribution of the Population by Age Groups	I(1) Level of the distribution of the population by age groups	Distribution level of households by age group

TA(1.2) Ensuring a Balanced Distribution of the Population by Birthplace	I(2) The level of distribution of the population by birthplace	The level of distance from the birthplace of the population to the aging area
TA(2) Ensuring the Balance of the Economic Well-Being of the Population		
Sub-Targets	Indicators	Indicator Definitions
TA(2.1) Poverty Prevention	I(3) Income level distribution of the population	The proportion of the population living below the poverty line
		The proportion of the population with a monthly income below the minimum wage
TA(2.2) Provision of Employment Opportunities	I(4) The level of employment of the population	Unemployment rate
		The proportion of the working population
		The proportion of the working population over 65
TA(2.3) Ensuring Productivity in Employment	I(5) The level of productivity of employment	The proportion of long-term employees
		The proportion of low-skilled occupations (such as labour)
		Percentage of Medium-High Skilled Occupations (Such as Management)
		The proportion of independent jobs
TA(2.4) Ensuring Gender Equality in Employment Opportunities	I(6) Gender equality level in employment opportunities	The ratio of the number of female employees to the number of male employees
		The ratio of average women's wages to male wages
		The ratio of the number of unemployed women to the number of unemployed men

Accessibility

Providing equality of access to basic services is an important requirement to ensure the social sustainability of both urban spaces and communities. Although accessibility is seen as a level of physical accessibility to urban services in a spatial context, it allows individuals to create social interactions and networks within society and to access information, services, and basic needs. However, it also plays an active role in obtaining social justice, improving the quality of life, and the development and transformation of society. The effectiveness of an approach in which the interventions made under the name of improvement in urban areas where social infrastructure areas are often inadequate in the current situation is limited to the physical renewal of buildings and poses the risk of restricting the access of all segments of the population to basic services. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the

accessibility criteria are seen in table 2. All indicators of accessibility criteria are measured by spatial analysis.

Table.2 Accessibility criteria, targets, sub-targets, indicators, and indicator definitions.

TB(1) Ensuring Equality of Access to Basic Urban Services		
Sub-Targets	Indicators	Indicator Definitions
TB(1.1) Ensuring Equality of Access to Social Infrastructure, Open Green and Urban Working	I(7) Access level to social infrastructure areas	Level of access to educational facilities
		Level of access to health facilities
		Level of access to cultural facilities
		Level of access to religious centres
	I(8) Level of access to open and green areas	Level of access to green spaces
	I(9) Level of access to the urban working areas	Level of access to government agencies

Education and Skills

It is not enough to meet the physical requirements of a human being to maintain his/her existence in society. Meeting the requirements such as education and skills play an important role in ensuring social development. Improving the educational level thus societies is an important necessity for improving the skills and abilities of individuals and increasing their employability, for them to continue their daily life and social activities, and for ensuring communal and social sustainability. In addition, education is an important element that provides increasing individual and social capacity, learning knowledge and skills, and increasing productivity in present rapidly changing and developing technological conditions. It is overlooked that one of the main reasons for physical destruction, and economic and social collapse in cities requiring spatial intervention is the lack of educational opportunities. To improve the education and abilities of individuals, equal and adequate opportunities should be provided and a structure suitable for all members of society, regardless of the socio-economical-cultural differences of the population. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 3. Indicators of housing criteria are measured by spatial analysis and household surveys. I(10) Literacy level, I(11) Level of education, I(13) Level of participation in vocational courses, and I(14) Level of participation in talent development courses is measured by household surveys. I(12) Spatial adequacy level of educational facilities is measured by spatial analysis.

Table 3. Education and Skills criteria, targets, sub-targets, indicators, and indicator definitions.

TC(1) Individual and Social Education, Raising and Promoting The Level of Development		
Sub-Targets	Indicators	Indicator Definitions
TC(1.1) Raising literacy and education levels	I(10) Literacy level	Adult literacy levels
	I(11) Level of education	Latest graduated school levels
	I(12) Spatial adequacy level of educational facilities	The level of competence of the current situation is according to the standards of educational facilities that should be according to the population
TC(1.2) Promoting Participation in Vocational Education	I(13) Level of participation in vocational courses	Level of participation in existing vocational courses
		Level of participation in case of alternative vocational courses are open
TC(1.3) Promoting Participation in Talent Development Educations	I(14) Level of participation in talent development courses	Level of participation in existing talent development courses
		Level of participation in case of alternative talent development courses are opened
		Level of participation in professional education

Health

Aside from the adequacy of health services, which is one of the most basic needs of individuals and societies, the fact that they are large enough and accessible in proportion to the population size demonstrates the population's degree of development. The continuity of vital and social activities is indicative of the possibility of developing societies composed of physically and mentally healthy individuals with a good quality of life. In this context, it is an important requirement for social sustainability that all individuals from all segments of the population have access to health services without any discrimination. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 4. Indicators of housing criteria are measured by spatial analysis and household surveys. I(15) Spatial adequacy level of health facilities is measured by spatial analysis. I(16) Level of access to healthcare is measured by household surveys.

Table 4. Health criteria, targets, sub-targets, indicators, and indicator definitions.

TD(1) Ensuring the Adequacy of Health Services		
Sub-Targets	Indicators	Indicator Definitions
TD(1.1) Ensuring the Adequacy of Health Services	I(15) Spatial adequacy level of health facilities	The level of adequacy of the current situation is according to the standards of health facilities should be according to the population
	I(16) Level of access to healthcare	The level of access of local people to have health services
		The distance level of the health institution to the area that the local people access when they have health problems

Housing

Housing, which is the most fundamental and crucial activity of an individual, is a human right as well as a constitutional right. The disadvantaged population may face housing challenges as a result of the negative reflection of economic problems on urban space, particularly in developing and underdeveloped countries. When the public interest is overlooked in urban interventions, the failure to address housing needs or inadequate social structure provisions endanger the issue of maintaining the social structure. In terms of legal, humanitarian, urban, and other elements, meeting everyone's housing needs is not only a necessity but also an obligation. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 5. Indicators of housing criteria are measured by spatial analysis and household surveys. I(17) the Property status of the houses and I(18) The level of affordability of rents with household income are measured by household surveys. I(19) Physical condition of the houses is measured by spatial analysis.

Table 5. Housing criteria, targets, sub-targets, indicators, and indicator definitions.

TE(1) Ensuring Housing Conditions for All		
Sub-Targets	Indicators	Indicator Definitions
TE(1.1) Ensuring Increasing Housing Capacity	I(17) Property status of the houses	The ratio of homeownership to tenancy
	I(18) The level of affordability of rents with household income	The ratio of average housing rent to average household income
TE(1.2) Improving the Physical Condition of Housing	I(19) Physical condition of the houses	Building status levels of houses

Security

The safety criterion is a necessary one for maintaining the vital activities of the individual and for ensuring the sustainability of the use of urban living spaces. The creation of safe urban spaces at the personal and social levels is a necessity for ensuring spatial and social sustainability, but it is also a necessity for the creation of social capital

and for cities to be active and liveable spaces. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 6. Indicators of safety criteria are measured by household surveys.

Table 6. Safety criteria, targets, sub-targets, indicators, and indicator definitions.

TF(1) Ensuring Individual Safety		
Sub-Targets	Indicators	Indicator Definitions
TF(1.1) Ensuring Security in Public spaces and Private Areas	I(20) Level of security in housing	Level of feeling safe in residences during the day
		Level of feeling safe in residences at night
	I(21) Level of security in public spaces	Level of feeling safe walking on the road during the day
		Level of feeling safe walking on the road at night
		Level of feeling safe in public spaces during the day
		Level of feeling safe in public spaces at night
	I(22) Level of trust in neighbourly relationships	Level of trust in neighbours

Belonging

People integrate with the spatial and social system as long as they feel a sense of belonging to the place and society in which they live, form bonds, and see themselves as a part of the whole. This integration is an important element of social sustainability for individuals to feel a sense of belonging to the society and the place, to gain awareness about the image of the area, and protect heritage items. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 7. Indicators of belonging criteria are measured by the household surveys.

Table 7. Belonging criteria, targets, sub-targets, indicators, and indicator definitions.

TG(1) Ensuring the Acquisition of Social, Spatial Belonging, Urban Image , and Heritage Values		
Sub-Targets	Indicators	Indicator Definitions
TG(1.1) Ensuring Social and Spatial Belonging	I(23) The level of belonging of local people to the society they live in	The level of local people's feeling like part of society
	I(24) The level of the local people's sense of	The level of life expectancy in the area

	belonging to the area where they live	The level of feeling of belonging to the place they live
TG(1.2) Creation of Urban Image Awareness	I(25) Awareness level of local people about the changing conditions of the area	The level of desire for the area to improve its urban image
		The level of thinking that the urban image of the area has improved with the project
TG(1.3) Creating Awareness of Conservation of Heritage Values	I(26) Level of activities that contribute to the conservation of heritage values	Level of awareness of activities related to the protection of natural heritage in the area of living

Participation

Participation of the public and stakeholders in the country's administration, city management, and planning processes is an important tool for a democratic, egalitarian, and fair management and implementation system in the national, urban, and local contexts. The inclusion of users and other stakeholders living in the area in the analysis, synthesis, and solution proposals of the problems, especially experienced in the destroyed urban areas, is an important factor in both directing the spatial transformation in line with the needs and wishes of the local people and ensuring spatial sustainability. In urban policies where local users are often ignored in areas that require spatial intervention, it is one of the basic principles that will ensure social sustainability that the public has a say in the decisions to be taken regarding both social issues and the area they live in and that they are informed openly and transparently. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 8. Indicators of participation criteria are measured by household surveys

Table 8. Participation criteria, targets, sub-targets, indicators, and indicator definitions.

TH(1) Promoting Public Participation in Management, Planning Processes, and Works Related to Municipal Services		
Sub-Targets	Indicators	Indicator Definitions
TH(1.1) Ensuring Participation in Country and Local Government	I(27) Level of participation in the country's administration	Level of participation of local people in general elections
	I(28) Level of participation in local government	Level of participation of local people in local elections
TH(1.2) Ensuring Public Participation in the Planning Process	I(29) Level of public participation in the project design process	Level of participation of local people in the project design process
	I(30) Level of public participation in the completion of the final project	Level of participation of local people in the completion of projects

	I(31) Level of public participation in the monitoring process of the project	Level of participation of local people in monitoring of projects The level of ability of local people to influence the decisions made in the area where they live
TH(1.3) Ensuring Transparency in Works Related to Municipal Services	I(32) Level of knowledge of local people about municipal works	Level of informing the local people about the municipal work

Social capital and social cohesion

While social capital and social cohesion could be defined as the ability of people to live together in a strict sense, in a broad sense. And it could mean individuals are in harmony and interact with the society in which they live without any discrimination. In today's cities, where the population is growing rapidly, the heterogeneous and multi-layered population structure causes urban segregation as well as social segregation. Differences in the socio-cultural and economic structures of the local population currently living in the area and the new population that later started to live in the area create a risk in terms of coexistence, integration, and interaction in the intervened areas of the cities. This situation affects social development, social interaction, and diversity, and jeopardizes the sustainability of the social structure. With this approach, increasing the level of social development and social interaction becomes an important criterion for ensuring social sustainability. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 9. Indicators of social capital and social cohesion criteria are measured by household surveys

Table 9. Social capital and social cohesion criteria, targets, sub-targets, indicators, and indicator definitions.

TI(1) Ensuring The Level of Social Development and Social Interaction		
Sub-Targets	Indicators	Indicator Definitions
TI(1.1) Increasing Social Development	I(33) Level of participation in information studies	Level of participation in the information studies organized about the area of living
	I (34) Level of participation in social awareness studies	Level of participation in social awareness studies
	I (35) NGO/association membership status	Membership in any association/non-governmental organization
	I(36) Level of participation in social works	Level of voluntary activity in any association/non-governmental organization

		Status of being a member of an association operating in the area of living
		Status of being a member of an association/organization that works on the project
		Level of participation of the members in the activities of the association
TI(1.2) Level of Social Interaction	I(37) Level of interaction in public space	Level of going to public space
		Level of communication with neighbours in public space
	I(38) Level of social interaction by gender	The ratio of men who go to the public space to women who go to the public space
TI(2) Ensuring Diversity and Cultural Integration		
Sub-Targets	Indicators	Indicator Definitions
TI(2.1) Ensuring Cultural Diversity and Cultural Integration	I(39) Level of the interaction of people of different cultural structures	People with different ethnic backgrounds/identities being friends with each other in the living area
		Level of collaboration with people of different ethnic backgrounds/identities

Urban life quality satisfaction and adequacy of services

It is critical for spatial, communal, and social sustainability as well as for people’s well-being and happiness in cities that urban services are sufficient, fair, equal, and balanced for all, that the population is satisfied with the quality of urban life, and that they consider the services adequate. Individual happiness will occur to the extent that the human is satisfied with the urban area in which he/she lives and considers it sufficient. And individual happiness will allow him/her to bond with the area in which he/she lives and to create prosperous societies that are open to progress. The physical dimension of interventions in areas that require spatial intervention, the lack of fair, equal, and adequate urban services for everyone, the dissatisfaction with the quality of life, and the inadequacy of the services put the sustainability of the social structure at risk. In this context, the objectives, sub-targets, indicators, and indicator definitions for the provision of the education and skills criteria are seen in table 10. Indicators of Urban life quality satisfaction and adequacy of services criteria are measured by household surveys.

Table 10. Urban life quality satisfaction and adequacy of services criteria, targets, sub-targets, indicators, and indicator definitions.

TI(1) Ensuring The Level of Social Development and Social Interaction			
Sub-Targets	Indicators	Indicator Definitions	
TI(1.1) Increasing Social Development	I(33) Level of participation in information studies	Level of participation in the information studies organized about the area of living	
	I (34) Level of participation in social awareness studies	Level of participation in social awareness studies	
	I (35) NGO/association membership status	Membership in any association/non-governmental organization	
	I(36) Level of participation in social works		Level of voluntary activity in any association/non-governmental organization
			Status of being a member of an association operating in the area of living
			Status of being a member of an association/organization that works on the project
TI(1.2) Level of Social Interaction	I(37) Level of interaction in public space	Level of going to public space	
		Level of communication with neighbours in public space	
	I(38) Level of social interaction by gender	The ratio of men who go to the public space to women who go to the public space	
TI(2) Ensuring Diversity and Cultural Integration			
Sub-Targets	Indicators	Indicator Definitions	
TI(2.1) Ensuring Cultural Diversity and Cultural Integration	I(39) Level of the interaction of people of different cultural structures	People with different ethnic backgrounds/identities being friends with each other in the living area	
		Level of collaboration with people of different ethnic backgrounds/identities	

Implementation and Evaluation Method for Measurement and Evaluation of Social Sustainability

The system has been proposed as a guiding tool for both decision-makers and stakeholders in ensuring spatial sustainability by going beyond just improving, transforming, and renewing the physical and

environmental structure and incorporating social components into this change process in urban projects, which are seen as one of the basic methods of solving urban problems. The system includes an approach that can be used and implemented both in the process of proposing urban projects and in evaluating the social sustainability of implemented urban projects. In the process of proposing urban projects, the current state of the social structure in the first stage should be measured with the criteria and indicators determined in the system. After the determination of the current situation, social sustainability will be achieved by making decisions about the social structure in the light of the criteria, objectives, and indicators proposed in the system during the proposal phase of the projects. Whether social sustainability is achieved in the implemented urban projects can be measured by the system proposed in the system, and solution proposals or strategies can be developed to ensure social sustainability.

Mixed techniques are used both in the data acquisition and evaluation phases. In the implementation of the system after the sample area is selected, literature research, spatial analysis, in-depth interviews, and survey studies have been determined as the methods that can be used in the process of obtaining the data.

CONCLUSION

Referring to sustainability studies, social sustainability is still largely unexplored and undertheorized. However, the assessment of the literature has revealed that a thorough conception and operationalization of urban social sustainability are still lacking. This study is a part of the more comprehensive research called the model of ensuring and evaluating social sustainability. This study aims to determine criteria and indicators that foresee the development and maintenance of the social structure by going beyond the physical transformation of urban interventions. Therefore, the general principles, targets, and indicators in the integrated system are determined to develop evaluation methods to measure and assess social sustainability.

In this context, in the literature review, studies at different conceptual and practical scales are examined. In previous studies until 2010, social sustainability has been considered and defined from a general perspective. In this context, a general and limited paradigm for social sustainability has been established. Since 2010, research related to measuring and assessing social sustainability has gained more significance and relevance. Previous studies concentrate on defined social sustainability criteria and indicators according to the characteristics of the application area and the content of the projects. For this reason, developed measurement and evaluation systems regarding the concept have been limited in focusing on specific issues however, most of the research in the literature review has not adequately examined social sustainability and its relationship with

other dimensions of sustainability. There are deficiencies in the general, comprehensive, systematic, and holistic evaluation of the concept of the theoretical and practical fields in the literature. In most of the studies, it has been seen that the social sustainability criteria cannot go beyond the components of the social dimension of urban planning, which are determined according to the project subject and are not multidimensional or comprehensive. Therefore, there is a need to identify social sustainability criteria that can be used in every urban space.

However, it has been seen that there is a necessity for a holistic evaluation system, including the evaluations and thoughts of stakeholders, in the evaluation of quantitative and qualitative data. In this respect; conceptually, this study examines social sustainability with all its dimensions from a broad perspective, comprehensively, and holistically. From this point of view, a multi-stage system in which mixed data and mixed assessment methods are used to measure and evaluate social sustainability has been put forward.

In the first stage, the main problem of the study is: "How is social sustainability evaluated in an integrated system?" In light of the question, the criteria that should be used for measuring and evaluating social sustainability have been discussed. Indicators that can be used to measure and evaluate social sustainability may vary according to the scale and characteristics of the application area. However, the criteria to be used for the evaluation, measurement, and provision of social sustainability must be universal and comprehensive. Therefore, all the factors that compose the social structure are taken into account in the social sustainability criteria determined in the system. In this study, the following criteria are set as population, accessibility, education and skills, health, housing, security, belonging, participation, social capital and social cohesion, urban life quality, satisfaction, and adequacy of services. Social sustainability criteria have a quality that can be used in all urban areas. Indicators and indicator definitions are created to measure whether the objectives of the criteria are fulfilled or not are also universal. The most important reason for the physical destruction of urban areas is that the social structure cannot be changed and developed according to present changing and development conditions.

With this system in all urban areas, it is possible to measure the achievement of targets in the context of social sustainability criteria. As a result of measuring each criterion with indicators, the points where the social structure cannot be sustained are determined. The identified issues are a guide to what will be done to ensure social sustainability in both areas that require urban intervention and those exposed to the urban intervention. In other words, this system defines the direction and the subject of the interventions and actions to be taken in urban areas.

This study, which is the guide to leading experts about the interventions made or to be made in cities; presents the phases,

principles, and methods that should be evaluated in order to measure and provide social sustainability in urban space within a system. The proposed system will shed light on the principles, indicators, and implementation processes that could be used in the formation of the system for future studies and in measuring and providing social sustainability in the implementation phase. In addition, this study contributes to filling the gap in the literature with a developed system that includes the intersection points and effects of sustainability dimensions, universal criteria, targets, and indicators applicable to urban spatial systems in a holistic approach.

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Resume

Hilay Atalay is a Ph.D. candidate at Istanbul Technical University. She completed her undergraduate degree in the City and Regional Planning Department and her master's degree in landscape architecture at Istanbul Technical University. She worked for the Bimtaş (Istanbul Metropolitan Municipality) and Okan University. She currently works as a part-time lecturer at Istanbul Gelişim University and Biruni University.

Prof. Nuran Zeren Gülersoy graduated as an architect from Istanbul Technical University (ITU), where she received her master's degree and her doctorate in urban planning. She worked for the ITU between 1977-2018. Presently, she is the Department Head of Architecture at FMV Işık University. Her primary areas of interest are urban conservation, urban planning, and urban and landscape design. She is currently the General Secretary of International Planning History Society (IPHS) and serves as Europa Nostra member, ICOMOS CIVVIH Group and OWH Tourism working group.